



Dairy Report 2011

For a better
understanding of
milk production
world-wide



IFCN
International Farm
Comparison Network

Dear friends,

It is a pleasure for us to summarise the highlights of our research and network activities in 2011.

**The IFCN Strategy 2015**

When looking at the dairy chain as a whole, the majority of costs, resources used, emissions generated and political challenges fall in the milk production segment. That is why the IFCN work is driven by our mission:

We create a better understanding of milk production worldwide

In 2011, we implemented the IFCN board with Anders Fagerberg as chairman.

Status of the network in 2011

A milk production profile was created for 90 countries, representing about 98% of the world's milk production. In the farm comparison **157 typical farms** from **60 dairy regions** (49 countries) were analysed. We are very happy to welcome as new countries for the Farm Comparison work Algeria, Armenia, Iran, Morocco, and Tunisia and as new Country Page partners Azerbaijan, Croatia, Kyrgyzstan and Sudan.

Highlights 2011

IFCN Dairy Conference 2011: With 45 countries participating we have made significant progress in representing world milk production.

IFCN outlook: In a structured approach we have developed an outlook on world milk production 2011 + 2012 and related world milk price scenarios.

Feed: Via the IFCN activity based costing method we can now quantify total feed costs and have found that the share of feed costs on total cost ranges between 45 – 74%.

Farm structure: The standardisation of farm size classes has enabled us to define, on a global basis, the share for household, family and business farms.

Regional milk movement: This report shows the status and the development of milk production for each dairy region in a country. Moreover it shows the regional milk surplus and deficit by world regions.

Top 21 Milk processors: This analysis has defined that the top 21 milk processors – measured by milk intake – process 24 % of world milk.

The IFCN Supporter Conference 2011

This conference was held in Venice Italy, 26th to 28th September with the companies below acting as hosts.

**IFCN Dairy Report 2011**

Chapter 1: Cost comparison: This chapter summarizes results on costs, returns, profitability and productivity of dairy farms worldwide.

Chapter 2: Global monitoring: This chapter gives a broad monitoring on specific dairy issues such as milk prices, feed prices, milk : feed price ratio and also currency exchange rate developments.

Chapter 3: Milk production fact sheets: This profile, prepared for 90 countries, gives a comparable overview related to:

- Milk density within countries
- Dairy farm numbers and farm structure and its development
- Price trends for milk, feed, land, beef, and quota prices

Moreover, the key results are summarised at the beginning of the chapter via maps of the world and Europe.

Chapter 4: Special studies: This chapter summarises special studies on method issues and other important studies performed.

A word of thanks

We would like to extend our heartiest thanks to all our scientific partners, agribusiness partners, our institutional partners and also to the people working in the IFCN Dairy Research Center. It was a pleasure to serve the network in 2011 and we are looking forward to our activities in 2012.

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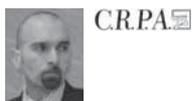
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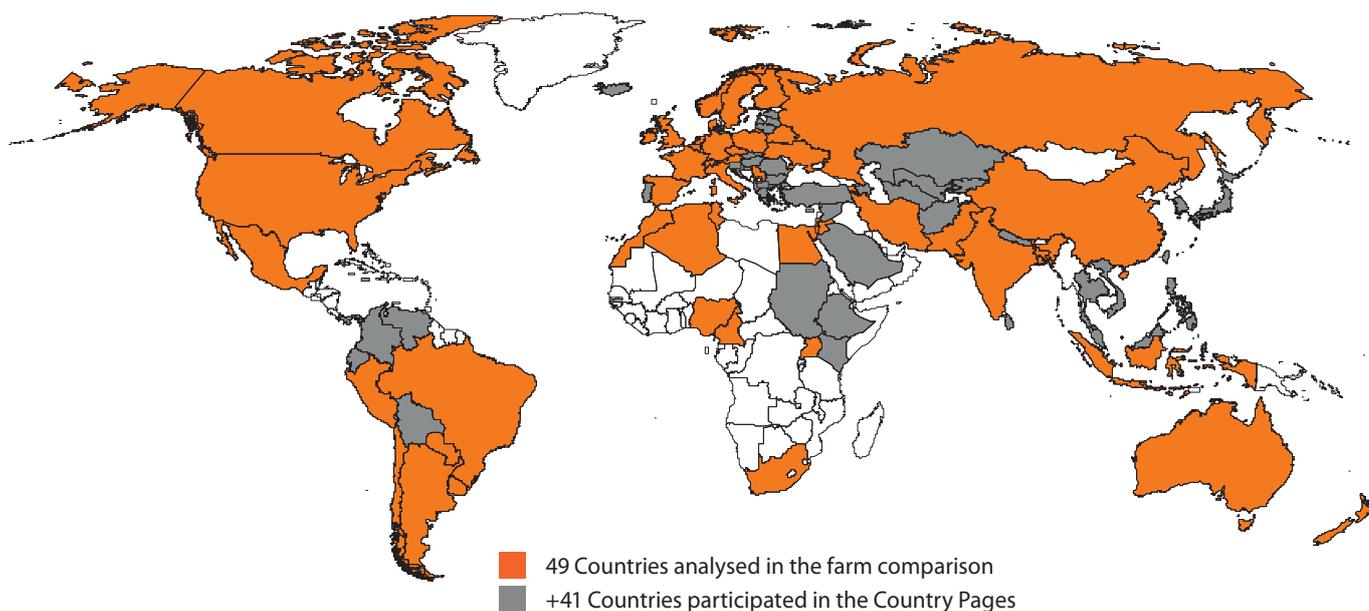
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Institutional partners of the IFCN Dairy Network



Which countries are participating in the IFCN Dairy Report activities in 2011?



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Countries included in farm comparison	8	20	24	27	31	33	34	38	44	46	44	49
country profile analysis	8	20	24	24	31	41	60	73	78	80	86	90
No. of farm types analysed*	21	52	72	76	92	102	103	120	134	147	143	157
Topic of Country Report	Ex-post analysis 1996–2000	Country reports on milk production	Dairy production systems survey	Farm structure analysis 1990-2001	Dairy sector profile 1981-2001	Milk production fact sheet 1996-2003	Dairy sector & chain profile 1990-2004	Milk production fact sheet 1996-2005	Dairy sector & chain profile 1996-2007	Milk production fact sheet 1996-2008	Dairy sector & chain profile 1996-2009	Milk production fact sheet 1996-2010
IFCN Dairy Conferences	Sep-00	Jun-01	May-02	May-03	Jun-04	May-05	May-06	Jun-07	Jun-08	Jun-09	Jun-10	Jun-11

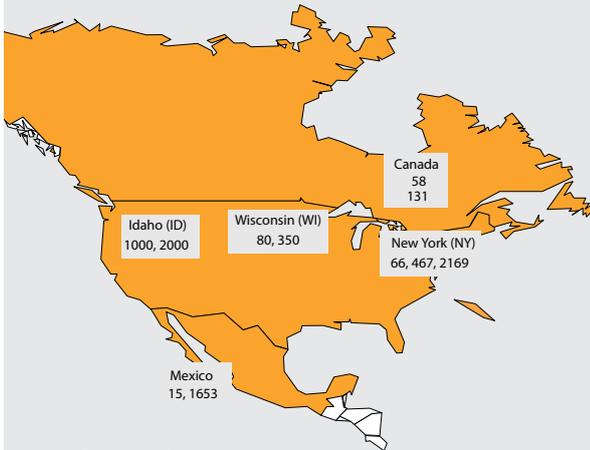
* Farms analysed in Chapter 1 and 4



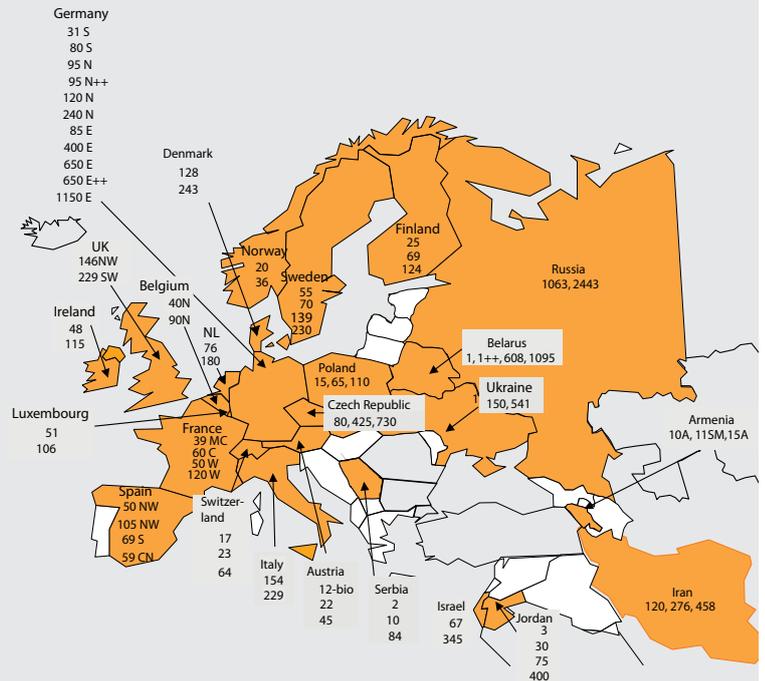
Institutional partners of the IFCN Dairy Network



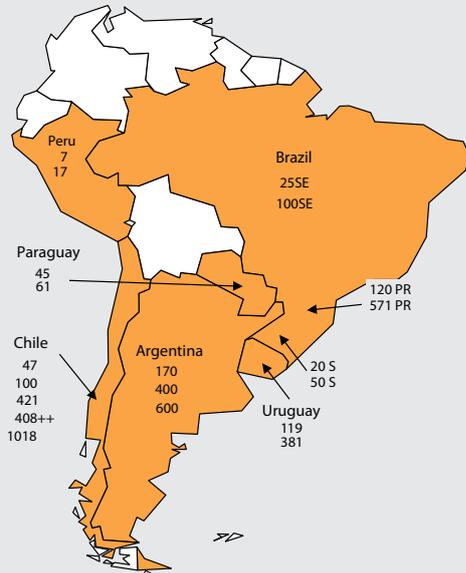
North America



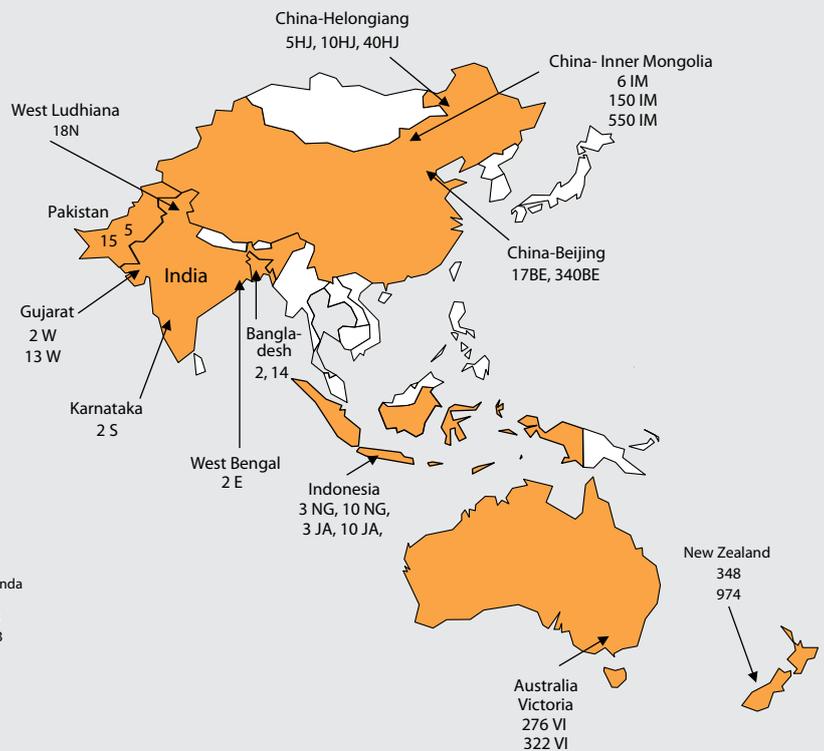
Europe and Middle East



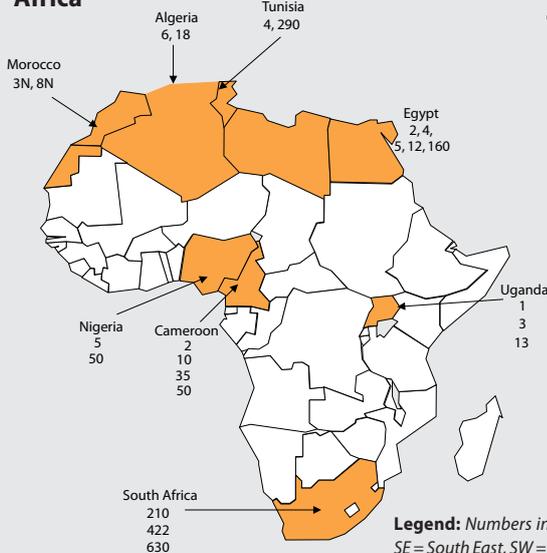
South America



South East Asia and Oceania



Africa



Legend: Numbers indicate the number of cows in the typical farms. N = North, E = East, S = South, W = West, NW = North West, SE = South East, SW = South West, A = Armavir, BE = Beijing, bio = Organic, CE = Center, CN = Central North, ++ = Farms better managed than average, GL = Grassland, HJ = Heilongjiang, ID = Idaho, IM = Inner Mongolia, JA = Jabung, Massiv Central, NG = Ngatang, NY = New York, PR = Parana, SM = Shirak Marz, VI = Victoria, WI = Wisconsin.

What is IFCN?

IFCN stands for International Farm Comparison Network. The dairy branch of the IFCN was founded in 1997.

1. IFCN Vision

We are the leading, global knowledge organization in milk production

2. IFCN Mission

We create a better understanding of milk production worldwide.

3. IFCN identity, competence, values and concept

The IFCN is a global network of dairy researchers related to companies and other stakeholders of the dairy chain.

The IFCN has a Dairy Research Center (DRC) with approx. 10 researchers coordinating the network process and running dairy research activities.

Focus on milk production

In the dairy chain the major share of a) the costs, b) resources used, c) emissions created and d) the political challenges come from producing the milk itself.

That's why the IFCN focuses on milk production and related topics like milk prices, dairy farm economics, etc.

Core competence

The IFCN core competence is in the network of dairy people who have built trust the last 10 years to openly share and discuss dairy issues. This and the annual working process make the IFCN an on-going knowledge creation system.

Core values

The IFCN is independent from third parties and is committed to truth, science and reliability of results.

The IFCN and all its partners commit themselves not to get involved in any discussions or activities that may infringe any applicable competition law.

Why is the IFCN useful for a dairy region?

To have a prospering dairy region, a clear strategy of all stakeholders is required. The participation in IFCN provides information about the global developments of the dairy sector and the competitive position of a dairy region in it. Moreover, it identifies potential points for improvement.

Who benefits from the IFCN work?

1. Dairy farmers

Dairy farmers benefit from knowing about their competitiveness in a globalized dairy world. Moreover, they get access to information about alternative production systems.

2. Milk processors

Information about the production costs in specific milk regions is a key element for the competitiveness of the milk processor.

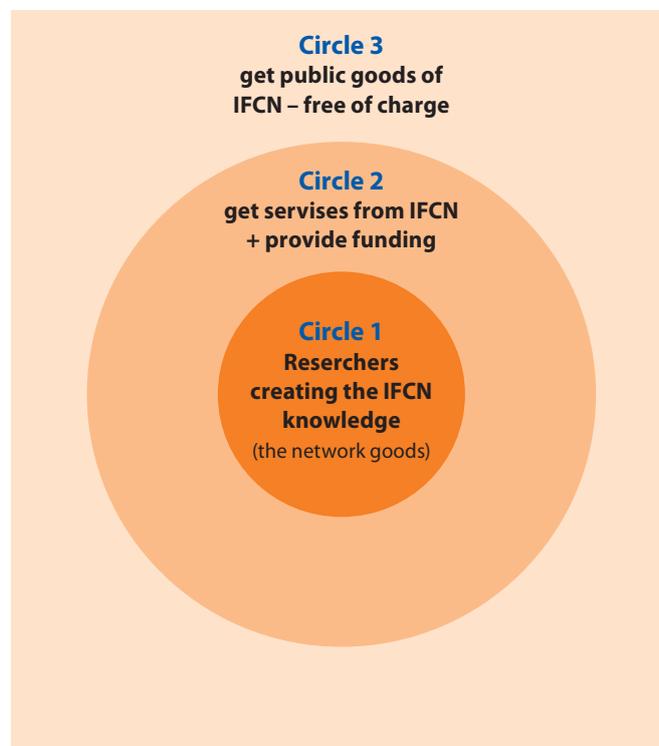
3. Farm input suppliers

Information about farm economics and global dairy developments are very good tools to guide strategic discussion and decisions within the company.

The concept of three circles

The IFCN network concept is based on three circles and the related win-win partnerships.

The 3 circles of IFCN



Circle 1: The participating dairy researchers and the people in the DRC create the IFCN knowledge by sharing and managing information.

Circle 2: Dairy related companies and organisations get services from the IFCN. In return they finance the IFCN activities of the center (DRC) and in the countries.

Circle 3: Part of the IFCN knowledge defined by the DRC can be made available as a public good for the global dairy industry

4. Policy makers

The link with the IFCN knowledge provides the policy makers with facts and figures for political discussions. Moreover, the IFCN tools permit the evaluation of alternative policy scenarios.

5. Research organisations

Cooperation with IFCN offers access to methods, models and data which increases the capacity in dairy research and teaching. Technically, the IFCN provides:

- **Benchmarking:** Analyse your dairy region in a global context.
- **Networking:** Link yourself to the leading network of experts in your research topic.
- **Access to data:** Send in 2 farm types and get the world in return.
- **Promotion:** Promote your institution nationally and internationally.

Partnership with the IFCN network

The IFCN offers different kinds of partnership for the various stakeholders of the dairy chain. For further information please contact us (info@ifcndairy.org)

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Eberhard Bönemann



Elgin Giffhorn



Mareike Meimann



Wiebke Reinecke

Agribusiness partners of the IFCN

Milk processing



Milking and barn equipment



Health and hygiene



Feed



Genetics



Other branches of the dairy chain





China – Inner Mongolia



China - Inner Mongolia



China

China pictures by T. Hemme and J. Steglich.

Chapter 1

Authors: Asaah Ndambi, Johann Steglich, Othman Alqaisi with the contribution from researchers mentioned on page 2-3 of this report

Comparison of the typical farms 2010

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Introduction

In order to “create a better understanding of milk production worldwide”, this chapter gives background information on the farms analysed and also explains farm economics for the analysed year 2010. This year’s analysis covers 157 farms from 60 dairy production regions and 49 countries, accounting for 87% of the total world milk production. The model version TIPI-CAL 5.2 was used, which is a refined version of the TIPI-CAL 5.1, with improved user-friendliness. In addition, the graphs in chapter 1.2 have been adjusted to show more synthesised information on the costs and returns of the dairy farms in various world regions. Chapter 1.14 is a new chapter showing time series trends on dairy farms from different world regions. It is a modified version which replaces chapter 2.8 in the Dairy Report 2010. The results permit an assessment of competitiveness and perspectives of dairy farm types.

The IFCN approach: a unique tool for benchmarking dairy farms worldwide

The IFCN method is based on the selection of typical farms that represent the most common farm types which produce the highest share of milk within a region or country. This method has the advantage that it has sufficient scope to consider diverse farm types (with a high variation in herd size, management level, dairy breeds, etc). In order to make a global comparison, milk from different farms in the world is adjusted to standard energy corrected milk (ECM) based on its fat and protein content. The IFCN approach considers all cash and non-cash costs of the dairy enterprise and also returns from milk and beef sales, as well as direct payments and other sources of income. This chapter summarises the key results from the 2011 analysis; more details are available in the IFCN farm result database, available as from October every year.

Dairy intensification: how does it affect costs?

Based on all 157 farms analysed, the average cost of milk production in the world was 40 US-\$/100 kg milk in 2010. The costs of milk production in Western Europe, Middle East, Canada and China were above this average while Eastern Europe, Africa, South America, Asia and Oceania had costs below the average. Based on regional averages, the cost of milk production ranged from 28 US-\$ in Africa to 53 US-\$ in Western Europe. See chapter 1.2

A simple comparison of farm results shows that the largest farms usually have a higher milk yield and also a higher cost of production compared to small farms. In Oceania, though the farms are large, milk yield is moderate and costs are lower than in other farms with higher yield due to the pasture-based production systems. Resource-use intensity varied greatly among countries and it was noticed that most average-sized farms had higher use of family resources (land, labour and capital) compared to the larger farms. Though the larger farms have higher use of rented land, hired labour and purchase feed, their cost of production only (per 100 kg milk) was generally lower than costs from average farms mainly due to the scale of production, and better management (feeding, reproduction, etc.).

Transition vs industrialised countries: which are more cost competitive?

Based on a time series trend (chapter 1.14), we see that the costs of milk production only, are stabilising at a level of 40 US-\$ in the industrialised countries (USA, Germany, UK) while they are increasing in the transition countries (Brazil, China, India). This is due to the increasing prices for land, labour and feed, and in most cases an appreciation of the currency in tran-

sition countries. If this trend continues in the next 2-3 years, it is most likely that many of the transition countries will produce at similar or higher costs than the industrialised countries.

Feed cost: how significant is it on the total cost?

Feed is the highest single cost component of the dairy farm. An analysis based on Activity Based Costing* shows that when considering regional averages, the proportion of feed costs on total costs varies from 46% in Western Europe and the CEEC to 74% in the Middle East (see chapter 1.2). In Africa, South America and Oceania the share is around 60%. The low proportion of feed cost shown in Western Europe and the CEEC is mainly because costs other than feed (such as quota and labour) are a major share of total costs, whereas these other costs are a very small share of costs in the Asian, Middle East and African farms. With the increasing feed prices, it is most likely that besides the economies of scale, feed management will play a more significant role in cost competitiveness.

Milk prices: was the higher world milk price in 2010 directly transmitted to farm profitability?

Since milk price is the major return from dairying, the changes in milk price significantly affect the farm returns. The lowest farm gate milk price in 2010 was 16US\$/100 kg ECM in Uganda while the highest milk price was 70US-\$ in Norway (Chapter 1.9).

There was a higher milk price in 2010 compared to 2009 in all regions of the world except Middle East (Jordan). This higher price was transmitted to higher profitability in the regions.

Political support/quota: do they still play a strong role in farm economics?

The EU farms are mainly family farms which are influenced by the quota system. These farms and also the farms from Canada, Israel and Norway have quota costs ranging from 0.1 to 8 US-\$/100 kg milk. In addition, due to the high input costs, the EU farms have the lowest entrepreneur’s profit (without decoupled payments). Farmers in the EU have been restructuring their businesses in response to these direct payments so they now rely on them, as the results for 2010 show (Chapter 1.11). This makes them vulnerable to any future changes.

Milk supply: who will gain market share in the future?

Considering that the largest producers are not necessarily the largest suppliers to milk processors, it is important to take a more detailed look at milk supply, which has a stronger influence on formal markets. Some big milk producing countries (e.g. India, Pakistan) do not deliver a significant volume of their milk to the processors, indicating that a high share of milk produced in the world is either consumed on farm or traded informally.

Based on the situation analysed in 2010 and considering larger farms from the 49 countries analysed (representing 87% of world milk production), and assuming that the selection of countries is representative for the world, about 59% of world’s milk delivered was produced at costs which were equal to, or below, the world market price for milk in 2010 (41.35 US-\$/100 kg milk). In 2009, due to the lower world milk price (26.2 US-\$/100 kg milk), only 12% of the world’s milk delivered was produced at costs which were equal to, or below, the world market price.

As the market price for milk fluctuates, low cost producers will always have an advantage in milk supply. However, if formal dairy chains are not developed in these countries, they will have a less significant impact on future trade

Explanation of variables:

Activity Based Costing = Costs obtained by allocating all costs of the profit and loss account into five activities on dairy farms. These activities are: labour, machinery, fuel, electricity and water.

1.2 Regional overview of costs and returns of the dairy enterprise

Introduction

Cost competitiveness of dairy production varies greatly and is heavily dependent on the conditions surrounding the dairy farms. In order to gain an insight into some of the differences, the typical dairy farms have been clustered by world regions.

Methods

Clustering of farms

All farms analysed in Chapter 1.6 – 1.12, have been clustered into eight different world regions. The charts show the average value for all farms within each region and in the first four charts, the range from the lowest to the highest within the region. This chapter simplifies some parameters which are shown in more detail in chapters 1.6-1.12 (except the share of feed cost on total cost). As the sample of farms is relatively small, the size of the clusters varies from 4 to 42 farms per cluster and the selection is therefore not really representative in a statistical sense, so the results should be interpreted with care.

Share of feed cost: This was obtained by dividing the total feed cost by the total cost of milk production. Feed cost is calculated using the activity based costing (ABC) obtained by allocating all costs of the profit and loss account into five activities on dairy farms. These activities are: labour, machinery, fuel, electricity and water. Profit and loss account costs were allocated to these activities by the country research partners.

Results for herd size and milk yield

Herd size: Based on the regional averages, the largest dairy farms are located in North America, followed by Oceania and the CEEC. Meanwhile, the smallest dairy farms are located in Asia and Africa. The widest range between the smallest and largest farm was observed in the CEEC where family farms with one cow co-exist with large corporate farms having more than 2,000 cows.

Milk yield: Two groups of regions can be distinguished based on milk yield; high yield regions (Western Europe, North America and Middle East) having about 8,000 kg ECM per year or more, and low yield regions (Africa, CEEC, South America, Asia and Oceania) with yields usually below 6,000 kg ECM. The highest range between the milk yields within farms of the same region was observed in Africa and South America where traditional pasture based dairy production systems using low yield local cows exist alongside high yield concentrate based systems with Holstein Friesian cows. Also, the lowest variation in milk yield was observed in North America and Oceania, which have a more homogenous production system.

Results - cost of milk production

Cost of milk production only

Two groups of regions can be identified in relation to the average cost among the clusters: low cost regions (Africa, CEEC, South America, Asia and Oceania) and high cost regions (Western Europe, North America and the Middle East). Low cost regions have a cost level of about 30 US-\$/100 kg ECM. For the high cost regions, Western Europe

Explanation of variables:

Indicators: All indicators represent a simple average for all farms in a cluster.

Data: All farms analysed in Chapter 1.6 are included. Classification of the typical farms is documented in Annex 4. **Year:** 2010; Uruguay, New Zealand, Australia = season 2009/2010, India = financial year 2010/2011. **Regions:** Western Europe (36 farms): All EU-15 countries analysed in Chapter 1 + NO and CH. North America (8 farms): CA and US. Middle East (6 farms): IL, JO and IR. Africa (16 farms): TN, DZ, MA, EG, UG, NG, CM and ZA. CEEC (16 farms): PL, CZ, RS, UA, BY, RU and AM. South America (18 farms): MX, AR, UY, PY, CL, BR and PE. Asia (12 farms): IN, PK, BD, ID and CN. Oceania (4 farms): AU and NZ.

Result variables: The variables are similar to those described in Chapters 1.7 and 1.9. **Cost of milk production:** Costs from P&L account minus non-milk returns + opportunity costs + quota costs. **ECM:** Energy corrected milk (4% fat, 3.3% protein). **The Entrepreneur's profit:** Milk price – cost of milk production only (for details see chapter 1.11)

has the highest cost (54 US-\$/100 kg), followed by the Middle East (48 US-\$) and North America (45 US-\$).

Share of feed cost on total cost: The share of feed cost on total cost lies between 46% and 50% in North America, Western Europe and the CEEC, while in the Middle East it is much higher (74%). In Africa, South America and Oceania the share is around 60%. The low proportion of feed cost shown in Western Europe and the CEEC is mainly because costs other than feed (such as quota and labour) are a major share of total costs, whereas these other costs are a very small share of costs in the Asian, Middle East and African farms.

Results for farm profitability

Returns of the dairy enterprise

Milk prices of about 45 US-\$/100 kg milk were observed in Western Europe, North America and Africa. The prices in the Middle East were highest (about 52 US-\$/100 kg milk), which could be due to a lower exposure to world markets (exports and imports) and probably a delay in response to the world market price. Meanwhile, the lowest prices (35 US-\$/100 kg milk) were found in the CEEC, South America and Oceania. Cattle returns ranged from 2 US-\$/100 kg ECM in Oceania to 16 US-\$/100 kg ECM in Africa. In general, cattle returns were higher in the regions of Middle East, Africa and Asia with more than 8 US-\$/100 kg ECM and lower in Oceania and North America with less than 4 US-\$/100 kg milk. Coupled direct payments of 1-6 US-\$/100 kg ECM were observed in Western Europe, North America, CEEC and Africa (Algeria). Moreover in Western Europe and in CEEC, 2-5 US-\$ of decoupled direct payments were paid. Very little or no direct payments were observed in Asia, the Middle East, South America, and Oceania.

Share of farms with entrepreneur's profit

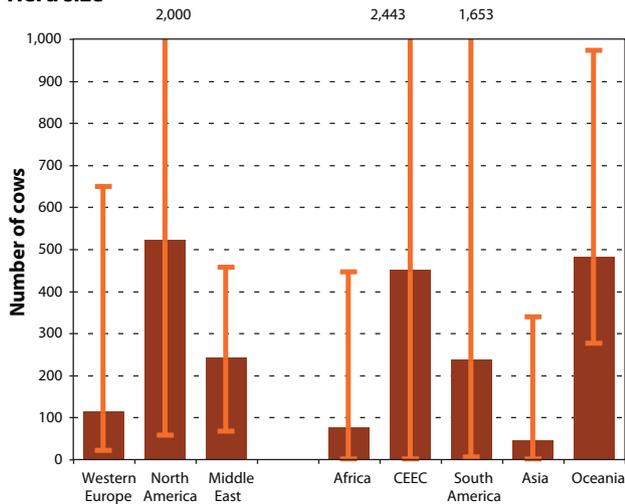
In the chart, the green bars show the proportion of the farms in the respective clusters which have an entrepreneur's profit above 1 US-\$/100 kg milk. In 2010 the regions of Africa, Asia and Oceania appeared to be more profitable than the other regions. About 83% of farms in Asia had a positive entrepreneur's profit; while only 14% of farms in Western Europe had a positive entrepreneur's profit. It should be noted that the entrepreneur's profit here does not include the decoupled payments which are on average 5 US-\$ in Western Europe.

Conclusions

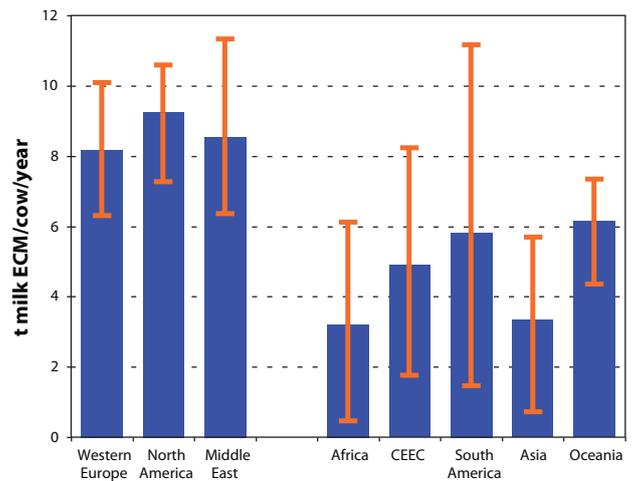
Based on the farms analysed the following hypotheses can be drawn: When considering world regions, the average costs in Western Europe, North America and the Middle East, were between 45 – 55 US-\$/100 kg which were significantly higher compared to the other regions. The leading farms in the US and EU have costs of about 32 US-\$ which are at a similar level to the average cost in the low cost regions (Africa, CEEC, Latin America, Asia and Oceania). In 2010 even with higher milk prices and direct payments, the Western European and North American farms achieved lower entrepreneur's profits per 100 kg ECM than the other world regions.

1.2 Regional overview of costs and returns of the dairy enterprise

Herd size

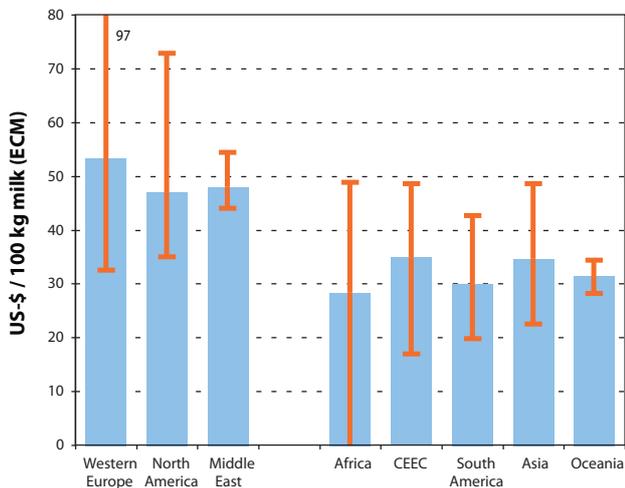


Milk yield

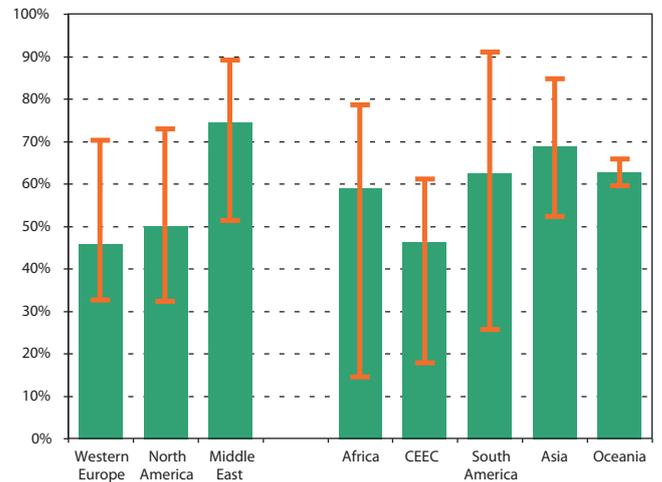


Returns of the dairy enterprise and decoupled payments

Cost of milk production only

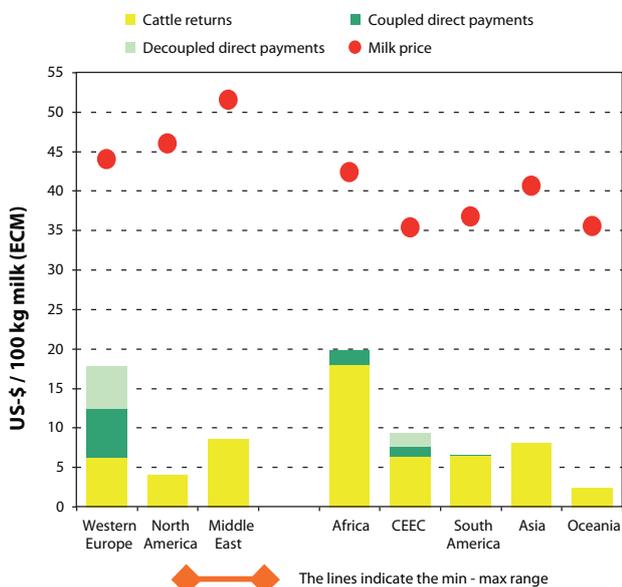


Share of feed cost on total cost

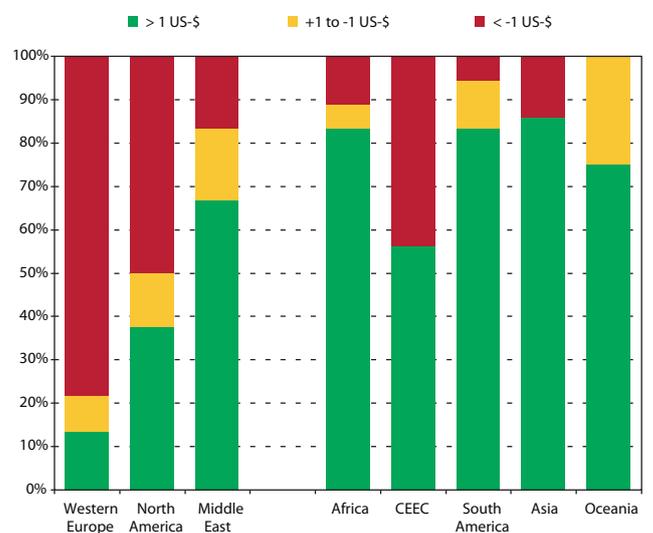


Farm profitability

Returns of the dairy enterprise



% of farms with entrepreneur's profit



1.3 Milk supply curves 2010

Introduction

The aim of this chapter is to create world milk supply curves which combine the specific cost levels and the milk volume per country in one chart. It is another way of presenting the IFCN results in addition to cost charts. It should be mentioned that the supply curves are based on a few farm types and many estimations. Moreover, differences in milk quality have not been taken into account. The results, therefore, should be interpreted with care.

Method

This chapter is based on the farm sorting shown in Chapters 1.4 and 1.5. A combination of the two cost levels (average and larger farms) analysed by IFCN and the difference between milk produced and delivered to processors, creates 4 different milk supply curves.

Milk produced: supply curve for average sized farms

This supply curve is based on the average sized typical farms analysed (see selection Chapter 1.4) and the milk volumes produced. The 49 countries analysed represent 87% of world milk production. Assuming that the selection of countries would be representative for the world, about 56% of world's milk was produced at costs which were equal to, or below, the world market price for milk in 2010 (41.35 US-\$/100 kg milk).

Milk produced: supply curve for larger farms

The supply curve is based on the larger typical farms analysed in each country and the milk production per country. If all the milk in these countries were produced by these farms, then 65% of the world's production in 2010 would have been produced at a lower cost than the IFCN world market price.

Milk produced vs milk delivered in 2010

As a high share of the world's milk is consumed on the farms or used on the "local" informal markets, a second set of milk supply curves has been developed. These curves are based on the milk volumes delivered to milk processors. Based on these estimates, the countries

analysed represent more than 90% of the milk which is delivered to processors. High volumes of milk that do not reach the processors were found in India, Pakistan, Brazil and a number of countries in CEEC. As these countries belong mainly to the low cost milk producers, the supply curve based on milk delivered looks significantly different from the one based on milk production.

Milk delivered: supply curve for average sized farms

This supply curve is based on the costs of the average sized typical farms analysed in each country and the milk volume delivered to processors. Assuming that the selection of countries is representative for the world, 37% of world's milk delivered was produced at a cost equal to or below the IFCN world milk price level of 2010.

Milk delivered: supply curve for larger farms

This supply curve is based on the costs of the larger typical farms analysed in each country and the milk volume delivered. If all the milk in these countries was produced by these farms, then 59% of the "world's milk" delivered in 2010 would have been produced at a cost equal to or below the IFCN world market price level of 2010. This is significantly higher than the figure for 2009, as the world milk price increased from 26.2 to 41.4 US-\$/100 kg milk (ECM).

Future world supply situation

The milk supply curves give an indication of what the equilibrium world milk price could be under more liberal dairy trade conditions, assuming that all delivered milk is tradable internationally. Based on the situation analysed in 2010 with its feed prices, beef prices, direct payments, exchange rates and farming systems, 59% of world milk was delivered at a milk price less than or equal to 41.35 US-\$. At a price level of 30 US-\$/100 kg, "marginal milk suppliers" would be larger farms in New Zealand, Paraguay and Ukraine; while low cost suppliers would be Argentina, India and Pakistan. At a world market price level of 45 US-\$, marginal suppliers would be the larger farms in Israel, the Netherlands and Belgium.



Explanation:

Selection of average sized dairy farms: See Chapter 1.4. **Selection of larger typical dairy farms:** See Chapter 1.5.

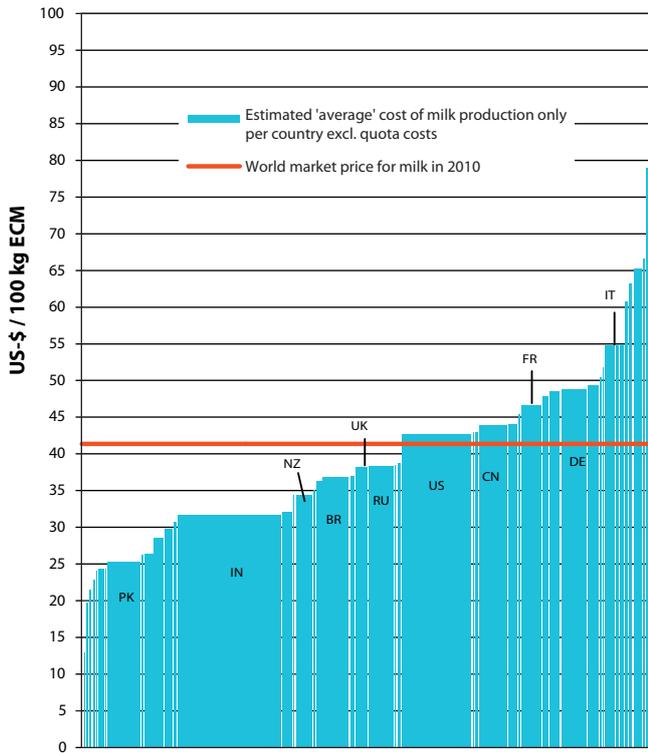
Milk production data: Figures are in ECM (energy corrected milk (4% fat, 3.3% protein)) and represent the year 2010, Source: IFCN Dairy Report 2011.

Milk delivered: Figures are based on the share of milk delivered estimated for the IFCN Dairy Report 2011.

Marginal suppliers: Producers with the lowest profit margin at current price level, assuming a common price level for all farms.

Milk produced: supply curve for average sized farms 2010

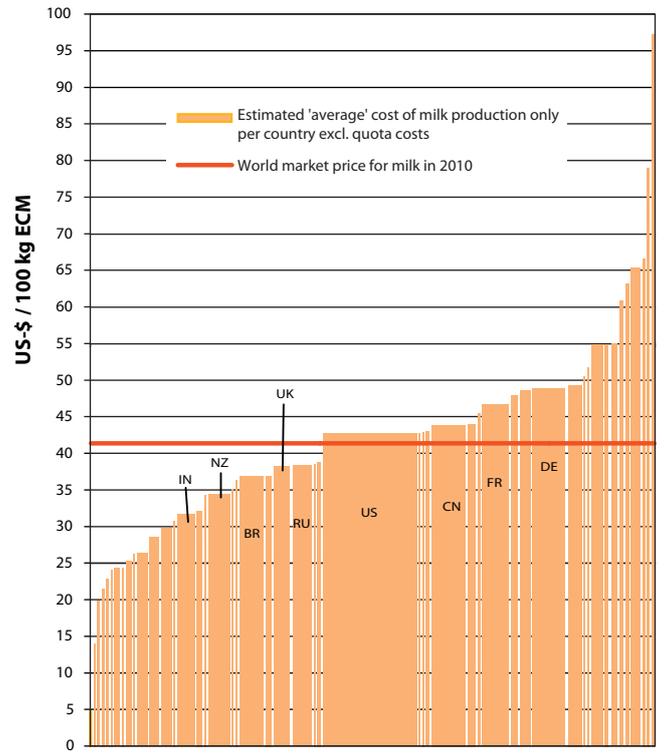
Based on the average sized dairy farms analysed and milk produced



Milk production per country (sorted and accumulated)

Milk delivered: supply curve for average sized farms 2010

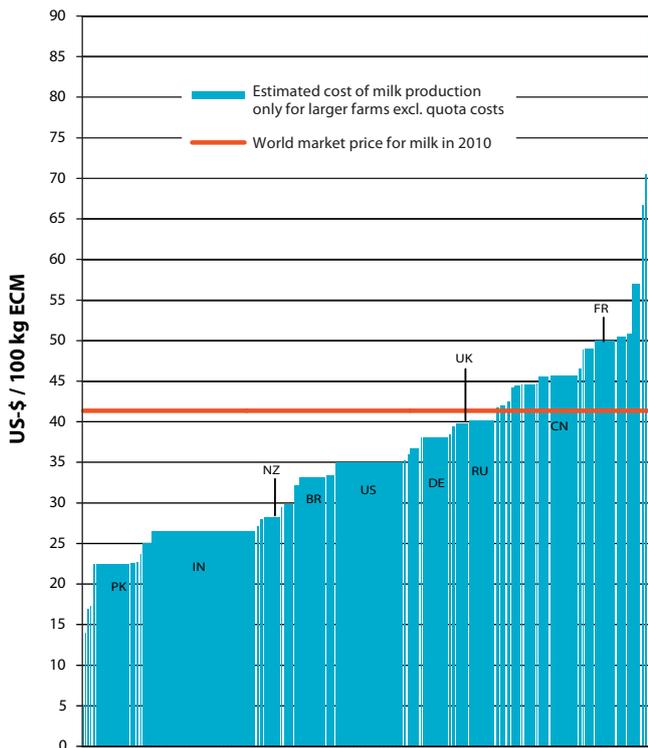
Based on average sized dairy farms analysed and milk delivered



Milk delivered to processors per country (sorted and accumulated)

Milk produced: supply curve for larger sized farms 2010

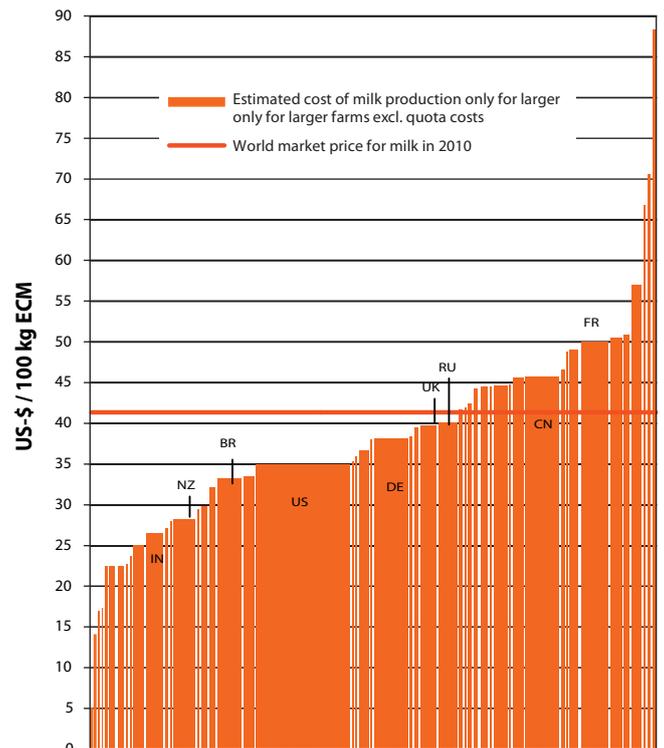
Based on the larger typical dairy farms analysed and milk produced



Milk production per country (sorted and accumulated)

Milk delivered: supply curve for larger sized farms 2010

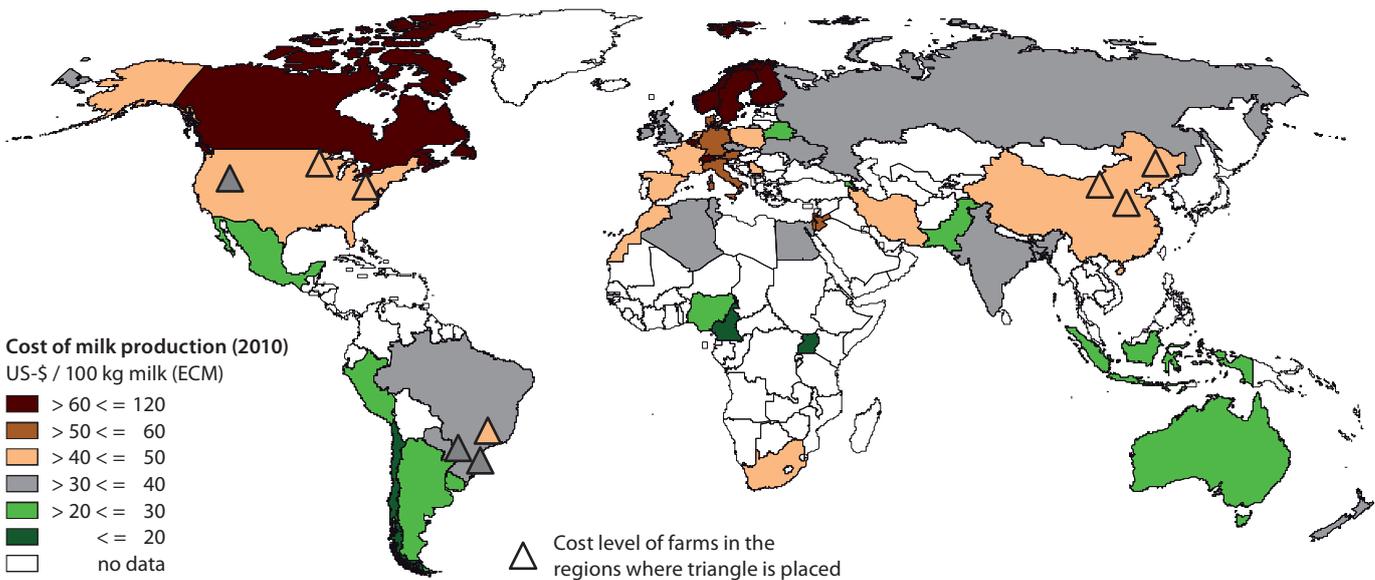
Based on the larger typical dairy farms analysed and milk delivered



Milk delivered to processors per country (sorted and accumulated)

1.4 Cost of milk production in average sized farms 2010

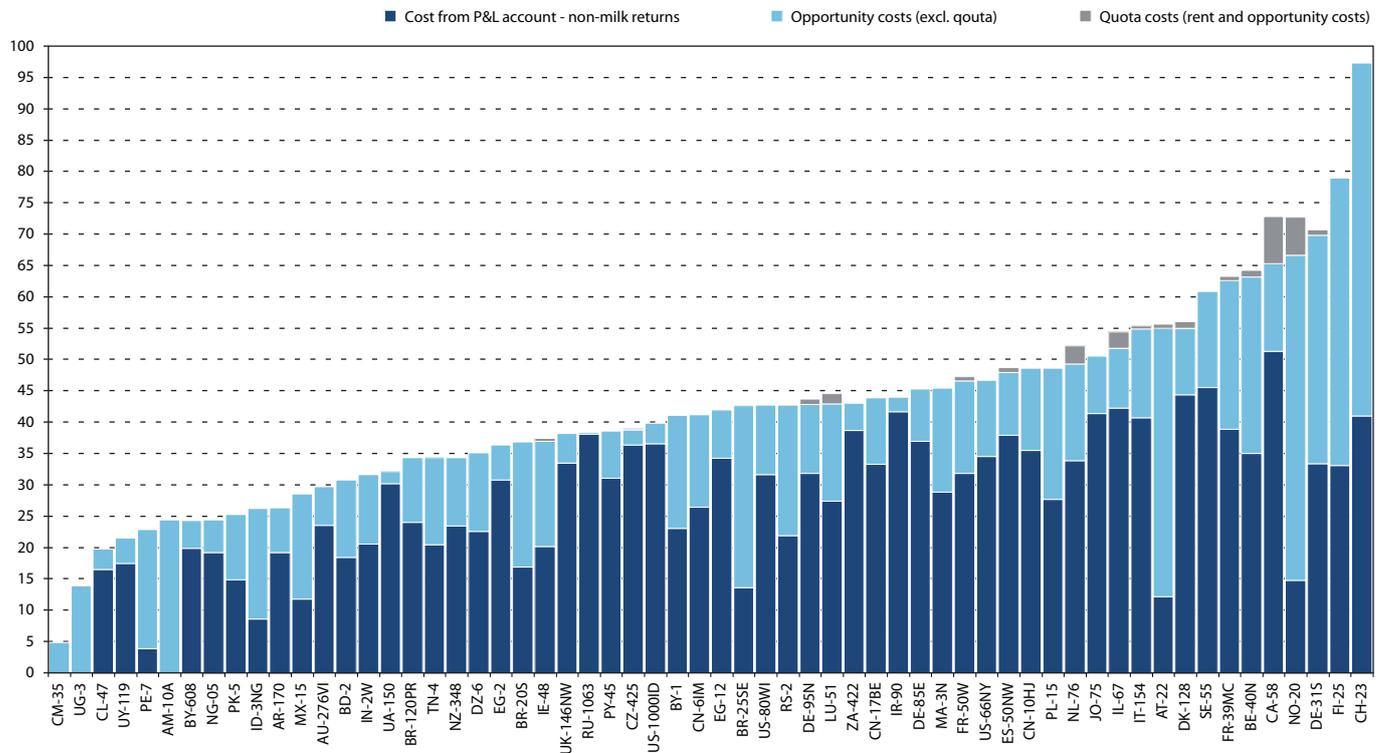
Cost of milk production in average sized farms 2010



Indicator: Cost of milk production (excluding quota cost) of the "average sized" farms analysed in the countries.

Cost of milk production in average-sized farms per country 2010

US-\$ / 100 kg milk (ECM)



Explanation:

Farm code: Example: CM-35=35-cow farm in Cameroon (details see Annex A.5)

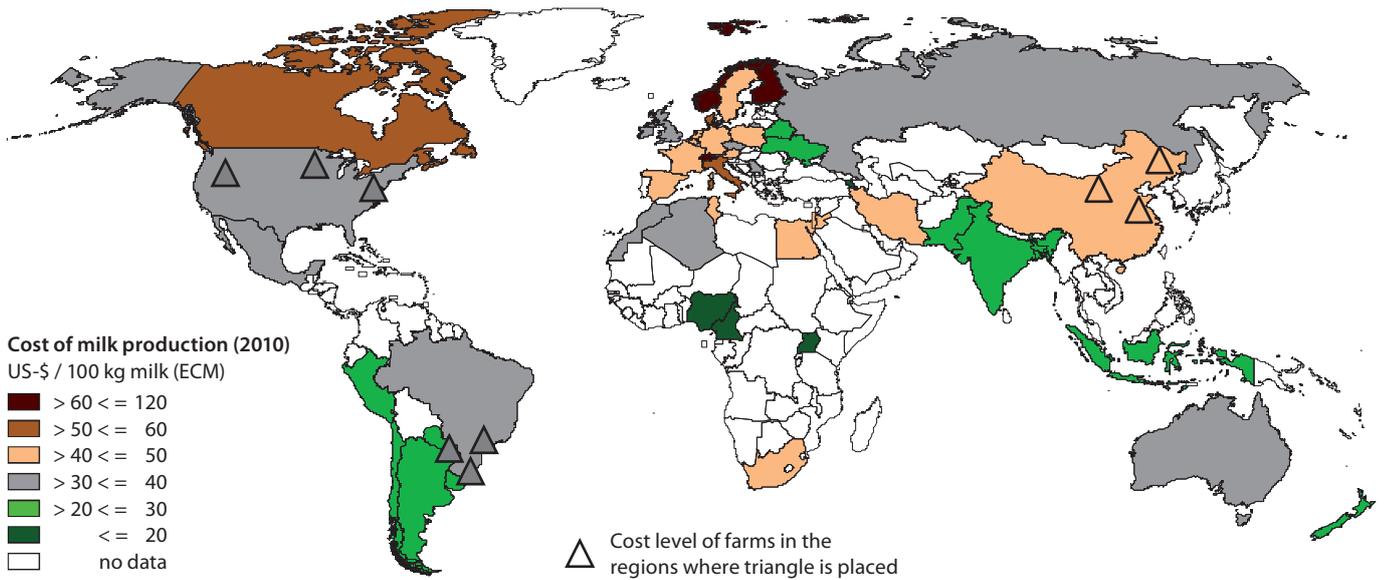
Indicator on the map: Cost of milk production only (excluding quota costs) of the "average sized" farms analysed in the countries. For details see Chapter 1.7. This indicator was also used for farm sorting in the cost chart and for the milk supply curves in Chapter 1.3.

Selection of average sized farms: In most cases the farm type closer in size to the country's average was chosen (see Chapter 1.6).

Special cases: In countries where different regions or farming systems were analysed, the average sized farm from each region was used in the cost ranking.

For the cost maps, an average cost calculated from all average sized farms (from the different regions) was used for the whole country. This was the case for Brazil, China, Germany and the US. Additionally, the regional cost levels have been indicated by the colour of the triangles positioned in the respective regions. The farms FR-50W and BY-608 were used for France and Belarus respectively.

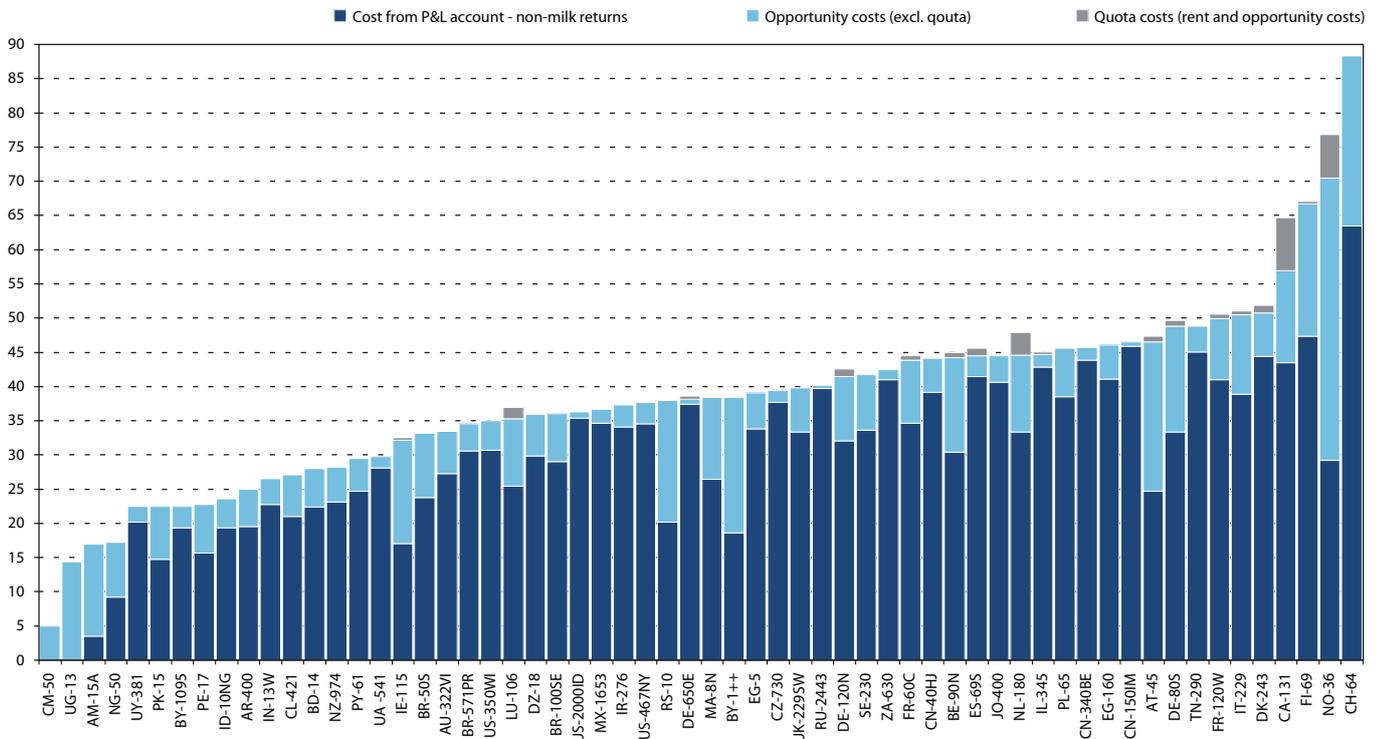
Cost of milk production in larger farms 2010



Indicator: Cost of milk production (excluding quota cost) of the "larger" farms analysed in the countries.

Cost of milk production in larger farms per country 2010

US-\$ / 100 kg milk (ECM)



Explanation:

Farm code: Example: CM-50=50-cow farm in Cameroon (details see Annex A.5)

Indicator on the map: Cost of milk production only (excluding quota costs) of the "larger" farms analysed in the countries. For details see Chapter 1.7. This indicator was also used for farm sorting in the cost chart and for the milk supply curves in Chapter 1.3.

Selection of larger farms: In most cases the second farm type was chosen (see Chapter 1.6).

Special cases: In countries where different regions or farming systems were analysed, the larger farm from each region was used in the cost ranking.

For the cost maps, an average cost calculated from all larger farms (from the different regions) was used for the whole country. This was the case for Brazil, China, Germany and the US. Additionally, the regional cost levels have been indicated by the colour of the triangles positioned in the respective regions. The farms FR-120W and BY-1095 were used for France and Belarus respectively.

1.6 Description of the dairy farms analysed

Background

The IFCN estimates that, globally, the average dairy herd size was 3.09 cows per farm in 2010 (Chapter 3). In order to “create a better understanding of milk production worldwide”, we aim at using this chapter to give some background information on the farms analysed and also explain the tendencies observed which justify the current situation. In 2011, we have analysed 157 farms with herd sizes ranging from 1 (one) cow to more than 2000 cows. The detailed analysis in chapters 1.6 – 1.12 covers 120 typical dairy farms from 60 dairy regions and 49 countries from all over the world, which represent 87% of the total world milk production. For each region analysed, two farms: one average sized farm and one larger farm have been used. For more details on this method see Annex A4.

Exceptions to this are **a)** countries with **dual milk production systems** where very large farms exist alongside very small ones such as in Belarus **b)** countries like Egypt where small-scale buffalo farms exist side by side with more professional cow farms, **c)** **large countries with high regional variation** in milk production (Brazil, China, USA), and **d)** countries where the **management level** on the farms is relevant (Belarus). In this case, the second and better managed farms are of the same size as the first and are marked as “++”

Special case of China-Beijing The CN-340BE is a “cooperative” type farm where an investor sets up the farm infrastructure (barn, parlour, feed storage, roads, electricity, etc.) and small farmers (3 to 40 cows) rent these facilities, as well as services such as milking, veterinary and insemination, by supplying milk to the investor at a lower price. CN-17BE represents the small farms in this unit whereas CN-340BE represents the whole “cooperative” unit (20 farmers with 17 cows plus investor as farm owner).

Method

Farm size: This represents the average number of adult dairy cows (dry and lactating) per year. The statistical average of dairy farms showed the country average in 2010. Family and household vs business farms: Farms having less than 50% share of family labour on total dairy labour have been defined as business farms, while those having 50% and above are family/household farms.

Milk yield: The total volume of milk/cow/year: first approach, based on natural content (not adjusted), second approach, energy-corrected milk (ECM; 4% fat, 3.3% protein).

Holstein Friesian (HF) vs other breeds: All farms having pure HF cows are marked blue on the chart. Farms marked as having “other breeds” include those with HF crossbreeds and other breeds, for example; dual purpose breeds (Norway, Switzerland), local cattle breeds (Brazil, Cameroon), and buffaloes (Egypt, Pakistan).

Comparison of farm size

Countries influenced by a quota system have small family farms: Mainly farms in Western Europe, Canada and Israel. Generally, average and larger farms in these countries are family owned. Average sized farms usually have between 35 and 50 cows while larger farms have up to 200 cows. Some exceptions: Norway, Finland and Austria where

geographical conditions and land tenure systems hinder development of larger farms.

Eastern European countries have large farms and/or very small farms: In general, before 1990, the agricultural policy of Eastern European countries aimed at developing large farms. After 1990 different trends were noticed **a)** large farms were maintained (Belarus, the Czech Republic) **b)** large scale farms were reorganised and the cows distributed to smaller household farms (Ukraine, Russia) **c)** the family farm culture has become stronger in Poland where 95% of Polish dairy farms keep less than 20 cows.

Developing and transition countries have small farms with less than 15 cows: Generally, most farms in Africa, Asia and Latin America have less than 15 cows. Here we distinguish three groups of farms: **1. subsistence farms** having 1-5 cows or buffaloes (average sized farms in Bangladesh, India and Pakistan). **2. Small-scale market-oriented farms** with 5-10 cows (larger farms in Algeria, Bangladesh, Egypt, India, Indonesia, Morocco and Pakistan). **3. Business farms** with more than 10 cows (Nigeria, South Africa).

In North and South America and in Oceania with no quota system, family farms are growing into larger farms: This is the case in the USA, Argentina, Uruguay, Australia and New Zealand.

Oceania has the highest statistical average farm size in the world: The only countries having a statistical average of above 200 cows per dairy farm are Australia and New Zealand. One reason for this is that they are pastoral farms, the other is that they export a high proportion of their production (>90% in NZ, >50% in Australia). The prices they receive for their milk are the world market prices as there is no price support. The farmers therefore have had to find ways of ensuring that their cost of production is lower than the world prices. As about 85% of costs are fixed on pastoral farms, the strategy of increasing farm size has enabled farms to lower costs of production and, at the same time, deliver an improved net return to the family. In addition, the presence of a liquid land market facilitates trade of farms, so it is easier for farms to merge.

High milk yield: All Holstein Friesian farms with intensive management and feeding systems have a milk yield of more than 7,000 kg up to 11,000 kg. This is the case in Western Europe, USA, and Israel. Generally, about 60% of all farms analysed have a pure Holstein Friesian herd.

Moderate milk yield: These are usually grazing based farms with less intensive feeding and/or management as well as farms with other breeds, (not Holstein Friesian) such as dual purpose breeds. These farms generally have a milk yield of 4,000 to 7,000 kg, found mainly in the CEEC, Latin America, China and Oceania.

Low milk yield: These farms usually have a milk yield of less than 4000 kg and are mainly found in Africa, South and South East Asia and other countries which have buffaloes, local breeds, and crossbreeds with a high share of local genetic composition.

Natural content vs ECM: The buffalo farms in Egypt and Pakistan, as well as the farms in Finland, Ireland, Luxembourg, New Zealand, have higher fat and protein content (>4% and >3.3% respectively) giving them an advantage in milk yield due to the ECM conversion. On the other hand, most farms in the Middle East, North America and Latin America have a lower fat and protein content giving them a disadvantage in milk yield due to the ECM conversion.

Explanation of variables

Farm codes: Example BR-20S = Brazilian 20-cow farm in Southern Brazil (details see Annex 5). **Year of data collection:** 2010; Uruguay, New Zealand, Australia = season 2009/2010, India = financial year 2010/2011. The farms from AM, IR, MA, DZ, TN, were analysed for the first time. Results should be treated with care.

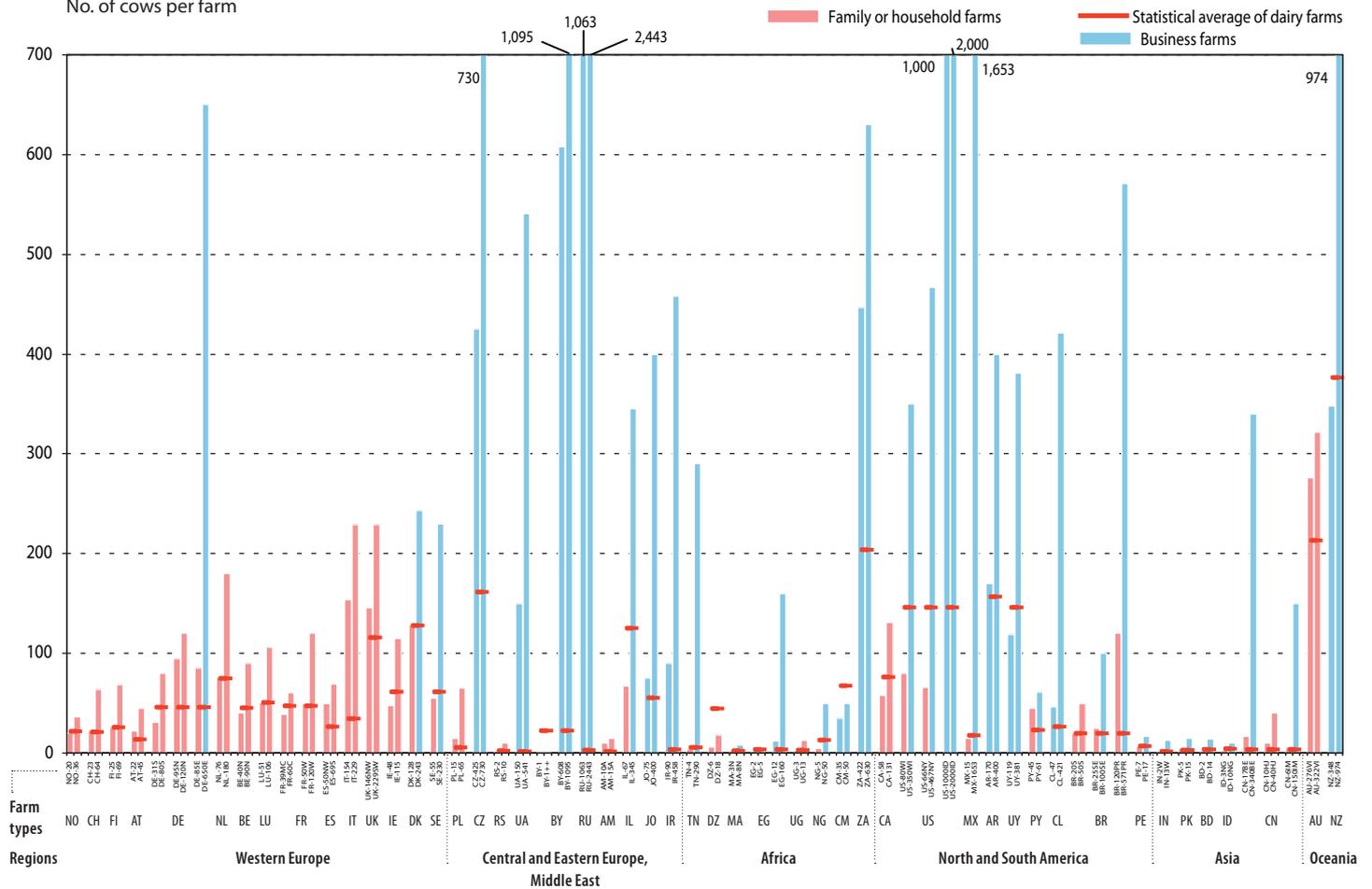
No. of cows: Average number of dairy cows (dry and lactating) per year. Statistical average of dairy farms: Country average 2010. **Milk yield:** Milk yield per cow and year (Energy-corrected milk (ECM) 4% fat, 3.3% protein).

Challenges in defining family farms: We have used a minimum of 50% family labour input in dairy as the limit to define family farms, based on workshop results of the IFCN 2010 Dairy Conference. This assumption is challenging especially in family owned farms where only the management is done by the family.

1.6 Description of the dairy farms analysed

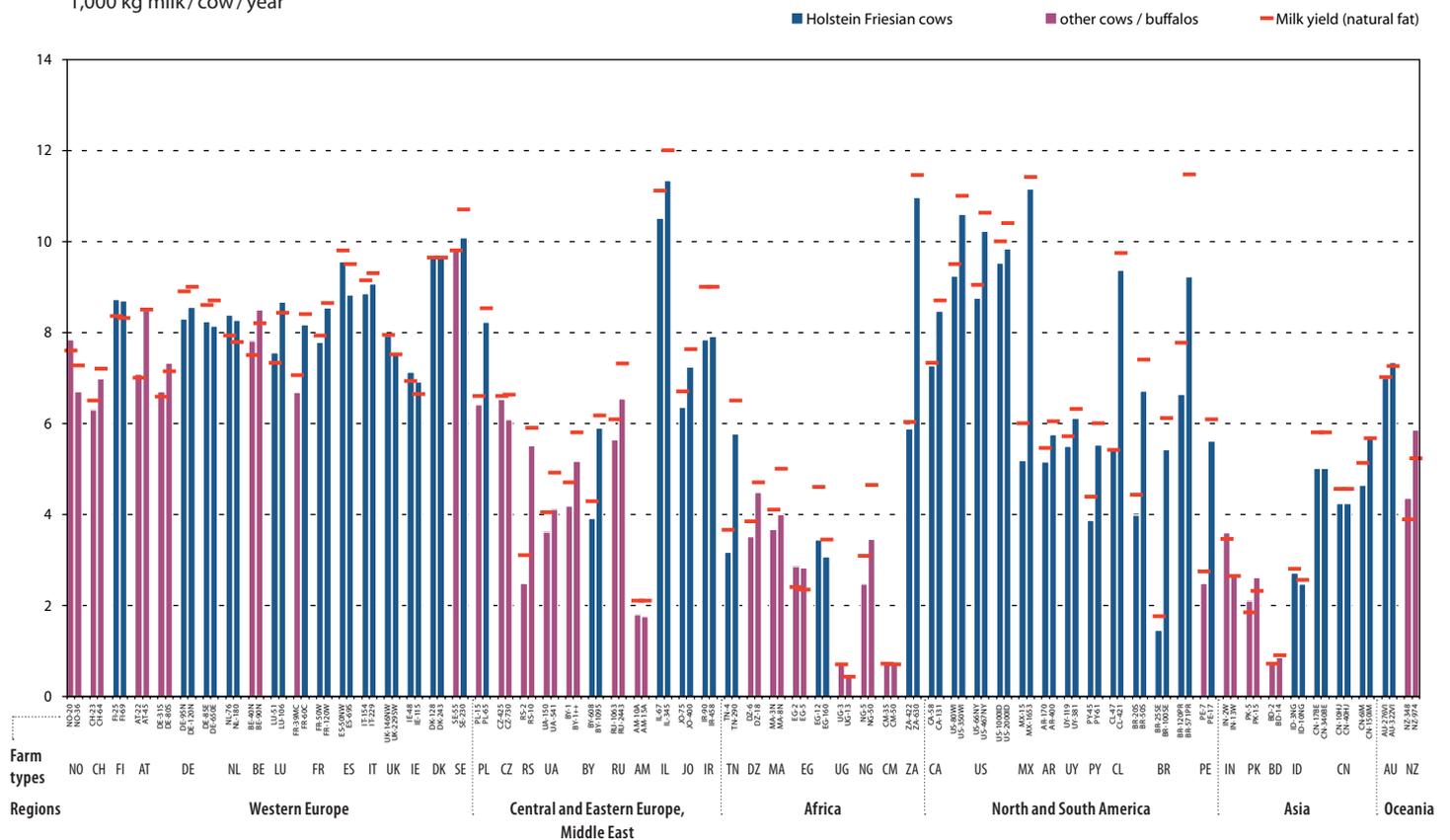
Farm size

No. of cows per farm



Milk yield

1,000 kg milk/cow/year



1.7 Cost of milk production only

Background

Cost of milk production is the main component of the dairy chain. It also gives an idea of the competitiveness of production in various regions. In addition, a comparison of the cost of milk production only and the milk price affords a good perspective of the profitability of the farms.

Method

The total costs from the profit and loss analysis are related to the total returns of the dairy enterprise including milk and non-milk returns (cattle returns and coupled direct payments). In this chart the non-milk returns have been subtracted from the total costs to show a graph which can be compared with the milk price. To indicate the effect of opportunity costs, they are shown separately from the other costs. In some cases, the non-milk returns were higher than the cash cost of the dairy enterprise. In these cases, the bars on the charts are striped and show the opportunity cost only. For more details on the IFCN cost method, see the chart on the next page and Annex 6.

Results on cost of milk production only

Results from the cost of milk production only can be summarised in four main cost levels:

Level 40-50 US-\$ in the EU, Middle East and China

Many countries of the EU including Germany, France and Spain have a cost level between 40-50 US-\$/100 kg milk. Exceptions are the UK and Ireland with lower costs, while Austria and Finland have higher costs. UK and Ireland have lower cost levels, partly because of the favourable climatic conditions for pasture growth which allow dairy farmers to make better use of forage and reduce feed cost. Iran, Israel and Jordan from the Middle East also have a similar cost level of 40-50 US-\$.

Level 35-40 US-\$ in the USA, Brazil and CEEC

The cost of milk production was at a level of 35-40 US-\$ in the US and Brazil. Many CEEC countries including the Czech Republic, Serbia, Russia and the family farms from Belarus also had a cost level similar to that of the US.

Level <30 US-\$ in Africa, Asia, South America and Oceania

The level <30 US-\$ was common for Asia (except China), South America (except Brazil) and Oceania. Cameroon, Nigeria and Uganda from Africa also had costs below 30 US-\$. However, the costs in Africa varied greatly and were highest in North Africa and South Africa.

>60 US-\$ in Austria, Norway, Switzerland and Canada

The highest costs of more than 60 US-\$ were observed in Austria, Finland, Norway, Switzerland and Canada. Quota costs in Norway and Canada were the highest among the farms analysed.

Analysing cost components

Quota costs

The quota costs are gradually decreasing in the EU countries where the quota system is expected to end in 2015. However, the costs are still high in the Netherlands, Luxembourg and Denmark. In **Denmark** the quota is still limiting production. Due to the financial and economic crises, many farmers have had to improve their cash flow by increasing milk production which has, in turn, increased the demand for quota. In the **Netherlands** and **Luxembourg** quota can be traded freely. This means that quota prices depend on supply and demand. The demand side is still willing to pay a rather high price, knowing that some farmers are able to earn money even when paying the high price. On the other hand, some farmers expect another restriction after 2015, related to animal production rights. In Norway, Israel and Canada, where the quota system still operates fully, quota costs are also very high.

Cost P&L – non milk returns vs opportunity costs

The proportion of opportunity costs on total costs varies greatly among the various farms. These differences may be due to one or more of the following reasons: **a) Farm size and ownership:** Generally, family farms and/or small farms use more family resources for milk production and therefore have higher opportunity costs than the larger farms. **b) Location of the farms:** Farms from less favoured regions in Europe (Norway, Switzerland, Austria, Finland), which are usually family farms; also have very high proportion of opportunity costs since they have to use large amounts of family resources to produce under these conditions. **c) Feeding systems:** Farms which produce a higher proportion of feed from their own land have higher opportunity costs, while those with higher proportion of purchased feed have higher costs from the P&L account. This would also be noticeable in the grazing farms where the greater intensity of supplementation would increase the costs from the P&L account.

The non-milk returns were higher than the cash cost of the dairy enterprise in the beef producing farms of Armenia, Cameroon and Uganda. This is due to the fact that these farms have beef producing breeds and make a higher share of their returns from beef sales. In these cases, the charts are striped and show the level of opportunity costs only.

Explanation of variables

Farm codes: Example BR-20S = Brazilian 20-cow farm in Southern Brazil (details see Annex 5). **Year of data collection:** 2010; Uruguay, New Zealand, Australia = season 2009/2010, India = financial year 2010/2011. The farms from AM, IR, MA, DZ, TN, were analysed for the first time. Results should be treated with care.

Costs from P&L account: Costs as calculated in the Profit and Loss account.

Non-milk returns: Cattle returns (calves, heifers, cull cow receipts, excluding VAT) and coupled direct payments (including VAT surplus). NB: Decoupled payments were excluded in this analysis.

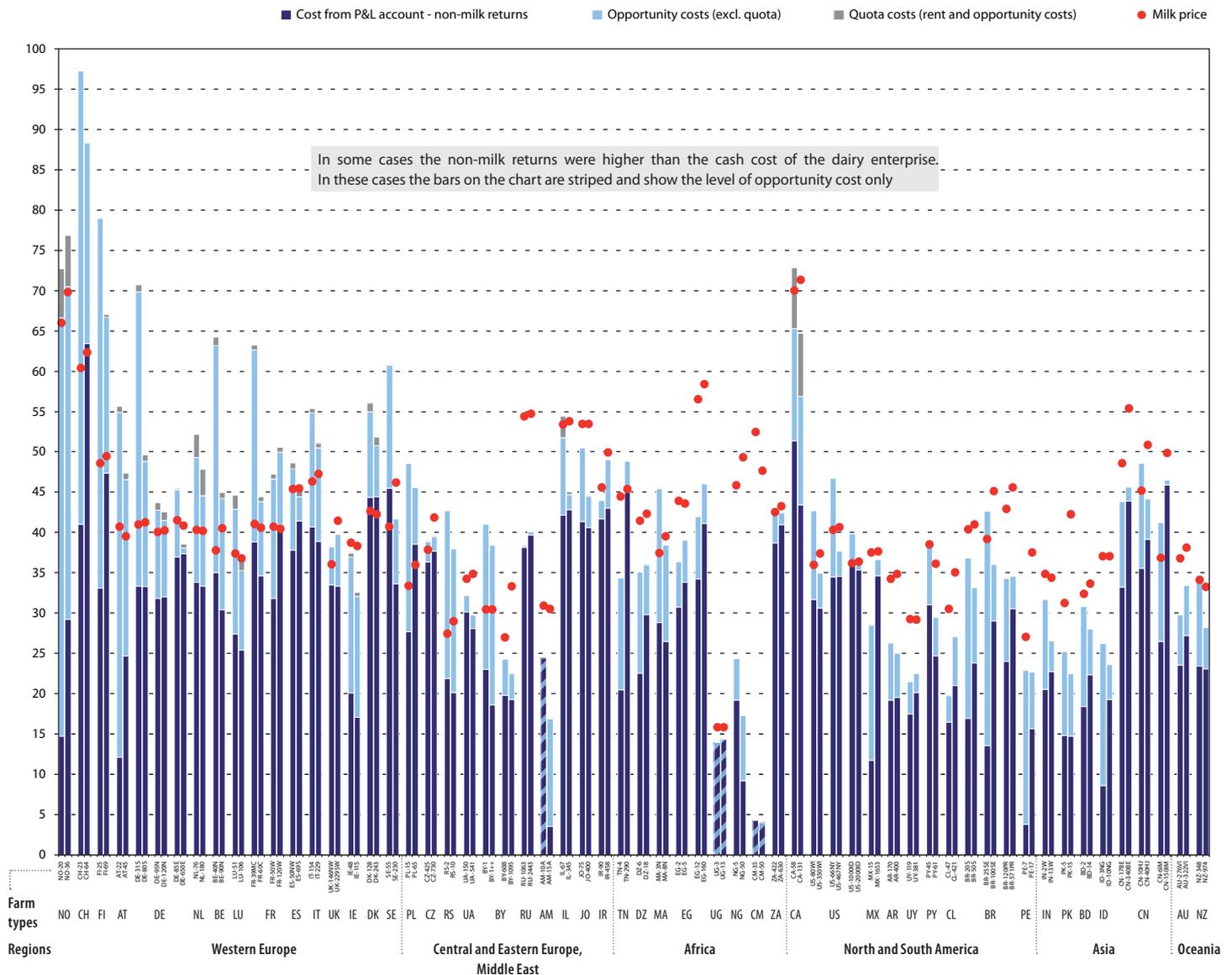
Opportunity costs: Costs for using own production factors (land owned, family labour input, and equity excluding quota).

Quota costs: Quota rents paid + opportunity cost for quota owned (3% interest on quota value). Special case: Due to very high non-milk returns and low milk yields, costs of milk production only in rural farms in Armenia (AM-10A), Cameroon (CM-35 and CM-50) and Uganda (UG-3 and UG-13) were negative.

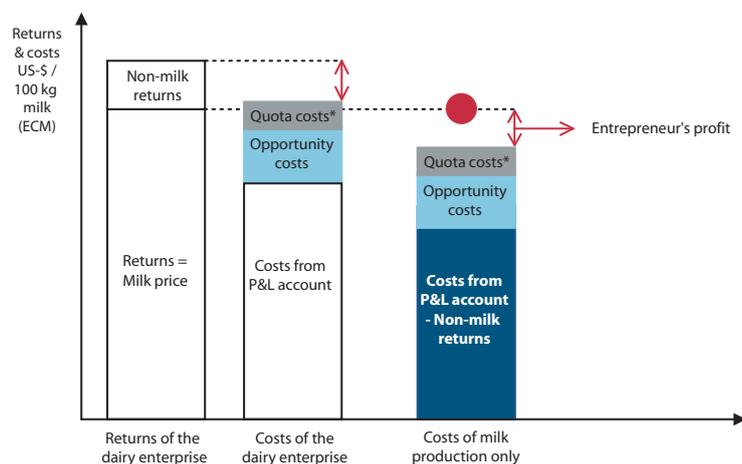
Milk price: Average milk prices (excluding VAT) adjusted to energy corrected milk (ECM 4% fat, 3.3% protein).

Cost of milk production only

US-\$ / 100 kg milk (ECM)



Method



* Rent and opportunity costs for quota.

The total costs of the dairy enterprise are related to the total returns of the dairy enterprise including milk and non-milk returns (cattle returns and coupled direct payments). Therefore the non-milk returns have been subtracted from the total costs to show a cost bar that can be compared with the milk price. This figure explains the method.

1.8 Total costs and returns of the dairy enterprise

Background

The graph in Chapter 1.7 presents a simplified picture of milk production costs and Chapter 1.9 shows a more detailed picture of non-milk returns. A combination of total farm costs and all farm returns gives us a holistic view on the farm economics. The graph in this chapter shows the total costs of the dairy enterprise per 100 kg milk compared to four different return levels which helps us to evaluate how dependent the farms are on the different side returns (non-milk returns).

Method

The graph considers the following four return levels: 1) **Milk price:** Average milk prices (excluding VAT) adjusted to energy corrected milk (ECM 4% fat, 3.3% protein). These would be the returns if all direct payments and all beef returns were zero. 2) **Milk price + non-milk returns:** Milk price + cull cows, calves, heifer returns + changes in livestock inventory + other returns such as selling manure. These would be the returns if all direct payments do not exist. 3) **Milk price + non-milk returns + coupled direct payments:** This represents the return structure of the farm with decoupling. 4) **Milk price + non-milk returns+ all direct payments:** This represents the total returns of the farms including all direct payments (coupled and decoupled). For details on direct payment approaches see Chapter 1.10.

Which farms are only slightly affected by changes in non-milk returns?

Non-milk returns have low impact on incomes of farms in South Africa, Canada, Mexico, Argentina, Uruguay, Paraguay, Chile, India, Australia and New Zealand. These low non-milk returns could be due to low cattle and beef prices and/or low milk yield and also the absence of direct payments for the countries in North America, Africa, Asia and Oceania.

Which farms would be affected by changing beef/cattle prices?

If the beef and cattle prices decreased significantly as during the BSE crisis (*ceteris paribus*), some farms would be affected significantly. These are the farms in Norway, Switzerland, Algeria, Morocco, Egypt, Uganda, Nigeria, Cameroon, Brazil and Indonesia.

Which farms will make a loss without direct payments or if all payments are decoupled?

If the direct payments are not paid, or are completely decoupled, the following farms will no longer be able to cover their costs from the profit and loss account (*ceteris paribus*) and will generate a negative farm income (without decoupled payments): farms in Switzerland and also SE-55 and DZ-18.

Which farms receive additional (decoupled) payments?

This chart permits us to make comparisons between countries which have already decoupled most of the direct payments, with those which still have coupled payments.

Method comparison: Difference in costs per 100 kg milk

The costs shown in Chapter 1.7 and 1.8 are different, especially for farms with high non-milk returns. Method 1 (Chapter 1.7) explains the situation where the milk price covers the net cost of milk i.e. the full economic costs minus the non-milk returns (coupled direct payments and cattle prices). Method 2 (Chapter 1.8) shows the full economic costs for the dairy enterprise.

Using cost method 1, the Spanish farm has a 1 US-\$ higher cost than the Austrian farm. By using cost method 2 the Austrian farm has higher costs which are due to the higher non-milk returns.

Cost difference of a Spanish farm (ES-50NW) and Austrian farm (AT-45) using two methods

	Cost method 1	Non-milk returns US-\$/100 kg milk	Cost method 2
Farm: ES-50NW	48	4	52
Farm: AT-45	47	14	61
Difference ES vs. AT	+1	-10	-9



Explanation of variables

Farm codes: Example BR-20S = Brazilian 20-cow farm in Southern Brazil (details see Annex 5). **Year of data collection:** 2010; Uruguay, New Zealand, Australia = season 2009/2010, India = financial year 2010/2011. The farms from AM, IR, MA, DZ, TN, were analysed for the first time. Results should be treated with care.

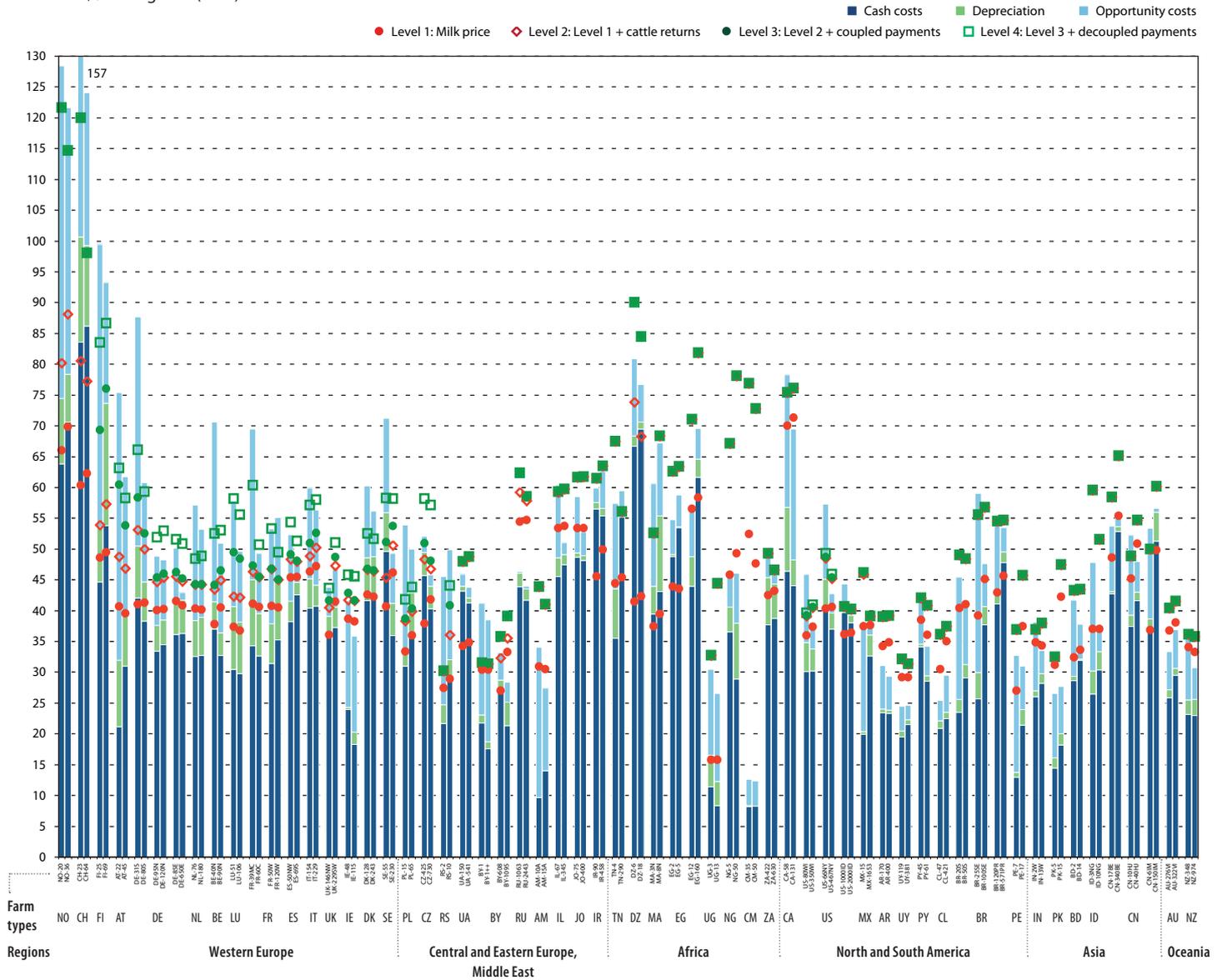
Cash costs: Cash costs for purchased feed, fertilizer, seeds, fuel, maintenance, land rents, interest on liabilities, wages paid, vet + medicine, water, insurance, accounting, etc. (excluding VAT).

Depreciation: Depreciation on purchase prices for buildings, machinery (excluding VAT).

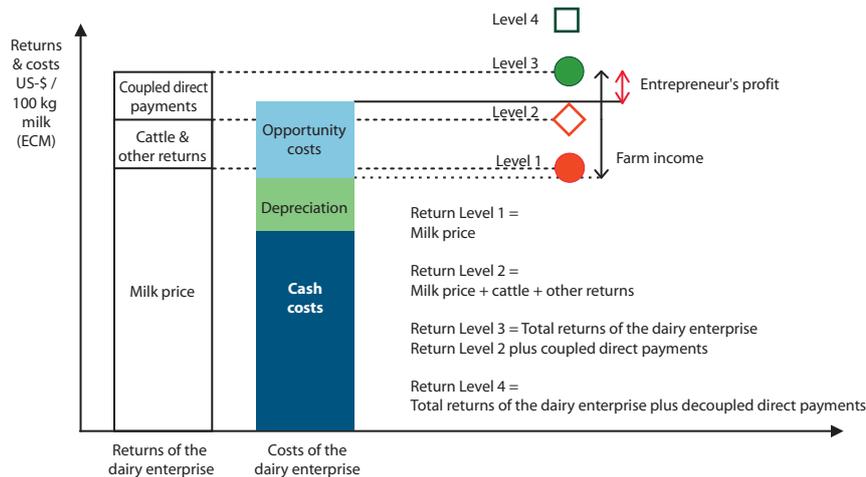
Opportunity costs: Costs for using own production factors (land owned, family labour input, and equity including quota).

Total costs and returns of the dairy enterprise

US-\$ / 100 kg milk (ECM)



Method



In this graph the total costs of the dairy enterprise have been compared with different return levels of the dairy enterprise.

1.9 Returns: Milk price, non-milk returns and decoupled payments

Background

Dairy farms have different sources to generate returns. Returns from sales are mainly from milk and cattle and sometimes from sources like manure or surplus feed. A substantial part of farm income could be direct payments; meanwhile, other subsidies (fuel, fertiliser, insemination, etc) are also important in some countries. This chapter gives a detailed view of the separate components of farm returns.

Method

The “world market price for milk”: Calculated from the average world market prices for butter and SMP (skim milk powder) in 2010 (see chapter 2.4). **The national average milk price:** Milk price based on national statistics and converted to ECM. **Farm specific milk price:** Farm gate milk price (ECM). **Weighted milk price for EU:** Average national milk price for all EU countries, weighted by the share of their milk production volumes as compared to the total EU milk production.

Cattle returns: Returns from selling cull cows, calves and surplus heifers +/- livestock inventory changes. **Coupled and decoupled direct payments:** See Chapter 1.10. **VAT balance:** For farms that do not balance the VAT with the tax department, a surplus, if there is one, is shown in one bar together with the coupled direct payments, and if there is a deficit, it is included in the cost of milk production.

Milk prices in 2010 – Overview

Farm specific milk prices range from 16 US-\$ in Uganda to 70 US-\$ in Norway and Canada; the national average milk prices range from 19 US-\$ in Uganda to 77 US-\$ in Egypt. The countries can be grouped into categories according to their farm specific milk prices:

Milk prices below 35 US-\$/100 kg ECM: PL, RS, BY, UA, AM, UG, UY, CL, IN, BD. In Uganda most of the milk is produced in the rural areas where there is no market for milk. Middlemen purchase milk from farmers at very low prices and make a big margin by selling directly to consumers in the urban areas.

Milk prices between 35-45 US-\$/100 kg ECM: Most countries in Western Europe and North Africa, CZ, ZA, USA, MX, PY, BR, AU.

Milk prices above 45 US-\$/100 kg ECM: Mainly NO, CH, FI, CA, which have highly protected markets; also found in RU, IL, JO, IR, EG, NG, CM. EU: The milk price in most EU countries was usually at the level of the world milk price. In 2010, the weighted milk price for EU was 40.4 US-\$ (1 US-\$ less than the world milk price). FI and IT had significantly higher milk prices. In the case of Italy, it is probably due to the fact that being a net importing country it could have an additional cost from milk transportation. On the other hand, prices were significantly lower in LU, UK and PL. In Luxembourg, the low price level in 2010 was a repercussion of the crises in 2009. The few, quite small, processors collecting milk in LU tried to maintain the milk price during the crises. However, now they have difficulties in raising the price while bigger companies with a more diversified production and different placements have more possibilities to do so. In the UK, one explanation for the lower price could be the large proportion of milk going into liquid markets. There was pressure in these markets during the latter half of 2010 due to competition amongst processors for large contracts to supply major supermarkets.

In Poland, the decline observed in the value of the PLN, which took place especially in the first half of 2009, meant that the prices of raw

milk in PL, expressed in Euros, were much lower than in other states and countries. The price differences between the Polish and the other member states in early 2010, returned to those observed before 2007, when they were 15% lower than the average in the EU-15 *(Olkowska, 2010).

In Russia, dramatic drought and fires caused reduction of milk production. In addition, the previous period with favourable consumer prices stimulated strong consumption growth. There was a great raw milk deficit in the second part of 2010 in RU which resulted in a rapid growth of the raw milk price. The milk price in the farms was also higher than national milk price because the farms had better quality milk, compared to the national average.

Price discrimination: Milk pricing systems vary in different countries and are a reason for some differences in milk prices. **Peru:** Larger farm participates in a school milk program offering a higher milk price. **Mexico:** Larger farm belongs to a dairy cooperative which pays a higher price for high quality milk. **Pakistan:** Smaller farms are usually in rural areas while larger farms are in urban areas which are closer to the market and have a higher milk price.

China: The CN-17 is part of a cooperative farm. The milk price represents the price farmers receive from the investor who has set up the farm infrastructure. The investor receives the price shown for farm type CN-340, which includes infrastructure depreciation, milking labour cost and bonus for scale.

Belgium: Small farmers have a lower price, because the dairy company charges more general costs (mainly transport and logistics) per litre to small farmers than to bigger farmers.

The Czech Republic: Domestic prices vary depending on the dairy company processing the milk. This variation could lead to a difference within a range of about 15 % of the milk price, depending on milk quality, product assortment, sales market and others.

Non-milk returns and decoupled payments

Milk yield vs non-milk returns: Farms with lower milk yield have higher non-milk returns, since these returns are expressed per 100 kg of milk (Africa, Asia).

Beef oriented and dual purpose farms have higher beef returns due to higher beef prices (Africa, NO, CH and BR-SE and BR-S).

Herd management: Calving interval, culling rate (IN, BD), age of selling calves (AU, NZ sell calves at 4 days old) which affect cattle returns.

Beef/heifer markets affect cattle returns: For example in Asia the high demand leads to high beef and heifer prices, hence higher cattle returns.

Highest non-milk returns >20 US-\$/100 kg milk in NO, CH, FI, AT (mainly from direct payments: see Chapter 1.10) as well as African farms from Algeria, EG, UG, NG, CM.

Lowest non-milk returns in AU, NZ, ZA, CA, UY, PY, CL, IN, PK. In India, for religious reasons, cow slaughter is banned which leads to low cull cow prices. In Chile and Paraguay, beef prices were low, partly because the low milk price pushed farmers to cull more cows which increased the supply of beef.

Explanation of variables

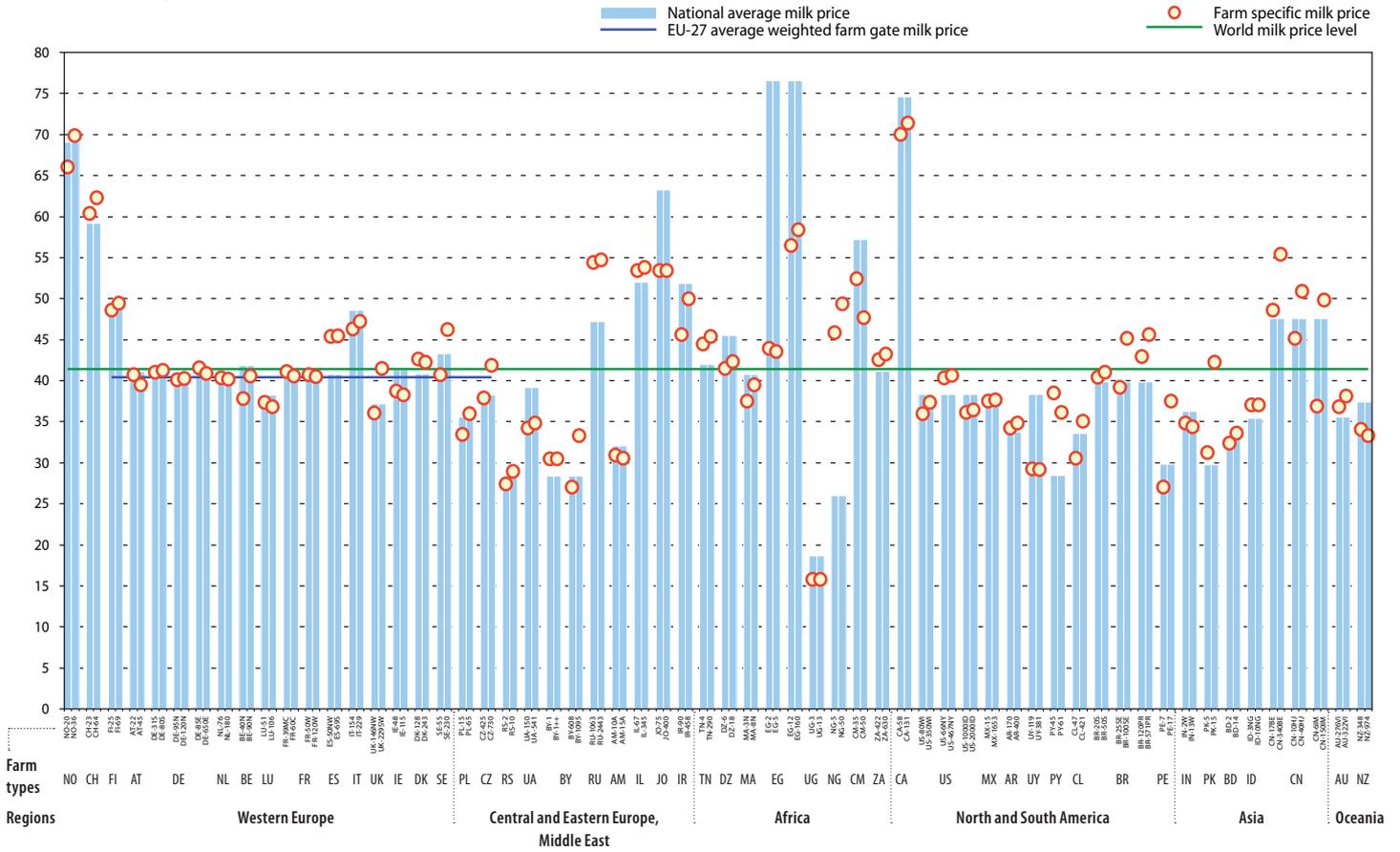
Farm codes: Example BR-20S = Brazilian 20-cow farm in Southern Brazil (details see Annex 5). **Year of data collection:** 2010; Uruguay, New Zealand, Australia = season 2009/2010, India = financial year 2010/2011. The farms from AM, IR, MA, DZ, TN, were analysed for the first time. Results should be treated with care.

Milk prices: Average milk prices (excluding VAT) adjusted to energy corrected milk (ECM 4% fat, 3.3% protein). *Olkowska O. 2010. Situation on the milk market in Poland in 2010, Polish Federation of Cattle Breeders and Dairy Farmers)

1.9 Returns: Milk price, non-milk returns and decoupled payments

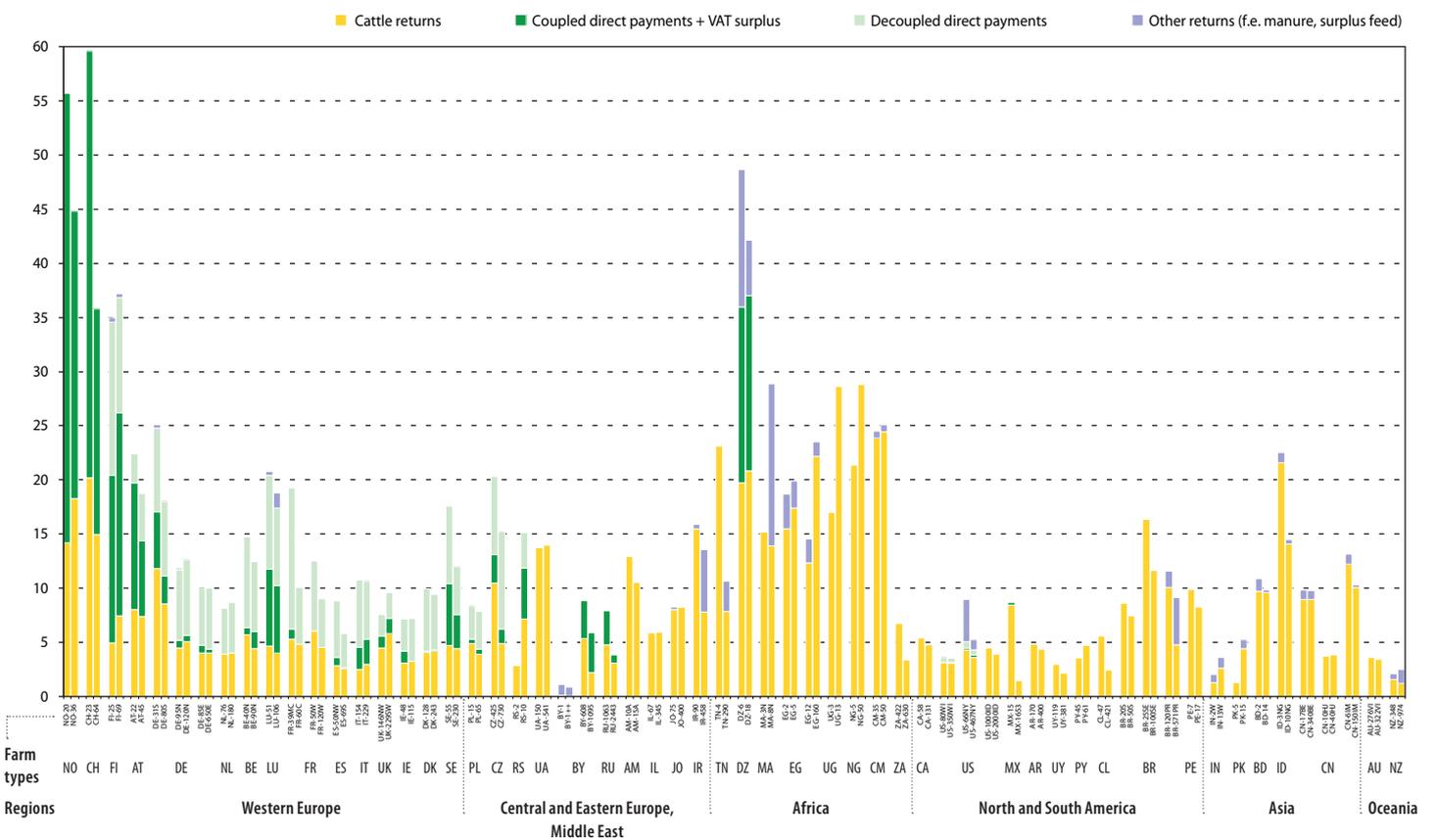
Milk prices in 2010

US-\$ / 100 kg milk (ECM)



Non-milk returns and decoupled payments

US-\$ / 100 kg milk (ECM)



1.10 Description of direct payments and policies

Background

The cash incomes of dairy farmers in the EU and in some other regions of the world are strongly influenced by direct payments. This chapter shows the different levels of these payments in the typical farms. Furthermore, as the handling of direct payments varies greatly from country to country, additional information about the payments is given. It must be taken into consideration that the policies are very complex and only a short overview can be given in this chapter.

Policies and direct payments in different countries in 2010

Direct payments include all cash transfers from the government to the dairy farms such as acreage payments, payments per kg milk, and payments per cow, fuel subsidy, social payments and special regional programmes. In most cases investment aid and interest subsidies have not yet been taken into account in the direct payments, as the data collection does not allow quantification at this stage.

Coupled direct payments vs. decoupled direct payments

All payments which are “coupled” to the milk production are considered as coupled payments. **Decoupled payments** exist in the EU and in Serbia. These are paid per ha as a direct aid to the farmer and not linked to the product which is produced. From this definition, decoupled payments cannot be directly allocated to dairy and are therefore not considered in the graphs in Chapter 1.7. Since they influence the income of farmers, they are shown here and in chapter 1.8 and for the first time in the farm income in Chapter 1.11. So as to be able to specify decoupled payments per kg milk on the charts, the decoupled payments have been allocated to the dairy enterprise based on the hectares of land the dairy enterprise is using or the alternative allocation concepts.

EU Situation 2010

In the EU, farmers receive two major types of payments: a) Coupled payments until 2013 and decoupled payments in terms of entitlements which are not linked to production b) special payments for sustainable farming which are also decoupled. Regarding decoupled payments (entitlements), farmers receive money based on the amount of cultivated land and payment rights per ha. If land is rented, the payment right is negotiated between the farmer and the landowner.

Regarding special payments for sustainable farming, farmers can join programmes for sustainable land management, consumer safety and animal welfare. Via these programmes, farmers receive money for special operations on their fields which protect the environment. Farmers must abide by several EU-regulations and a list of rules called “cross compliance” to obtain these payments.

By 2013 the coupled payments must be fully transformed into decoupled payments. In 2009, 87% of the direct support in the EU was decoupled and 13% of the direct support remained coupled.

The strategy of transformation is very different in each country of the EU. Some countries such as the Netherlands and Denmark already decoupled most of their payments, whereas other countries, for example Finland and Luxembourg, still have a high share of coupled payments. The coupled payments in Luxembourg are investment aids, electricity subvention, aids for paying a replacement in the case of the farmer’s illness or vacations, and aids in case of an emergency situation (low milk price, high feed costs).

Explanation of variables

Farm codes: Example BR-20S = Brazilian 20-cow farm in Southern Brazil (details see Annex 5). **Year of data collection:** 2010; Uruguay, New Zealand, Australia = season 2009/2010, India = financial year 2010/2011. The farms from AM, IR, MA, DZ, TN, were analysed for the first time. Results should be treated with care.

Exchange rate to US- $\$$: Average value for analysed time period. **VAT balance:** Farms that do not balance the VAT with the tax department have either a positive or a negative balance, which is income relevant. The surplus of the VAT is shown in one bar together with the coupled direct payments. **Source for payment policy information:** European commission, national data.

Levels of coupled direct payments

>15 US- $\$$ /100 kg milk (ECM): The highest coupled payments were received in the non-EU countries Norway, and Switzerland and the EU country Finland, where coupled payments still exist.

5-10 US- $\$$ /100 kg milk (ECM) coupled payments were found in Austria, Luxembourg, Sweden and Algeria.

<5 US- $\$$ /100 kg milk (ECM) most of the European countries were in this range, as well as farms in Belarus, Russia, United States, Mexico and Argentina.

Details on direct payments:

Norway: Area payments differ according to the region, the rate being highest for the first 25 hectares of grassland. Livestock payments and vacation payments (refund for actual expenses to farm workers) do not differ according to the region but rates are highest for the first animals. Structural income support for milk production: a payment per dairy cow up to the first five cows; payments for grazing livestock.

Switzerland: All direct payments are coupled to the agricultural use of land and to roughage consuming livestock units. Payments are connected to special requirements called »proof of ecological performance« (cross-compliance) and differ according to the region. Special programmes exist for animal-friendly housing, organic farming and ecological compensation areas.

EU: The following programmes are common: “organic farming” (AT, DK, FI, IT), “renunciation of means of production” (AT), “farming in less favoured areas” (AT, DE, ES, LU, SE, FR, CZ, PL, IT, NL), “grassland farming” (SE, FR, IT, DE), “nature protection” (LU, PL, CZ, DE, NL), regional milk quality programmes (ES), “slaughter payments” (ES, NL).

Germany - diesel subsidy: The German Government changed the subsidy for fuel used on farms due to the low milk prices in 2009. Before 2009 there was a flat payment of 1798€ per farm per year, independently of the quantity of diesel used. Since 2009, a payment of 0.215€ per litre is being made for diesel. In the case of the farm DE-95N, which uses about 15,000l diesel per year, this makes a difference of about +780€ coupled payments.

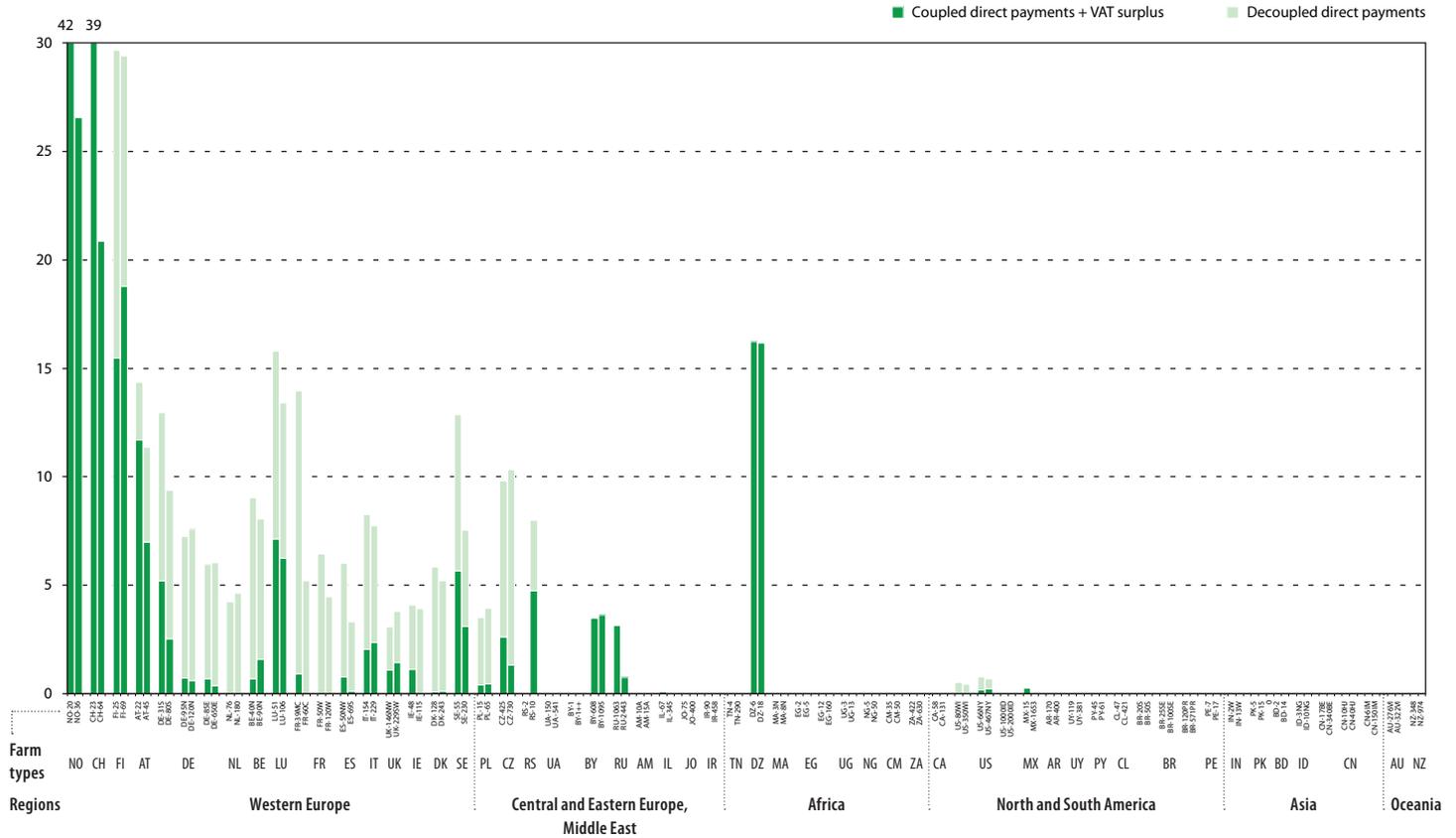
Serbia: Only registered farmers who pay social insurance can receive subsidies in Serbia since 2009. Those farmers who are registered receive subsidies for potential genetic improvement in cattle, which is paid from 4 up to 100 cows. A “milk premium”, is also paid per litre of quality milk (class I) which is sold to the dairy plant. To receive this payment they must deliver a minimum of 10,000 litres/year. Farmers who pay social insurance, which is not often the case, are eligible to receive an additional decoupled payment per ha (for up to 100 ha/farm) of agricultural land in use

Belarus: Milk producers receive about 0.5-1.5 US- $\$$ per 100 kg milk direct payments for the milk delivered to a dairy company.

Russia: Direct payments such as dairy and meat subsidies are paid whether milk or meat is delivered to the processor or not. Other programmes, including breeding, seed, fertilizers, investment subsidies etc., are paid from the federal budget. This depends on the area and the local government policy.

Direct payments

US-\$ / 100 kg milk (ECM)



USA: Dairy farmers in the USA are eligible to receive Milk Income Loss Contract (MILC) payments when prices fall below trigger levels. MILC payments are made on current production but limited to 1,350 metric tons per farm. Dairy farmers who produce corn for grain or silage may also receive decoupled direct payments based on the historical area harvested and the yield per hectare.

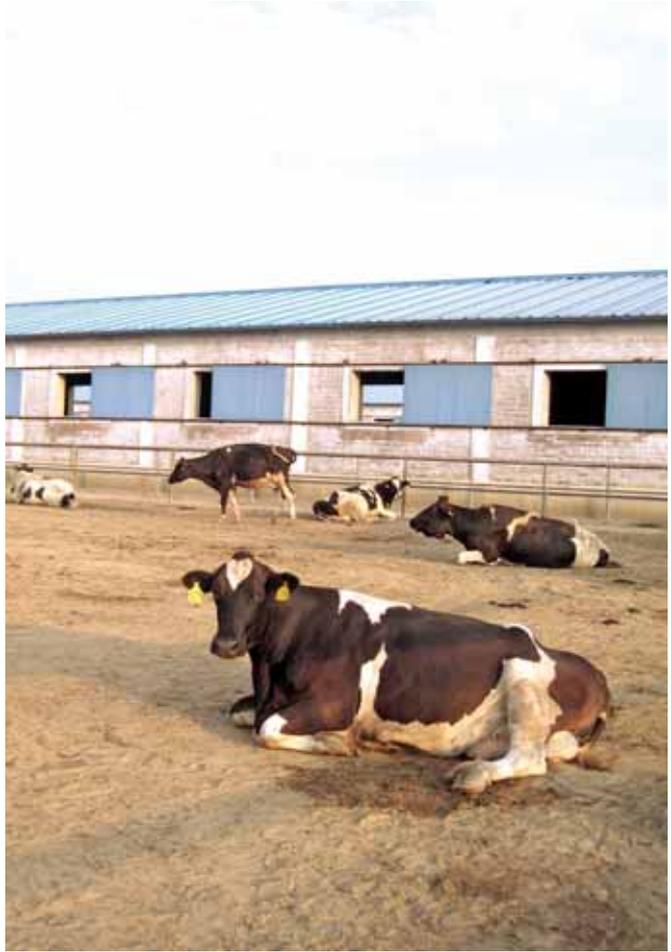
Algeria: The government gives 12 DZD (0.16 US-\$) per litre of milk for farmers, 5 DZD (0.07 US-\$) for collectors, 6 DZD (0.08 US-\$) for processors who use 100% fresh milk and 4 DZD (0.05 US-\$) for processors using less than 100% fresh milk.

Support for modernisation and investments in dairy farming

In some countries the government supports the dairy sector with investment aid or subsidised interest rates (in the cases of NO, CH, FI, AT, DE, NL, LU, ES, UK, IE, SE, PL, CZ, RS, BY, RU, IL, CA, US, DZ). However, there is a large variation in the type and level of support from country to country. In the new EU member countries there are several programmes for investment subsidies.

VAT system for dairy farms can have positive but also negative effects on farm incomes

In Austria, Germany, the Netherlands, Luxembourg, Italy and Ireland, farms can choose between keeping all VAT receipts as income and considering VAT expenses as costs or doing financial bookkeeping without VAT. In Switzerland the farms pay VAT for their inputs but do not receive VAT for their outputs. The VAT balance adds up to between -3 and +3 US-\$ per 100 kg milk.



1.11 Dairy enterprise: Profits and return to labour

Background

Chapter 1.8 shows the total costs of milk production and chapter 1.9 shows all farm returns. This chapter summarises the different profit levels for the farms. The advantage of these graphs is that they give an idea of the regions where farmers can be motivated, through a higher profit margin from the dairy business. **The farm income** indicator describes the income based on the profit and loss account, which is generated by the farm. On family farms this income is the basis for covering the family livelihood and capital growth. As from last year farm income, both including and excluding decoupled payments, was shown. The reason for this is that, in some countries, decoupled payments are also a strong determinant of farm profitability. **The entrepreneur's profit** shows whether the farms are able to cover their full economic costs. This means that all costs from the profit and loss account can be covered and family owned production factors (labour, land, capital and quota) can be paid at a market price (opportunity costs). If this is positive, a farming system is more sustainable financially. In addition, the **return to labour** shows how much profit an employee, or the farmer, generates per hour's work on the farm. A comparison made of the return to labour with the average wage level calculated per farm, gives an indication on how the farm is able to pay the labour it uses. A farm where the return to labour is lower than the average wage level calculated, may stay in business until a generation change takes place or as long as the farmers are satisfied with the wage level they generate.

Method

Farm income (without decoupled payments): Returns (excluding decoupled payments) minus costs from P&L account of the dairy enterprise. **Farm income (including decoupled payments):** Returns (including decoupled payments) minus costs from P&L account of the dairy enterprise. **Entrepreneur's profit:** Total returns (excl. decoupled payments) minus full economic costs (costs from P&L account + opportunity costs) of the dairy enterprise. **Return to labour:** Entrepreneur's profit plus labour costs divided by total labour input. To show the impact of decoupling, the decoupled payments per hour are shown in the graph on top of the – lower – return to labour. **Average wages on the farm:** This figure represents the gross salary plus social fees (insurance, taxes, etc.) the employer has to cover. See calculation details below. **Decoupled payments per hour:** Total decoupled payments of the dairy enterprise divided by total labour input.

Farm profit results

EU case: The EU farms are mainly family farms which are influenced by the quota system. In addition, due to the high input costs, the EU farms have the lowest entrepreneur's profit (without decoupled payments). Only the farms from Ireland and the larger farms in Eastern Germany, UK, Sweden and the Czech Republic were able to make a positive entrepreneur's profit (without decoupled payments). Almost all farms analysed made a positive farm income when all direct payments (coupled and decoupled) were considered. Without decoupled payments, farms in Denmark, the larger farms in France

and Poland, and the average farm in Sweden were not able to have a positive farm income. Farmers in the EU have been restructuring their businesses in response to these direct payments so they now rely on them, as the results for 2010 show. This makes them vulnerable to any future changes.

The most profitable farms are from Africa: Egypt, Uganda, Nigeria and Cameroon are the top countries in terms of entrepreneur's profit. These are mainly countries with grazing farms having very low input systems and making high returns from beef. Due to the fact that most of these farms are usually in rural areas with limited infrastructure, milk marketing could be a problem. In addition due to the low milk yields of these animals (<3000 kg/cow/year) and small farm size (<30 cows), the total farm income per year is not usually very high. However, supervised dairy cooperative development is an ongoing approach to ameliorate these problems.

Return to labour

For reasons of simplification, three levels based on the average wages on the farm in US-\$/hour can be described:

>15 US-\$/h: These are the farms in Norway, Ireland, Canada, Australia and New Zealand, and the larger farms in Eastern Germany, UK, Israel, USA, Argentina and Brazil, Parana region.

Between 5 – 15 US-\$/h: This includes farms in Austria, Germany, the Czech Republic, Cameroon, Uruguay, Chile, average sized farms in Switzerland, Finland and UK, and larger farms in Belgium, the Netherlands, France, Spain, Italy and Jordan.

<5 US-\$/h: This is the case in most countries in Africa, South America and Asia, as well as some CEEC countries where labour is much cheaper compared to the other regions.

Which farms are competitive on the local labour market?

These are the farms for which the return to labour exceeds the wage level calculated for this farm type. They include most of the farms in Africa, Asia, Middle East, Australia and South America, and also in Ireland, Armenia, and the larger farms in Eastern Germany, UK, Sweden, New Zealand, Canada and USA.

Top performing dairy farms in their regions based on return to labour input:

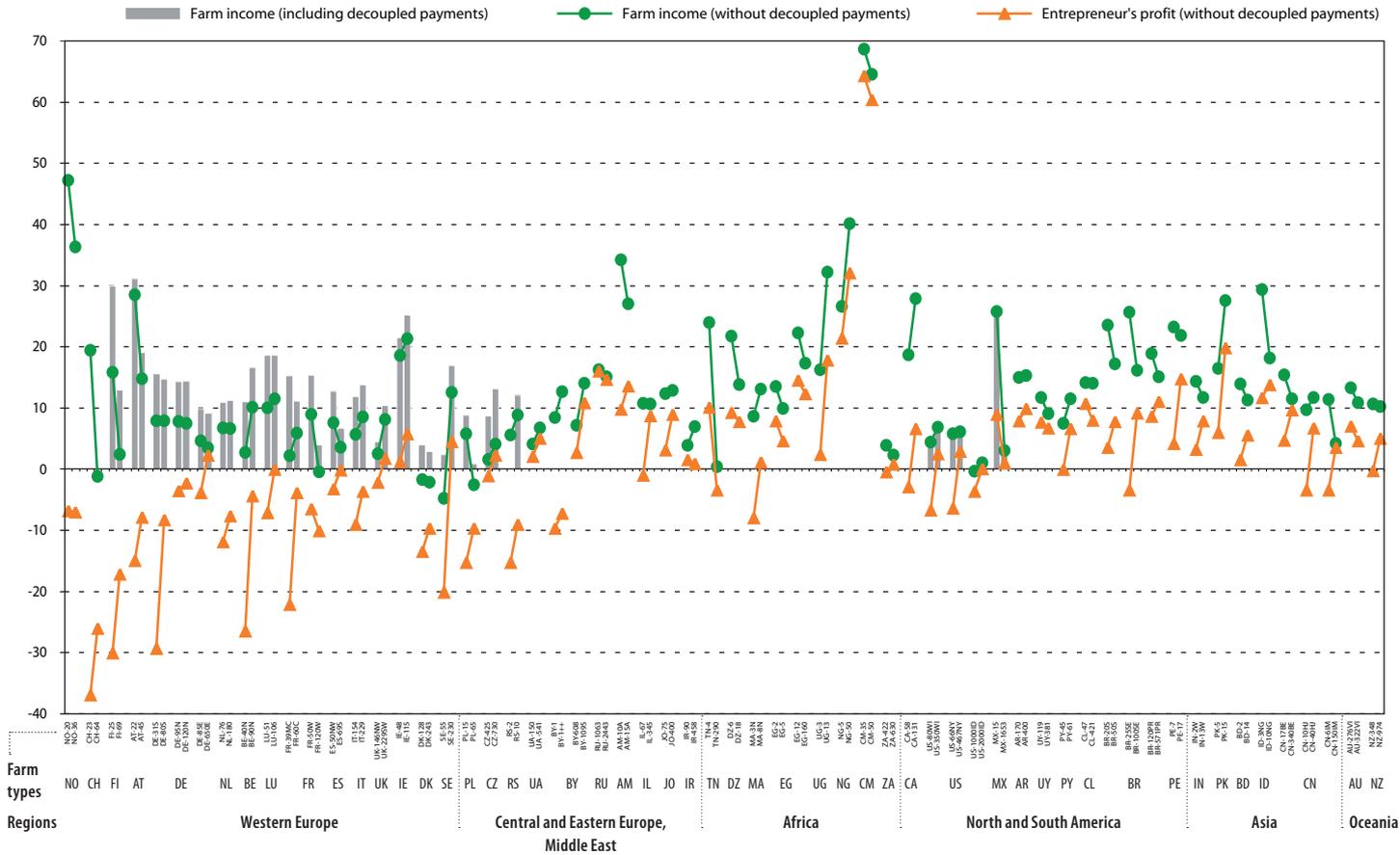
Western Europe: Sweden	230 cows	35 US-\$/h
CEEC: The Czech Republic	730 cows	9 US-\$/h
Middle East: Israel	345 cows	30 US-\$/h
Africa: Cameroon	50 cows	9 US-\$/h
North America: Canada	131 cows	31 US-\$/h
South America: Uruguay	366 cows	3 US-\$/h
Asia: China Heilongjiang	40 cows	3 US-\$/h
Oceania: Australia-Victoria	276 cows	47 US-\$/h

Explanation of variables

Farm codes: Example BR-205 = Brazilian 20-cow farm in Southern Brazil (details see Annex 5). **Year of data collection:** 2010; Uruguay, New Zealand, Australia = season 2009/2010, India = financial year 2010/2011. The farms from AM, IR, MA, DZ, TN, were analysed for the first time. Results should be treated with care. **Exchange rate to US-\$:** Average value for analysed time period. **Calculation of average wages on the farm:** Total labour costs (wages paid plus opportunity costs) divided by the total hours worked. For this calculation the number of hours worked by the employees and the family has been estimated by experts. Opportunity costs for labour: Time a skilled worker would need to do the job the different family members do, multiplied by the salary for a skilled worker in the country/region. Alternative option is to take the hours the family worked multiplied by the weighted average salary of the family members

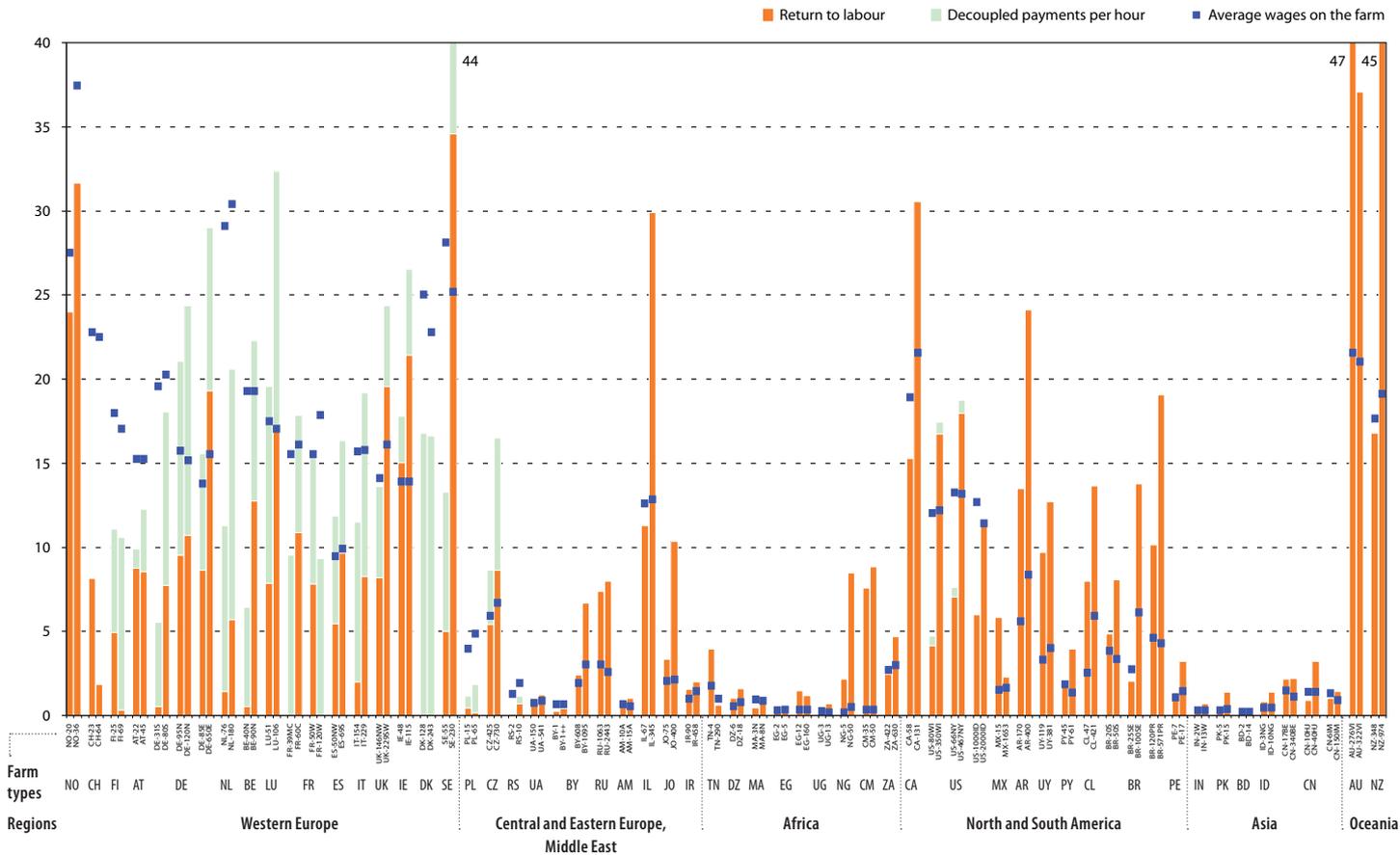
Returns and profits

US-\$ / 100 kg milk (ECM)



Return to labour

US-\$ / hour



Background

The asset structure and the return on investment analysis determine the returns the farmers have received from what they own, and can be a useful indicator to compare the profitability of investing in dairy farming around the world. In this report it is a historical measure so it cannot be used to determine where to invest, only where the best investments have been made. The capital stock explains the level of investments per 100 kg milk (ECM) to be made on a typical farm. The return on investment is shown in order to rank the farming systems from this perspective.

Method

Calculation of farm assets: Land, livestock, cooperative shares and quota by market price, machinery and buildings by book values.

Return on investment - operating (operating ROI): (Entrepreneur's profit without decoupled payments + estimated interests (on non-land, non-quota assets) + interests on quota + opportunity costs for land (by land rents)) / all farm assets.

Return on investment - assets (ROI of assets): Changes in asset values (from price changes for land, buildings, machinery, livestock, quota and shares in a cooperative) / all farm assets. This is a new indicator and the results should be treated with care. **Inflation rate:** Obtained from the International Monetary Fund.

Results on asset structure

An investment of 100 US-\$ is needed for production of every 100 kg of milk: This is the case in the CEEC, Middle East, Latin America as well as in Eastern Germany, Cameroon, South Africa, the USA and Australia.

Composition of assets

High share of land: Land assets represent an important part of the total assets and contribute to more than 40% of total assets in Oceania, USA and most of the farms in Western Europe, Latin America and Asia. Since rented land is not considered a farm asset, the farms which have a higher proportion of rented land also have a lower proportion of land assets. This is the case with the farms in the CEEC, Eastern Germany, France, Cameroon and Indonesia.

High share of livestock: Livestock values play an important role in farms which operate without any, or very little, owned land as seen in many farms in CEEC, Africa, Indonesia.

»Other« assets: In most farms this is circulating capital which can barely be seen in the graph. In New Zealand "other assets" mainly represent shares in the dairy cooperative Fonterra which accounts for 15 and 20% of the farm assets

High share of quota: Found in Norway, the Netherlands, Luxembourg, Canada and the larger farm in Israel, which is mainly due to the high quota value and the quota transfer systems in these countries.

Differences within one country

Germany: Farms are located in different regions and use different production systems.

Israel: Since 2008, cooperative farms have not been allowed to buy or sell milk quota. For this reason the milk quota value in IL-350 decreased to zero.

Tunisia: The land assets are higher in TN-4 compared to TN-290 due to the higher market value in the surrounding area of Tunis where TN-4 is based and a higher demand for land in the region.

Nigeria: The smaller farm is from a backyard dairy system with no grazing (no land input) and very few investments in machinery and buildings, while the larger farm is a grazing farm with more land, machinery and building investments.

India: The difference in asset input is driven by the production systems (with/without land).

China (CN-17): This farm has hardly any machinery or building assets of its own, as it is part of the cooperative CN-340, whose owner hires the dairy barn, provides the milking machine and also milks the cows of CN-17.

New Zealand: The land assets are higher in NZ-348 compared to NZ-974 due to a higher market value in Waikato where NZ-348 is based, and a higher demand for land in the region, not only for dairying, but also for other purposes.

Return on investment (ROI)

Since 2009, not only the ROI from operating business (operating ROI) but also the ROI from the assets' price changes (ROI of assets) have been calculated. Both figures presented on one chart give a good indication of the investment profitability in a certain farming system. There was a significant increase in asset values in many countries, notably Denmark, Israel, many Latin American countries and China. In some cases this added to the high ROI from operating, in others it compensated for low operating ROI. In some countries it was negative (e.g. Ireland) or zero (e.g. Oceania) indicating that adjustments to asset values have taken place.

Highest ROI – CIS, Africa and China: These are regions with very high return on investment (generally above 20%).

High ROI regions – Latin America, Middle East and Asia: Almost all these countries have a return on investment within the range of 10-20%. The exceptions are the Chinese farms with a higher ROI. The farm land of the cooperative is mostly provided by the local government. The family farmer (CN-17) and the investor (CN-340 owner) do not pay for the land at the market price. Therefore the dairy farm in China has a lower asset investment.

Moderate ROI in Oceania and North America: Here the farms have a positive ROI which is generally below 10%.

Lowest ROI – the EU: In these regions, it is generally close to or below zero since the calculation excludes decoupled payments.

Explanation of variables

Farm codes: Example BR-205 = Brazilian 20-cow farm in Southern Brazil (details see Annex 5). **Year of data collection:** 2010; Uruguay, New Zealand, Australia = season 2009/2010, India = financial year 2010/2011. The farms from AM, IR, MA, DZ, TN, were analysed for the first time. Results should be treated with care. **Exchange rate to US-\$:** Average value for analysed time period. **Method challenge 1 ROI:** Calculation of farm assets for Russia: The depreciation system is very complicated; investments in machinery and buildings were made many years ago and are already fully depreciated. For these reasons the value of buildings and machinery in assets tends to be underestimated.

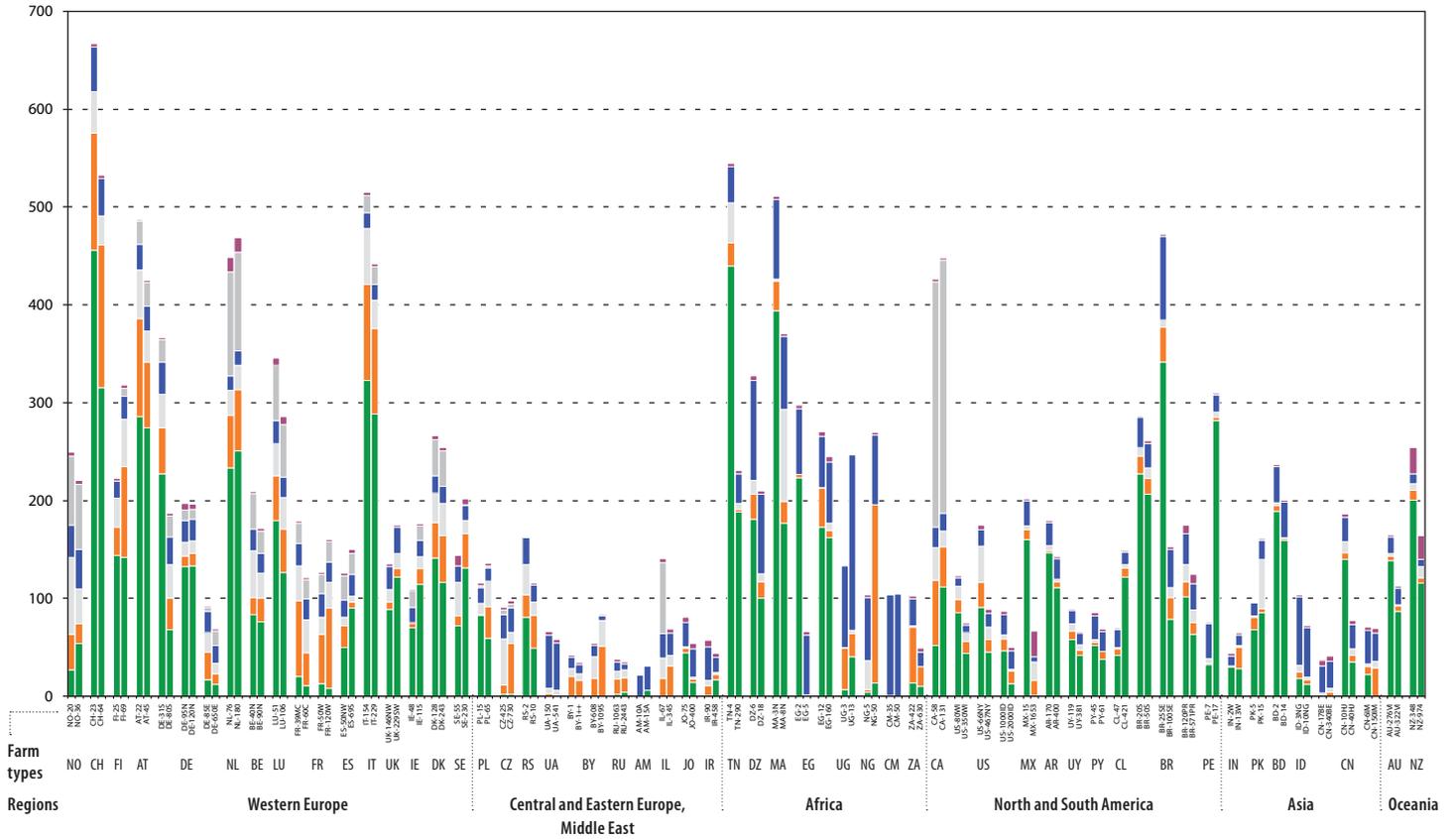
Method challenge 2 ROI: In farms with decoupled payments, the ROI calculated can be overestimated as these payments keep land prices at a high level.

Method challenge 3 Return to labour: Calculation of return to labour for farms with a negative entrepreneur's profit: The calculations in such farms give a negative return to labour and so far, only the decoupled payments per hour are shown.

Asset structure of the dairy enterprise

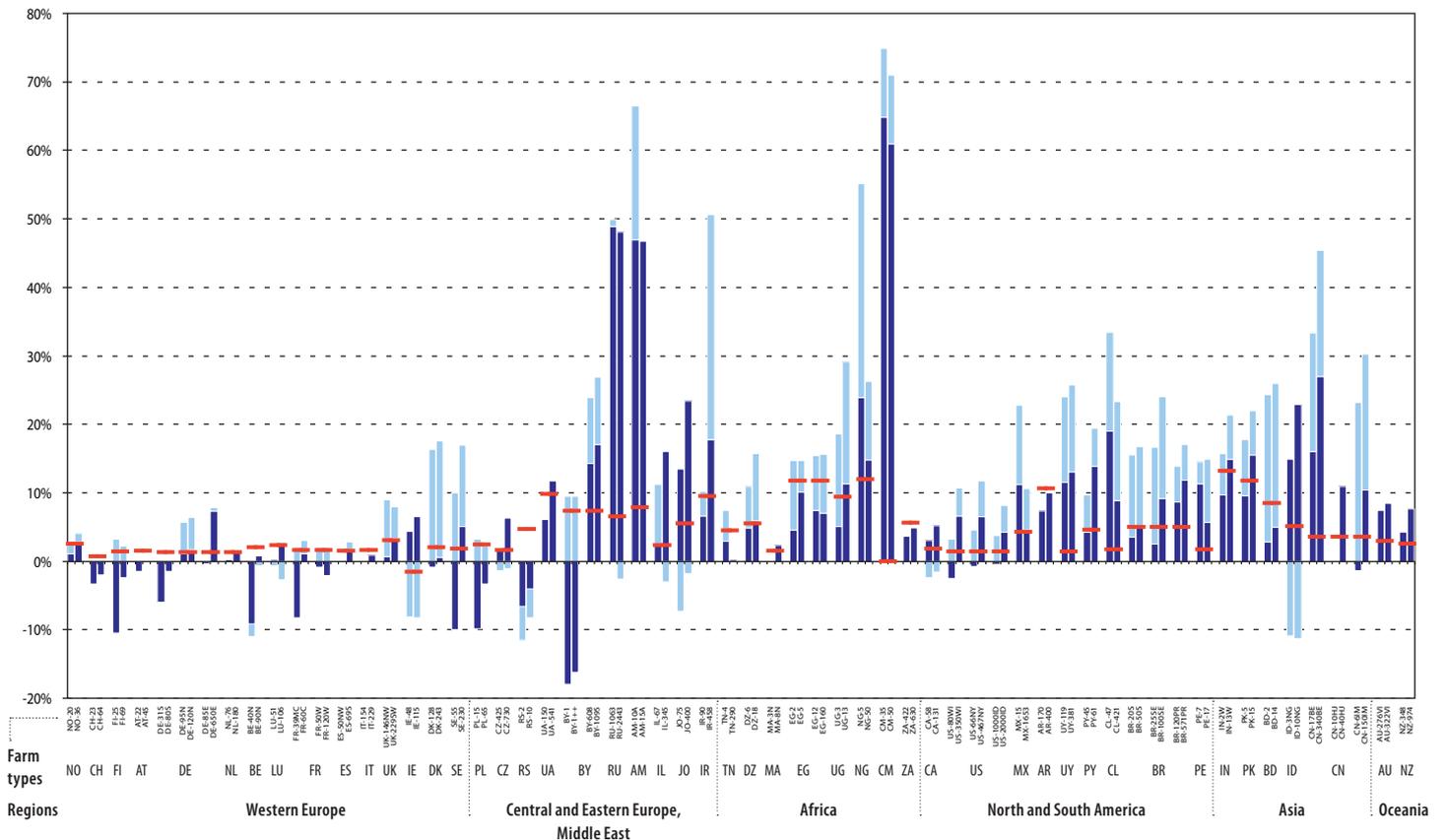
US-\$ / 100 kg milk (ECM)

Land Buildings Machinery Livestock Quota Other



Return on investment

ROI operating ROI assets Inflation rate

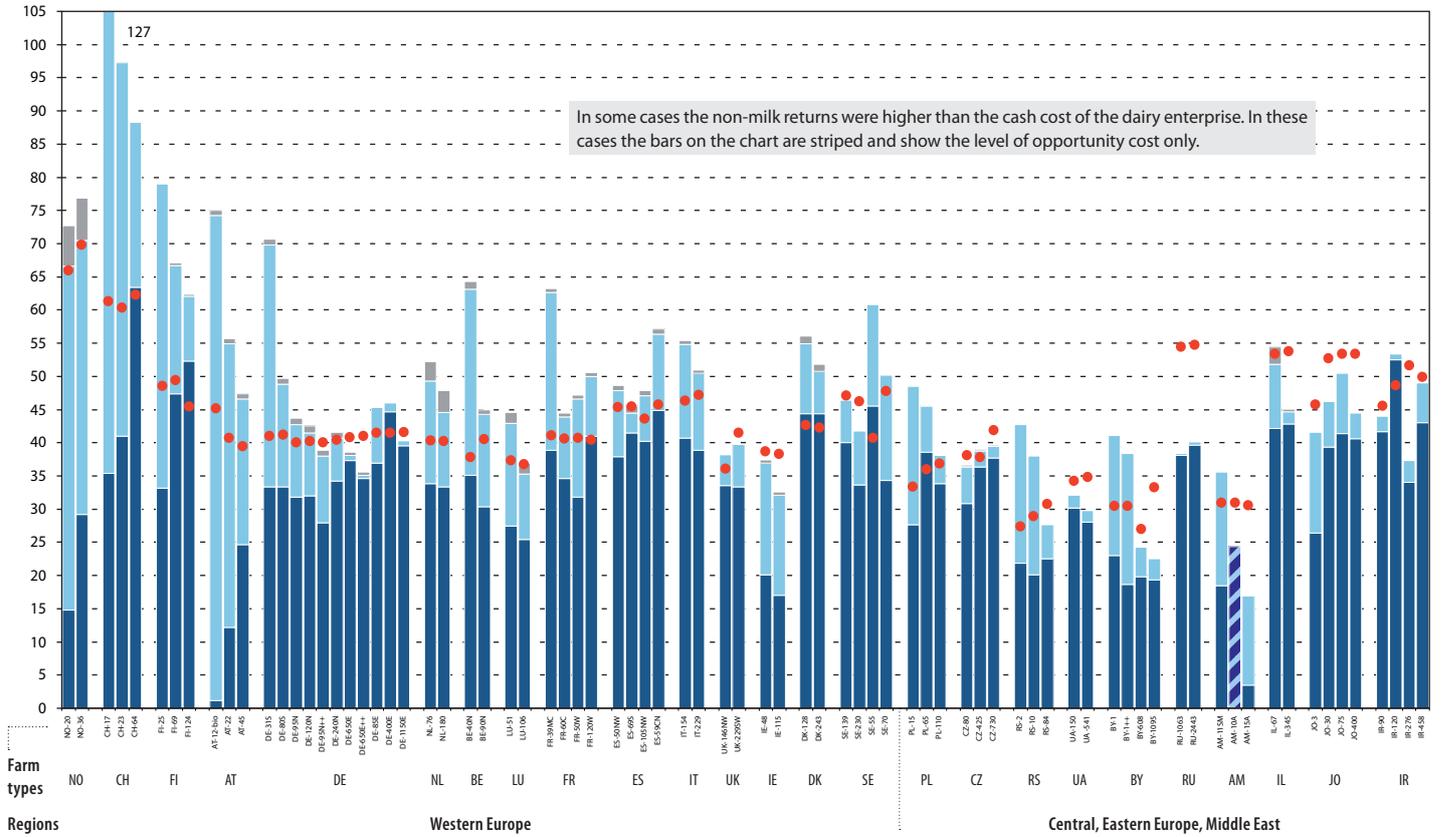


1.13 Overview of all typical farms analysed - costs and returns

Cost of milk production only

US-\$ / 100 kg milk (ECM)

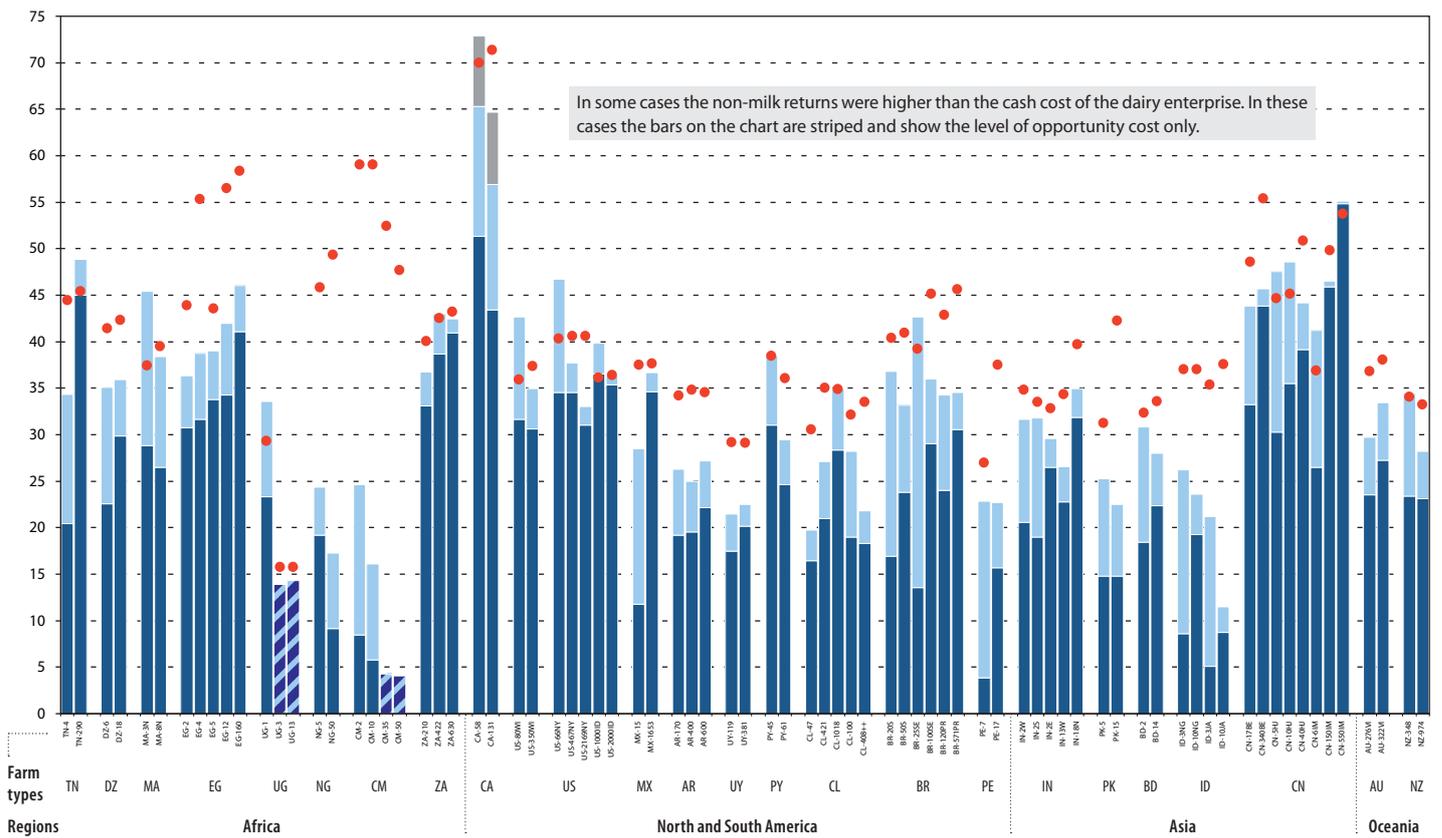
■ Cost from P&L account - non milk returns ■ Opportunity costs (excl. quota) ■ Quota costs (rents and opportunity costs) ● Milk price



Cost of milk production only

US-\$ / 100 kg milk (ECM)

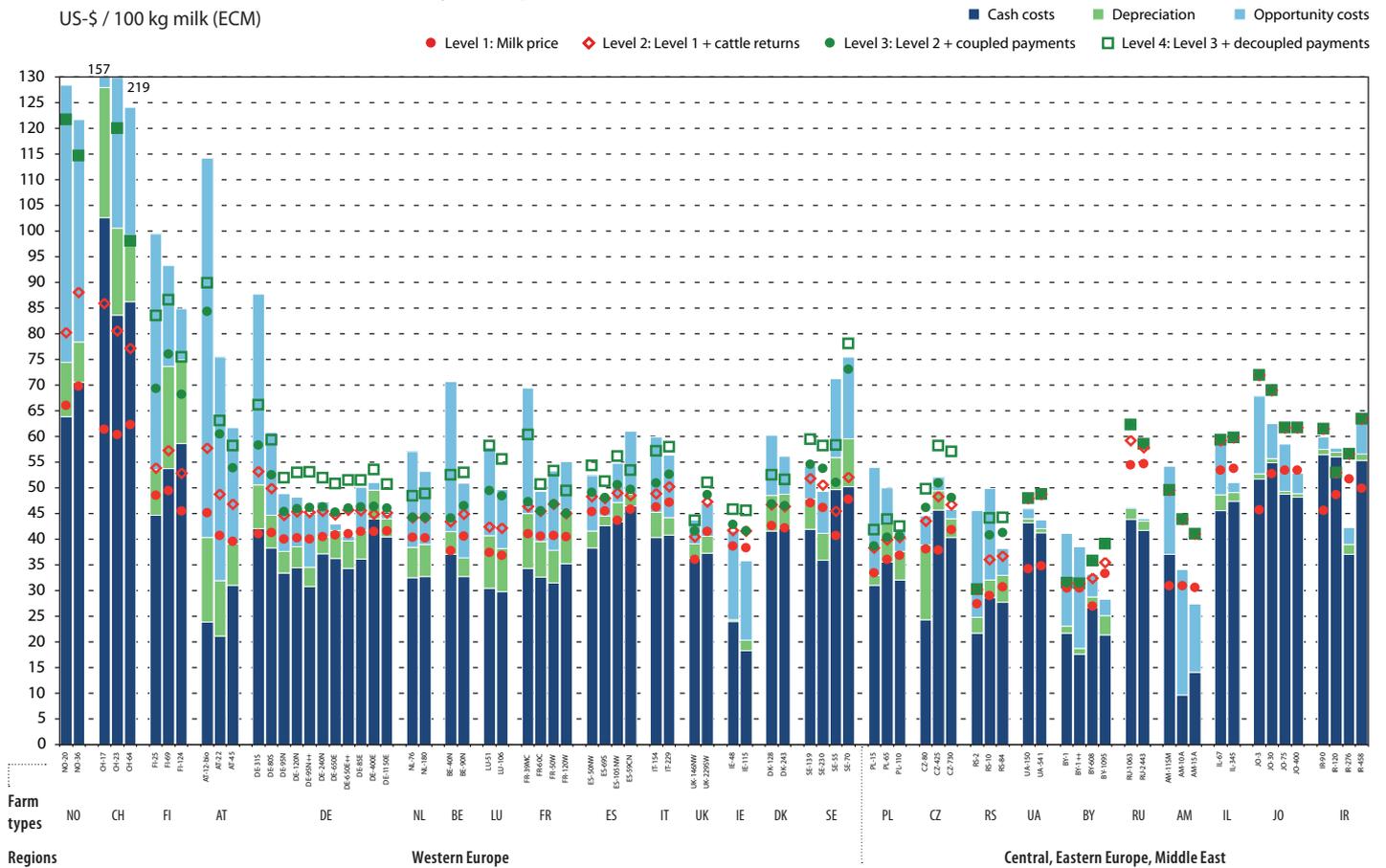
■ Cost from P&L account - non milk returns ■ Opportunity costs (excl. quota) ■ Quota costs (rents and opportunity costs) ● Milk price



1.13 Overview of all typical farms analysed - costs and returns

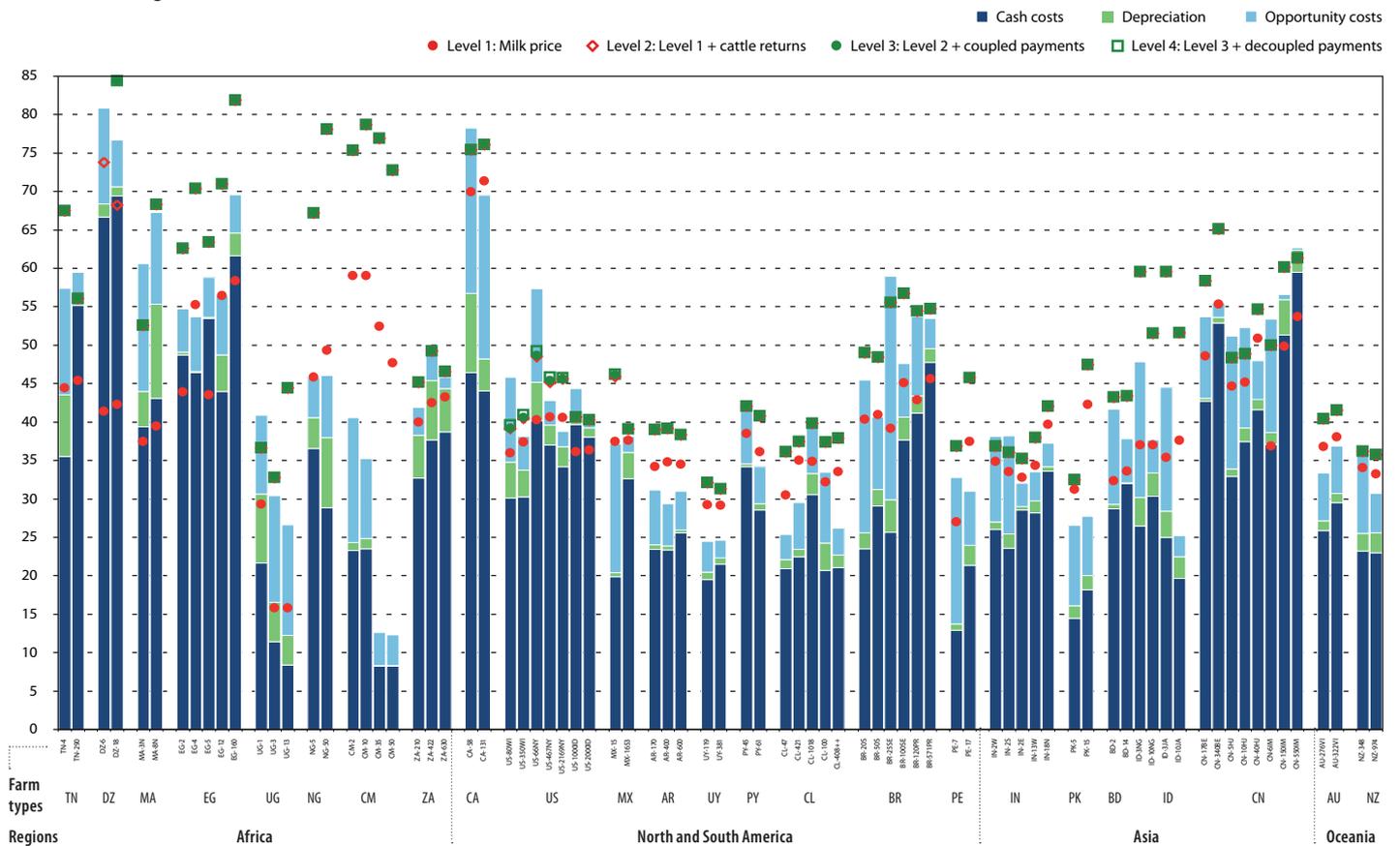
Total costs and returns of the dairy enterprise

US-\$ / 100 kg milk (ECM)



Total costs and returns of the dairy enterprise

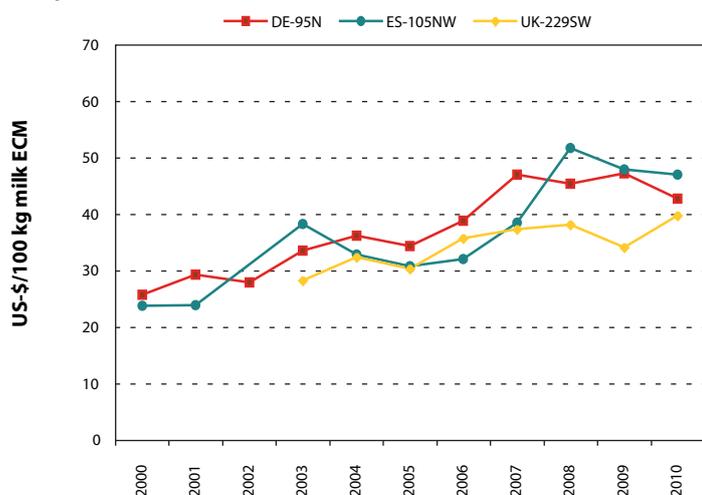
US-\$ / 100 kg milk (ECM)



1.14 Time series analysis 2000-2010 at farm level

Cost of milk production only

Europe



Germany: The 95 cow farm from Germany showed a continual cost increase until 2007, mainly driven by the strengthening of the Euro and decoupling of direct payments. Since 2008 its cost has decreased, mainly due to lower feed cost, based on lower concentrate prices.

Spain: The Spanish farm had one cost peak in 2003 and a second in 2008, when milk prices were also high. The lower costs between both peaks were mainly based on a higher labour and land productivity. In the last two years, cost decreased based on lower land and labour prices.

UK: The cost of the dairy farm in the UK rose to 40 US-\$/100 kg milk in 2010. Declining land costs since 2006 have compensated a continually increasing labour cost.

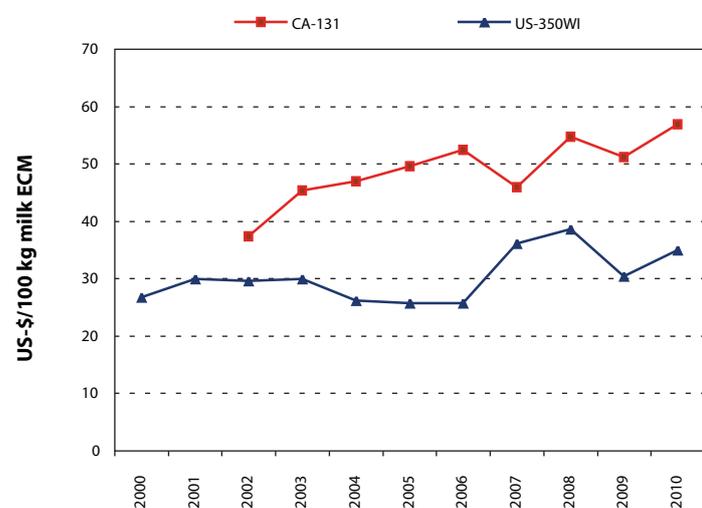
Central and eastern european countries



Poland: The cost of the 65-cow Polish farm increased rapidly until 2007. The main drivers were a strong appreciation of the Zloty to the US-\$, rising land and labour prices. Feed costs which increased from year to year led to a peak in 2008. For the last two years the Zloty has gained value and feed and land cost have decreased, which led to lower cost.

The Czech Republic: Also in the Czech Republic increasing land and labour prices led to higher costs until 2008, in addition to the currency appreciation to the US-\$. The cost decrease in the Czech Republic in 2009 and 2010 was driven by revaluation of the Czech Crown and lower capital costs.

North America



Canada: Cost has increased in US-\$ terms. In national currency the costs were constant. Increasing labour and land cost were compensated by a higher productivity which kept the cost more or less constant. The cost increase is only driven by the exchange rate to the US-\$.

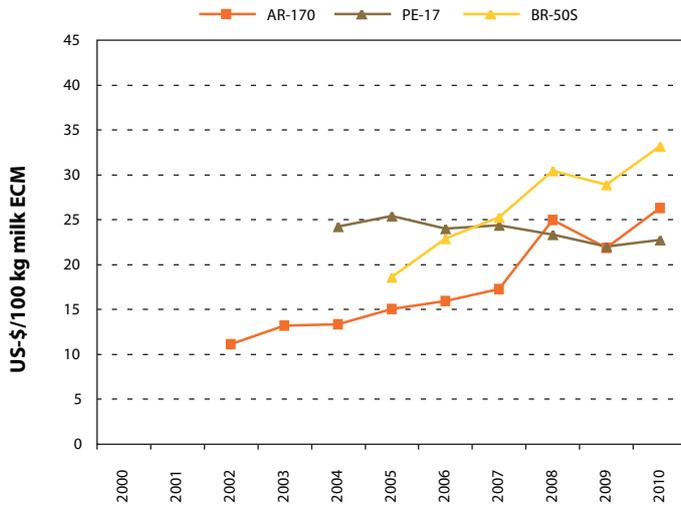
In **USA**, costs were relatively stable from 2000 to 2006, but increased sharply in 2007 and 2008 due to higher feed prices. In 2009, prices for feed and other inputs (fertilizer, fuel, etc.) fell, which, along with cost cutting measures in response to very low milk prices, led to lower cost of milk production. In 2010, prices for feed, fuel and fertilizer increased once more and so did the total cost.

Explanation of variables:

Cost of milk production only is the sum of costs from profit and loss account and opportunity costs minus non-milk returns. All costs are in US-\$ with the value in each year. The results may differ slightly from the previous Dairy Reports. The TIPCAL model has been improved and some farm data have been corrected after the publishing of the earlier Dairy Reports. Moreover, in some cases "jumps" in costs were caused by changes in herd size on farms or improved panel/data sets. Farm codes: PL-65 = Polish farm with 65 cows

Cost of milk production only

South America

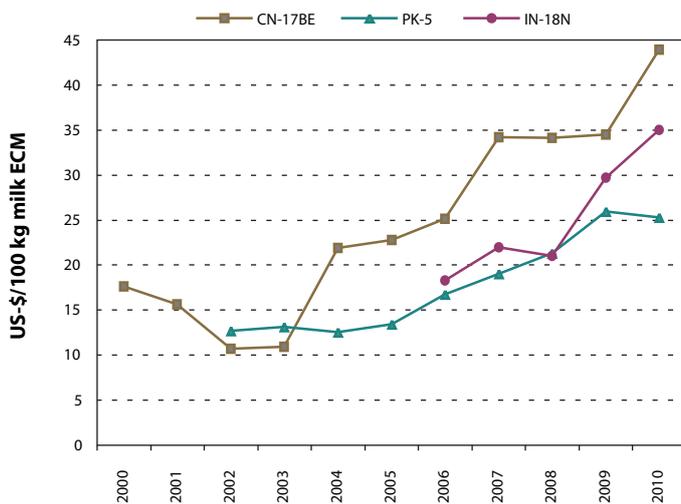


Argentina: The costs of the 170 cow farm of Argentina have more than doubled in the last 8 years. The main reasons were increasing prices and costs for land, labour and feed. In the last two years there was a devaluation of the Peso which led to a lower cost in 2009. However, in 2010, there was a lower devaluation than in 2009 and its effect was over compensated by a higher price increase for land and labour

In **Peru** prices for land, labour and feed have decreased in the last few years. The appreciation of the Peruvian currency was not able to change this trend.

In **Brazil** costs for land, labour and feed have increased during the last few years. The appreciation of the Brazilian currency further increased the cost in US-\$ terms. The lower milk prices in 2009 probably influenced the reduction of cost in the same year in all three countries.

Asia

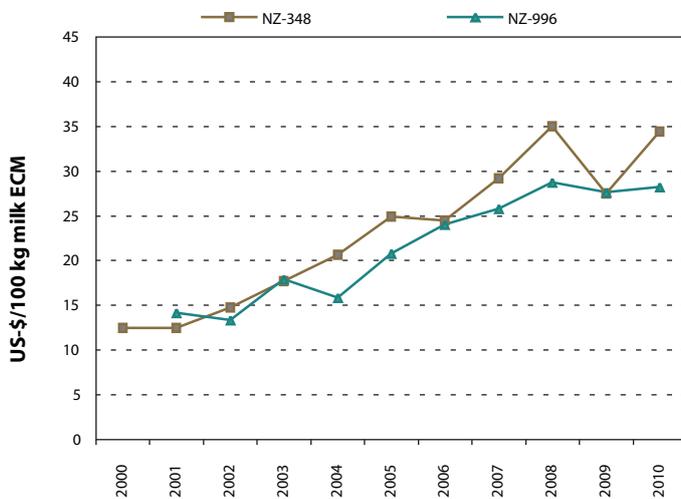


China: The cost of production on Chinese dairy farms has tripled in the last 10 years. From 2000 to 2003 it was around 15 US-\$/100 kg milk. The 2010 cost reached 45 US-\$/100 kg. A great increase in feed and labour prices led to a high feed and labour cost. In addition, the Yuan has gained value to the US-\$ since 2006.

Pakistan also showed an increase in the cost from 13 US-\$/100 kg in 2002 to 25 US-\$/100 kg in 2010. Rapidly increasing land, labour and feed prices were drivers for this cost development. In 2010 the cost increase was lower than in the previous years. A revaluation to the US-\$ was not able to compensate the cost increase.

The cost in **India** also increased from 20 US-\$/100 kg to 35 US-\$/100 kg in the last 4 years. The main driver of this development was increasing feed and land prices.

Oceania



New Zealand farms adjust their cost of production to the price they receive for milk. As milk prices have trended up, albeit with some volatility, so also has the cost of production, threefold. The key drivers were the strengthening of the currency (35%) and the increase of key input prices such as land and labour. In 2009, the cost dropped significantly, mainly due to devaluation of the currency. The drought in 2010 led to a lower milk yield of the 348 cow farm, which increased their cost. The 996 cow farm is irrigated, so was less affected by the 2010 drought and was able to keep the costs constant.





International Farm Comparison Network





Previous and this double page: IFCN Dairy Conference 2011

Chapter 2

Authors: Eva Schröder-Merker, Mikhail Ramanovich, Karin Wesseling with the contribution from researchers mentioned on page 2-3 of this report

Global monitoring dairy economic indicators 1996-2010

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2.2 Global trends in oil, milk and feed prices 1981-2011	42
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2.7 Monitoring milk : feed price ratio 1996-2010	52



Introduction

The aim of this chapter is to monitor the development of the dairy chains, and define trends and drivers.

World market prices for oil, feed and milk

The analysis in chapter 2.2 shows the price developments for oil, feed and milk, annually for the time frame 1981-2011, and monthly for the time frame 2002-June 2011. It becomes clear that all prices followed a similar pattern and that they were at record high levels in the years 2007 and 2008. Moreover, all prices declined sharply after the peak to a comparatively low level in 2009. In 2011 oil, milk and feed prices are even higher than in the historical peak. In 2010 oil and milk prices were already on a high level, whereas feed prices increased only marginally. From the second half of 2010 to April 2011 oil and feed prices increased almost at the same speed as in 2007 / 2008. Also the milk price increased around the turn of the year, but rather representing a level-shift from 43 to 51 US-\$/100 kg milk.

World milk price trends

The IFCN milk price indicator, based on SMP and butter prices, left the long-term price range of 11-25 US-\$/100 kg milk in 2007. Following the historical high peak at the end of 2007 there was a sharp decline to 20 US-\$/100 kg at the beginning of 2009. In September 2009 the world milk price began to increase once again. In 2010 the milk price fluctuated on a high level between 36 and 45 US-\$/100 kg milk. After a price increase of about 8 US-\$/100 kg milk at the turn of the year, the milk price was at a price level of 51 US-\$/100 kg milk for the first six months of 2011.

Drivers for the strong milk price increase from midyear 2007 to mid 2008: Reasons for the sharp world milk price increase in 2007 were a high demand growth for milk in combination with low stock levels. Drivers of this development were also a lower production in main exporting countries such as Argentina and Australia due to weather conditions, thus lowering export supply.

Drivers for the milk price decrease in 2008 and the low price level in 2009: It was driven by the positive attitude of farmers following the high price period, which led to higher milk production and an increased delivery to dairies. The positive supply development contrasted with a lower demand as an effect of the worsening global economic situation and Melamine Crisis. The surplus was compensated into higher stock levels e.g. in the EU, New Zealand and Australia.

The effects of the global economic crisis kept prices down in the first half of 2009.

Drivers for the price increase at the end of 2009 and the high price level in 2010: This was, on the one hand, a result of limited supply as a reaction to poor farm economics the previous year and the El Niño Effect which led to a slowdown in production growth in 2009. On the other hand, there was a recovery of the general demand after the global financial crisis (+18 mill t). Furthermore, there is an ongoing high demand from China on the world market, since the Melamine Crisis in 2008 caused distrust of the national dairy sector and extensive structural changes, which are not completed to date.

National milk price trends

The analysis in chapter 2.3 and the graphs in chapter 2.4 illustrate that in about 65% of the countries the national milk price reflected the increasing world milk price trend in 2010. In contrast, the decreasing world price trend in 2009 was reflected by over 85% of the countries. There was a difference in the degree and timing of price transmission from world to national markets.

Monthly milk price transmission

The graphs in chapter 2.5 illustrate the price transmission from world to national markets on a monthly basis, the absolute distance of national milk prices in relation to the world market price and key facts. The degree of connection to the world market as well as the price patterns varied greatly from country to country.

National feed price trends

The analysis in Chapter 2.6 shows that national feed prices increased in 2/3 of the countries. The world market price increased by 2.6%, after the strong decreasing world price trend in 2009 which was reflected by over 90% of the countries.

The milk : feed price ratio

In 2010 the world milk : feed price ratio increased to 1.8. About half of the countries reflected this trend by increasing national milk : feed price ratios. In simple terms a high milk : feed price ratio provides opportunities for high yield farming systems. Once the milk : feed price ratio is below 1.5, low input farming systems with moderate yield levels become more favourable.



2.2 Global trends in oil, milk and feed prices 1981-2011

Introduction

This chapter aims to illustrate the long term price trends relevant to milk production in the world.

Annual world market prices in US-\$

Oil price

In 2011 the oil price is 111.9 US-\$/barrel (data available till June), up from 79.6 US-\$ in 2010, and 15% above the historical high price of 2008 (96.8 US-\$/barrel). It is far beyond the level of the 1980s and 90s, which was on average 21 US-\$/barrel.

Feed price

From 1981 to 2006 the world feed price was on average 13.8 US-\$/100 kg feed, but with strong fluctuations ranging from 10.8 to 19.5 US-\$/100 kg feed. From this level the price increased by 86% in two years, from 14.3 US-\$ in 2006 to 26.7 US-\$ in 2008. In 2009 the price fell 16% to 22.4 US-\$/100 kg feed. The price in 2010 increased only slightly by 3% to 23.0 US-\$/100 kg feed. However, in the first six months of 2011 it increased strongly by 43% to an average of 32.8 US-\$/100 kg feed, above the historical high of 2008 (26.7 US-\$/100 kg). The calculated IFCN feed price indicator is based on 70% corn (energy feed) and 30% soybean meal (protein feed).

Milk price

The world milk price has shown strong fluctuations over the years. These ranged from 8 to 46.2 US-\$/100 kg milk in the period analysed of 1981-2010. The historical peak in 2007 which showed a 100% increase in one year was followed by a strong decrease to 26.2 US-\$ in 2009. In 2010 the milk price was 41.3 US-\$/100 kg milk, just above the 2007/2008 level. In 2011 (data until June) the average milk price is 50.7 US-\$/100 kg milk, and, in the same way as oil and feed, is above the historical high of 2008. The IFCN milk price indicator is based on butter and SMP prices, processing cost assumptions and technical coefficients for butter and SMP.

In the period 1981-2011 a number of fluctuations were observed.

Lower price levels were observed in: 1986, 1990, 1999, 2002 and 2009

Higher price levels were found for: 1989, 1995, 2001, 2007, 2010 and 2011

Monthly world market prices – oil, feed, milk

The monthly **oil price** development was characterised by a strong increase until the historic peak in July 2008 (132.7 US-\$/barrel), which was followed by a rapid decrease to the bottom level of 40 US-\$/barrel in December 2008. In 2009 and 2010 the price recovered, increasing to a level of more than 110 US-\$/barrel in the first six months of 2011. After the peak in June 2008 (33.2 US-\$/100 kg feed) the **feed price** decreased strongly but not to the same extent as the oil price. In 2009 and until June 2010 the price stabilised in the low 20s. Then this trend reversed and increased to over 30 US-\$/100 kg feed in the first six months of 2011.

The monthly **milk price** reflects the high price period of 2007 and 2008 with its peak in November 2007 (58.2 US-\$/100 kg milk). In 2009 the milk price fell during some months to the levels of 2006 (~20 US-

), but strong increases in the second half of the year led to a higher average price in 2009. In 2010 the price was stable compared to the previous three years, fluctuating on a high level. The first six months of 2011 show again a fluctuation on a high level, from 48.5 in January to 52.1 in June, following a price hike of another 5 US-\$/100 kg milk from December 2010 to January 2011.

Summary of global price developments

The three observed commodities have similar price development patterns which are characterised by strong fluctuations especially in recent years. In spite of this correlation there is no statistically proven causality in these developments. After high prices in 2008, which the world milk price had already reached at the end of 2007, prices decreased strongly in 2009. In 2010 prices were, once more, on a higher level for oil and milk. The price for feed seemed to become stabilised from the second half of 2009 through 2010. However, in the first six months of 2011 all three commodities are on average at an even higher price level than the historical high levels of 2007 and 2008.

Dairy commodity developments

The different dairy commodities traded on the world market (mainly butter, powders and cheese) generally follow similar price development patterns albeit on different levels. The world market trend shown in the IFCN milk price indicator is based on skim milk powder and butter, the latter being traded at a premium price compared to other dairy products in 2010. The IFCN is working on a new milk price indicator, which combines major dairy commodities and takes into account their respective shares in the world trade with dairy products.

Global milk : feed price ratio

The milk : feed price ratio indicates how much feed a dairy farmer receiving global milk prices and paying global feed prices can buy, after selling one kg milk. The ratio is considered as favourable, when it is 1.5 and generally one can conclude that the higher the ratio, the more favourable intensive feeding is considered. From 1981 to 2007 it increased from not favourable 0.7, to favourable 2.4. After 2007 the ratio decreased to 1.2 in 2009 but returned to 1.8 in 2010, a level similar to that of 1995, 2001 or 2005. Rising milk prices in 2011 in combination with a higher feed price made the ratio decrease to 1.5.

Favourable periods were observed in: 1995, 2000, 2001, 2005-2007, 2010, 2011



Explanation of variables

2011*: January-June 2011.

Oil prices: Energy Information Administration and Association of the German Petroleum Industry. Prices in US-\$/bbl: US-Dollars per oil barrel.

IFCN feed price indicator: Source: International Monetary Fund. Specification: Soybean meal: CME futures first contract forward, Corn: FOB US Gulf.

Calculation: 0.3 kg soybean meal price + 0.7 kg corn price.

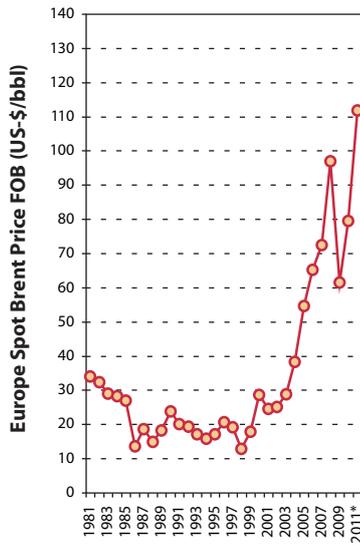
IFCN milk price indicator: Source: USDA. Specification: Oceania prices: SMP (1.25% fat), Butter (82% fat).

Calculation: ((butter price - processing costs)/technical coefficient for butter + (SMP price - processing costs)/technical coefficient for SMP)

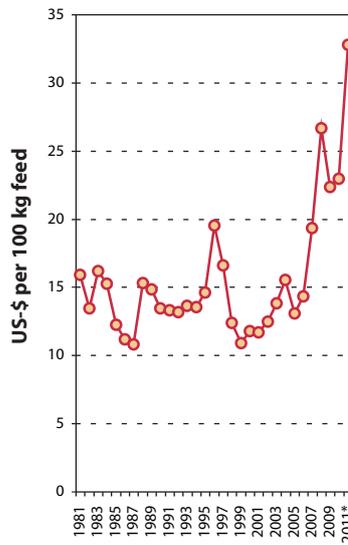
Exchange rates: Oanda.

World oil, feed and milk prices in US-\$ and Euro - yearly 1981-2011

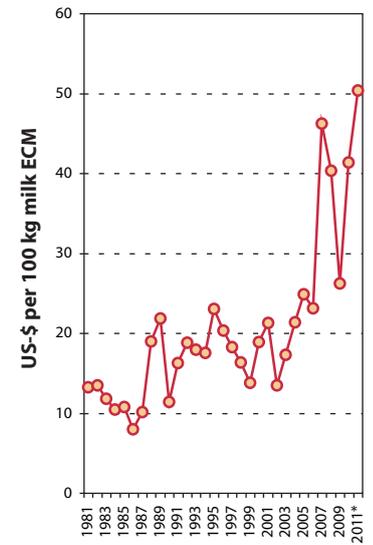
World oil price



World feed price

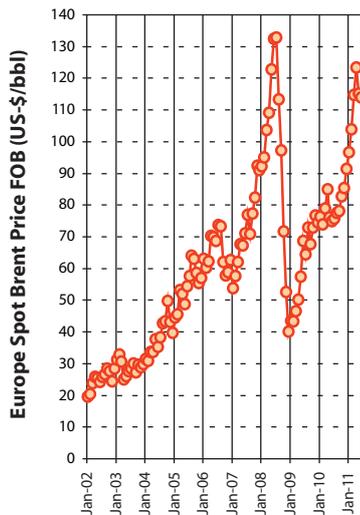


World milk price

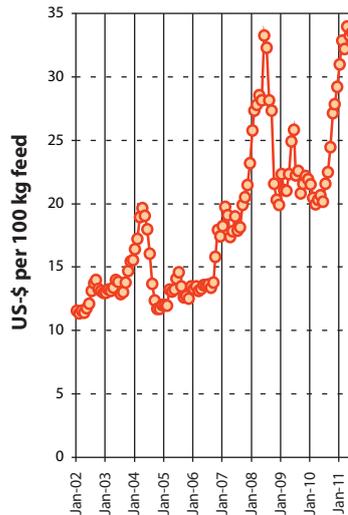


World oil, feed and milk prices in US-\$ and Euro - monthly from January 2002 until June 2011

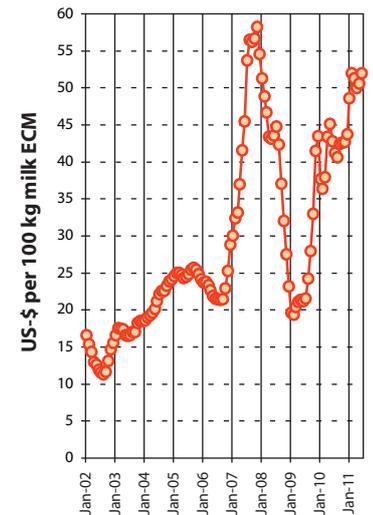
World oil price



World feed price

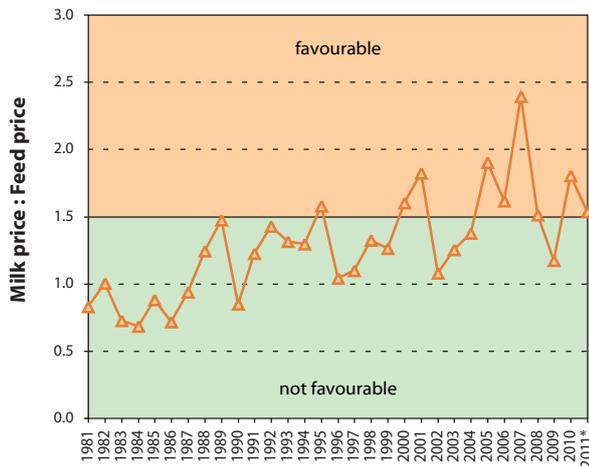


World milk price

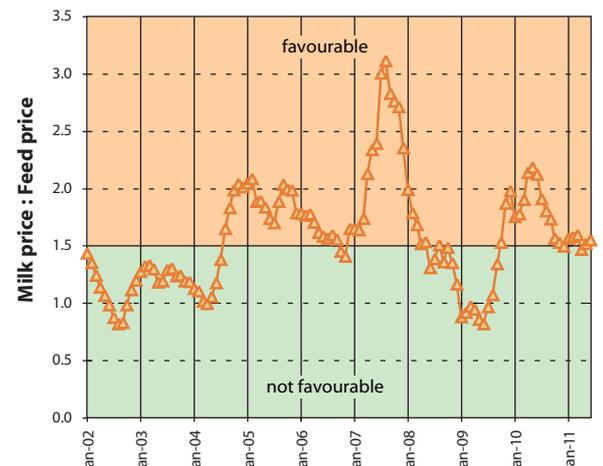


World market: Milk : feed ratio

Yearly data 1981-2011



Monthly data January 2002-June 2011



2.3 Milk prices in 2010 in US-\$

General remarks

This chapter illustrates the status of the milk price in US-\$ in 2010 for 90 countries and their changes from 2009 (in the world maps more countries are included). Detailed milk price developments 1996-2010 per country are shown in chapter 2.4. It is important to note that exchange rate trends have effects on price developments when considered in US-\$ or national currency.

Milk price in 2010 in US-\$

In 2010 the world market price of milk was 41.3 US-\$/100 kg ECM, which is 15.1 US-\$ or 58% higher when compared to 2009. Milk prices per country ranged from 18.7 US-\$/100 kg ECM in Uganda to 102.4 US-\$/100 kg ECM in Japan and can be grouped into the following categories:

- < 30 US-\$: Belarus, Jamaica, Kenya, Nigeria, Pakistan, Peru, Serbia, Uganda
- > = 30 < 35 US-\$: Argentina, Armenia, Bangladesh, Chile, Kyrgyzstan, Latvia, Lithuania, Romania, Slovenia, Sri Lanka, Uruguay
- > = 35 < 40 US-\$: Afghanistan, Australia, Brazil, Colombia, Croatia, the Czech Republic, Estonia, Hungary, India, Indonesia, Luxembourg, Macedonia, Mexico, Nepal, the Netherlands, New Zealand, Poland, Portugal, Slovakia, Ukraine, United Kingdom, USA, Venezuela
- > = 40 < 45 US-\$: Austria, Belgium, Bolivia, Bulgaria, Denmark, Ecuador, France, Germany, Ireland, Morocco, South Africa, Spain, Sweden, Tunisia
- > = 45 < 50 US-\$: Algeria, China, Ethiopia, Finland, Greece, Italy, Kazakhstan, Russia, Sudan, Syria, Turkmenistan, Vietnam
- > = 50 < 60 US-\$: Albania, Azerbaijan, Cameroon, Iceland, Iran, Israel, the Philippines, Switzerland, Thailand, Turkey, Uzbekistan
- > = 60 US-\$: Canada, Cyprus, Egypt, Japan, Jordan, South Korea, Malaysia, Norway, Saudi Arabia, Taiwan

Milk price trends in world regions from 1996-2010 in US-\$ (see Chapter 2.4)

General

Only about 65% of the countries reflected the world market trend by increasing farm gate prices, compared to over 85% of the countries which reflected the declining world market trend in 2009. Here it is important to recognise the different product mixes of countries e.g. EU with its cheeses, New Zealand with its whole milk powder. The world market trend shown in the IFCN milk price indicator is based on skim milk powder and butter, the latter being traded at a premium price compared to other dairy products in 2010.

EU-15

After the milk prices dropped in 2009, they rose again in 2010. Most EU-15 member states reflected the world market trend. The lowest milk price in 2010 was found in the United Kingdom (37.2 US-\$/100 kg ECM), the highest milk price at 49.6 US-\$/100 kg ECM, in Greece, closely followed by Finland (48.9 US-\$/100 kg ECM) and Italy (48.6 US-\$/100 kg ECM). The change of milk prices ranged from +28% in Ireland to -6% in Spain, with an average change of +8%.

Explanation of variables

Remarks: 2010 milk price estimated for some countries is based on trend and expert knowledge. ECM: Energy corrected milk, standardised to 3.3% protein and 4% fat (see Annex A.6 for details). In the text only countries shown in the Country Pages (Ch 3.10 to 3.99) are included. On the world maps additional countries are shown, if data was available.

EU-new member states and other European countries

Nearly all the countries showed an increase in prices from 2009 to 2010 with +4% in Bulgaria up to +33% in Lithuania, with the exception of Slovenia (-3%) and Cyprus (-4%). In 2010 Lithuania showed again the lowest price level (30.3 US-\$/100 kg ECM), followed by Romania (31.5 US-\$/100 kg ECM). Prices higher than the EU-15 average (42.2 US-\$/100 kg ECM) were observed in Cyprus, Turkey, Albania and closely followed by Bulgaria just below the EU-15 average (41.9 US-\$/100 kg ECM). All other countries were in a price range between 28.3 and 38.2 US-\$/100 kg ECM.

CIS countries: In 2010 these countries had a wide price range from 28 US-\$/100 kg ECM in Belarus to 58 US-\$/100 kg ECM in Uzbekistan. Uzbekistan, Kazakhstan and Russia were above the EU-15 average.

Middle East: The world milk price trend was partly reflected by increasing prices in Saudi Arabia (+4%), Syria (+4%) and Iran (+3%). The milk price in Israel was stable (+0.3%). Decreasing prices were observed in Jordan (-5%), where from the end of 2009 the local regulations allowed importation of reconstituted milk leading to a drop in the local milk price.

Other countries: With the exception of Kyrgyzstan (-16%), all these countries showed increasing or stable milk price developments. Increasing prices were observed in Azerbaijan (+4%), Afghanistan (+14%), Canada (+11%) and Norway (+9%). In Switzerland (-0.7%) and Iceland (+0.1%) milk prices were almost stable.

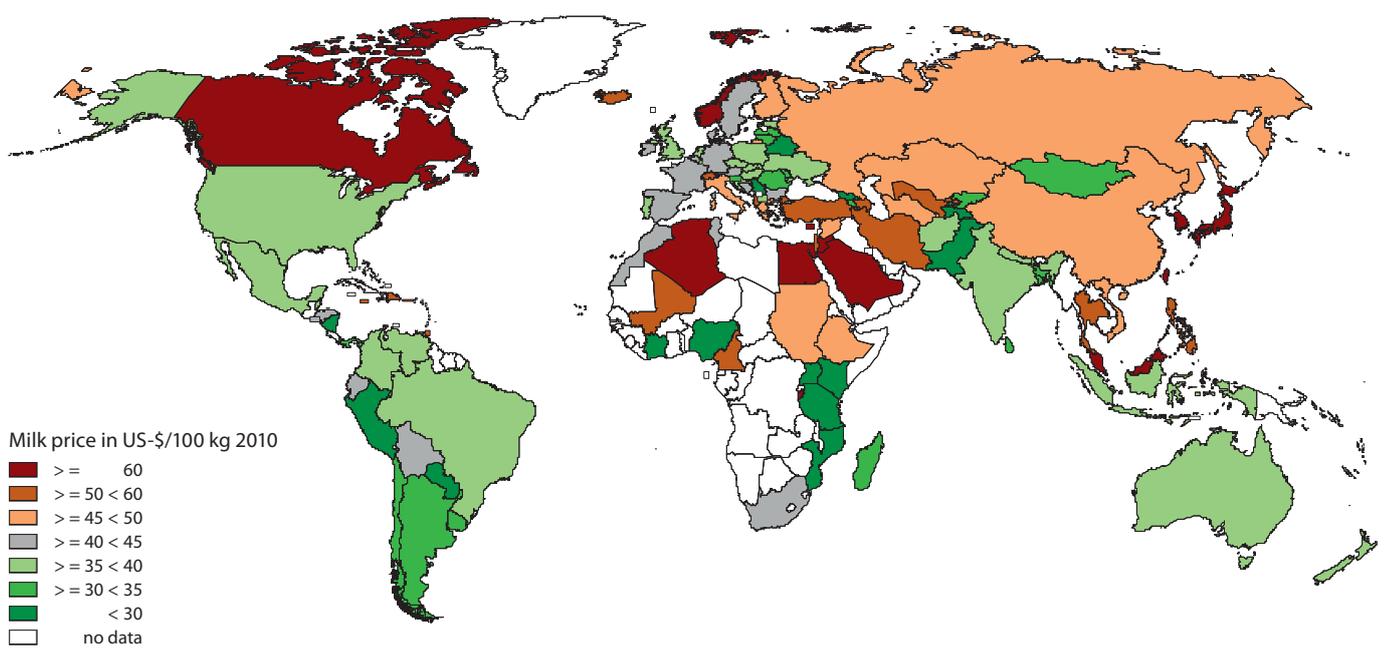
USA, Central and South America: With the exception of Paraguay (-14%) and Venezuela (-38%), all countries reflected the world market price trend to some degree in 2010. Strong increases of 30% or more were observed in Argentina, Bolivia and Uruguay.

Asia: The milk price increased in all Asian countries. Thus, the Asian milk price status can be categorised in 4 different price levels, but on a generally higher level compared to previous years: 30-40 US-\$/100 kg: India, Bangladesh, Nepal, Indonesia, Sri Lanka; >40-50 US-\$/100 kg ECM: China, Vietnam; >50-60 US-\$/100 kg ECM: Thailand, Malaysia and the Philippines. The highest milk prices were found in South Korea, Taiwan and Japan (66-102 US-\$/100 kg ECM). The lowest milk price was observed in Pakistan (29.8 US-\$/100 kg ECM).

Africa: There is a diverse picture of national milk price developments with one half decreasing and the other half increasing prices. In 2010 there was a farm gate milk price decrease in Cameroon (-5%), Tunisia (-11%), Ethiopia (-28%), Morocco (-4%) and Kenya (-9%). The farm gate prices increased in Uganda (+3%), South Africa (+14%), Algeria (+4%), Egypt (+9%) and Nigeria (+13%).

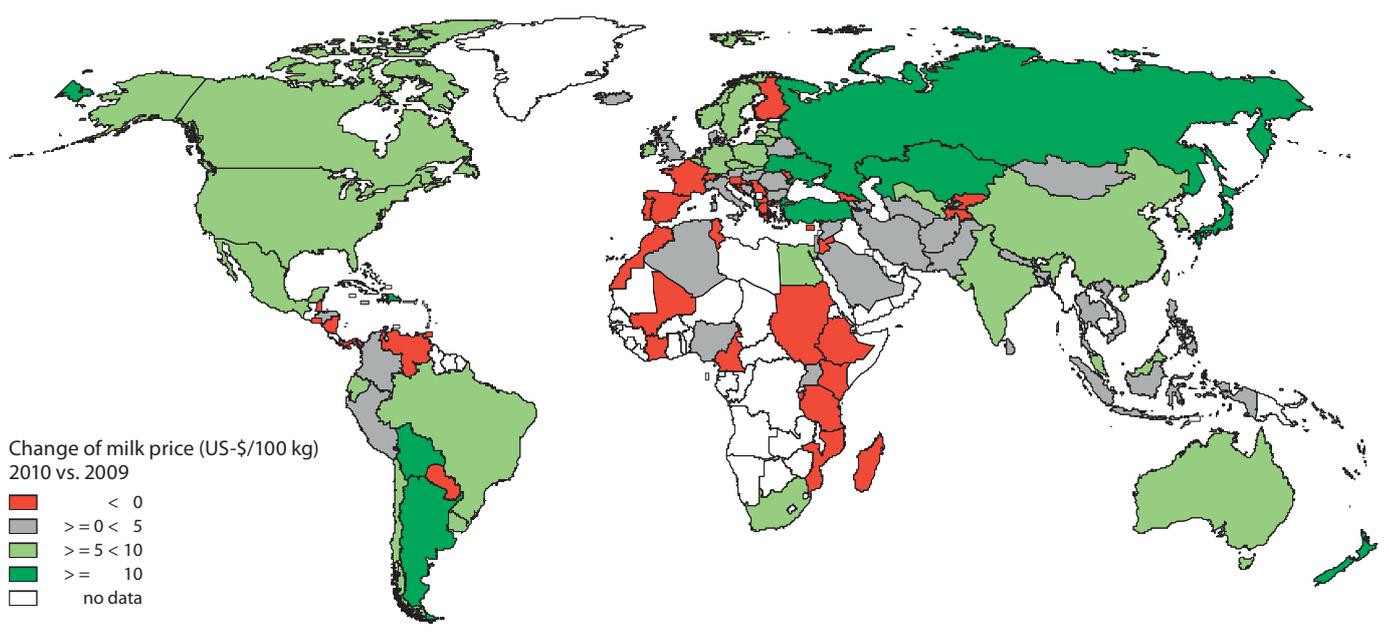
Oceania: In general, the milk prices in Australia and New Zealand follow the world market price closely. Prices increased strongly in 2010 by +40% in New Zealand and +34% in Australia, remaining below the world market level. This has to be seen in relation to the IFCN milk price indicator which is based on skim milk powder and butter. Butter was traded at a premium price in 2010 compared to other dairy commodities. At an average annual milk price of 37.4 US-\$/100 kg ECM, 2010 was a record payout year for New Zealand farmers. The 2010 increase followed a similarly strong decline from 2008 to 2009 down to almost the world market price level. This was a decline of -30% for the Australian milk price and of -18% for the New Zealand milk price.

Milk prices in US-\$ 2010



Source: National statistics/surveys, in some cases estimations.

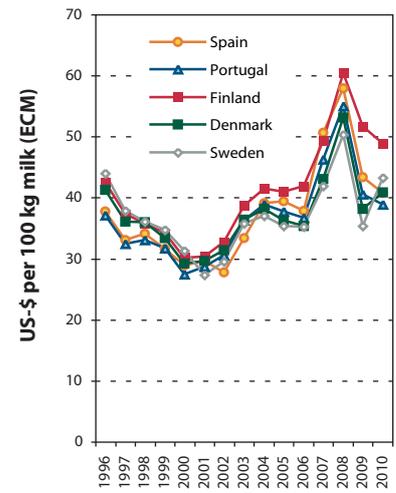
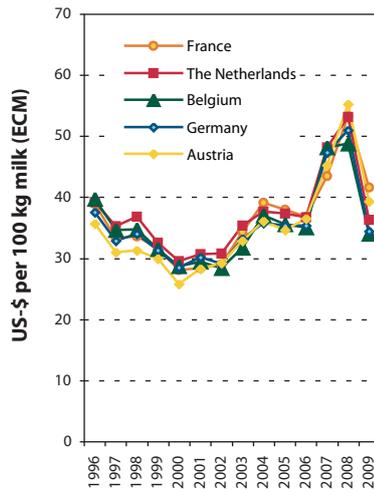
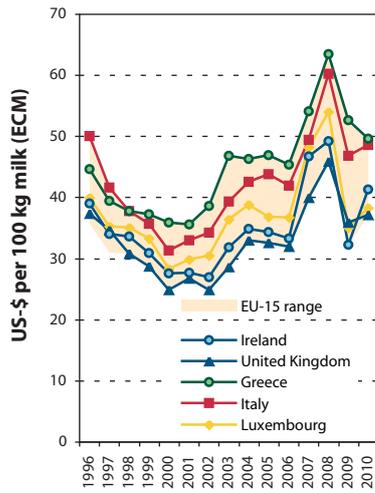
Change of milk price in US-\$ 2010 vs 2009



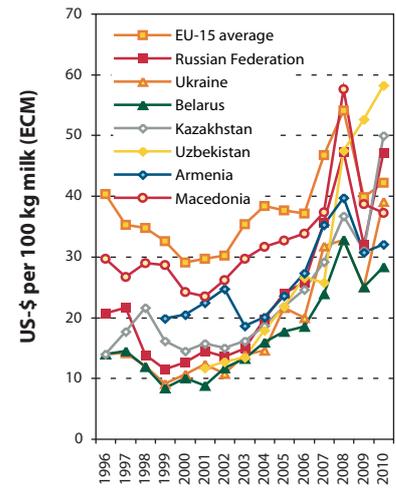
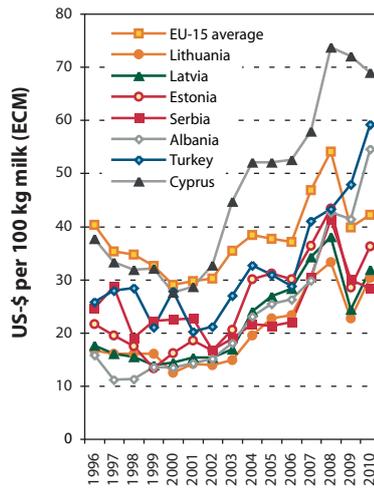
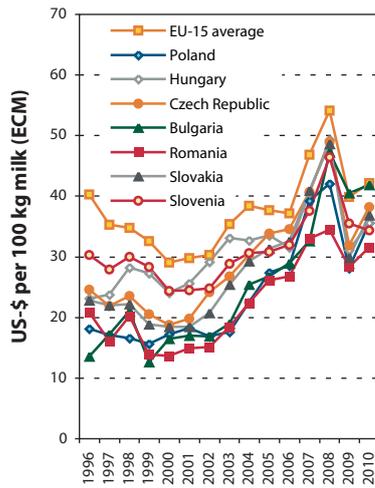
Source: National statistics/surveys, in some cases estimations.

2.4 Monitoring milk prices 1996-2010

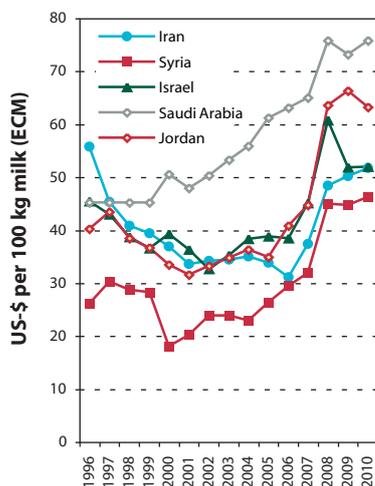
EU-15



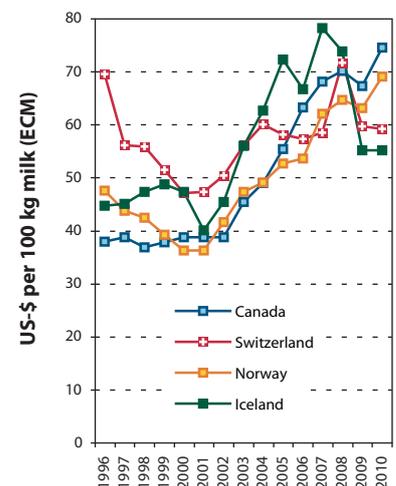
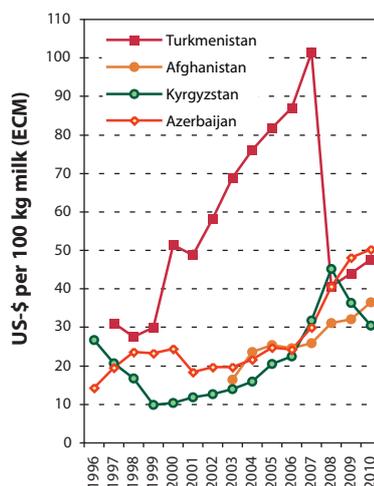
EU-new member states, Eastern Europe and CIS countries



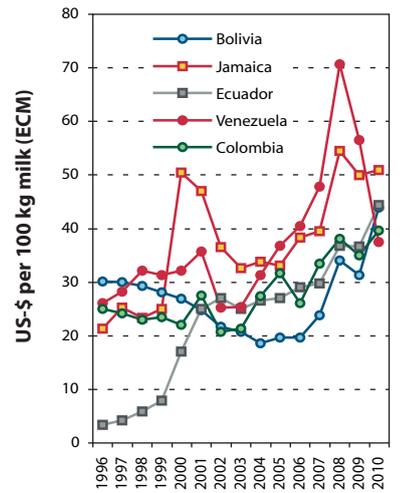
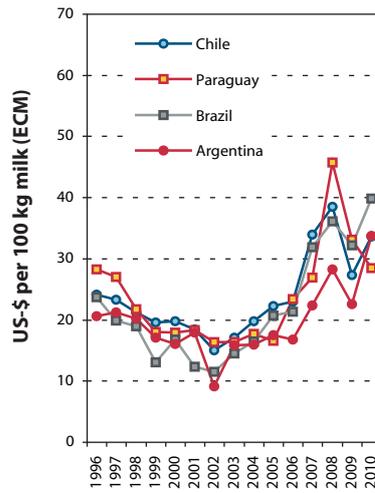
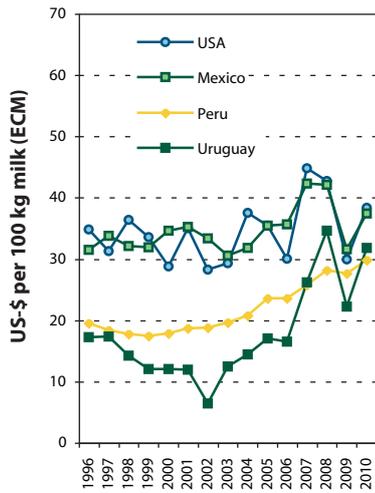
Middle East



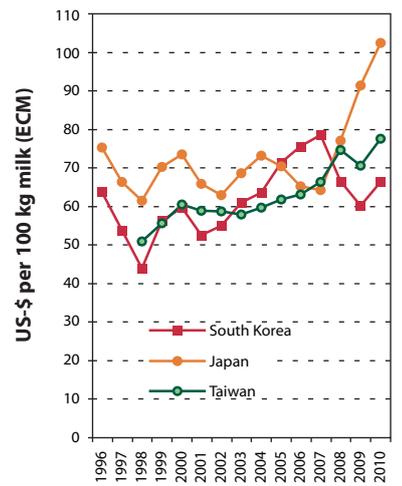
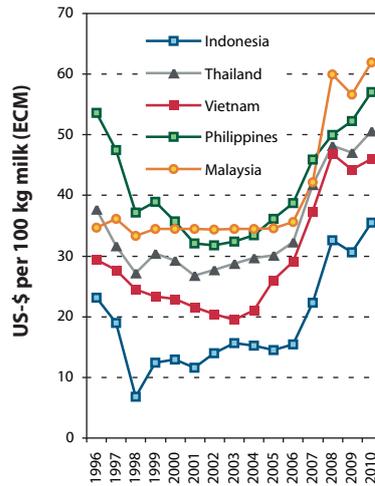
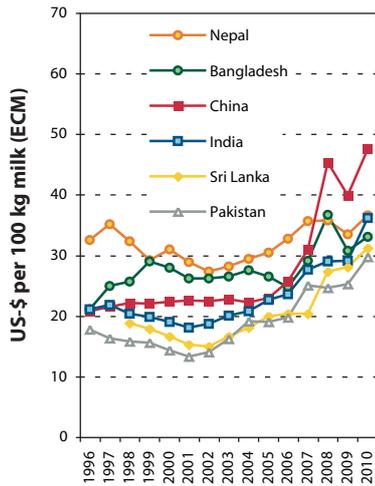
Other countries



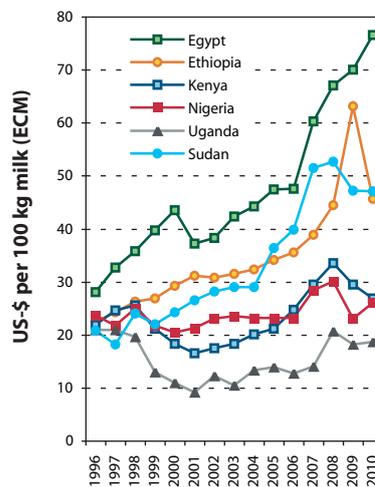
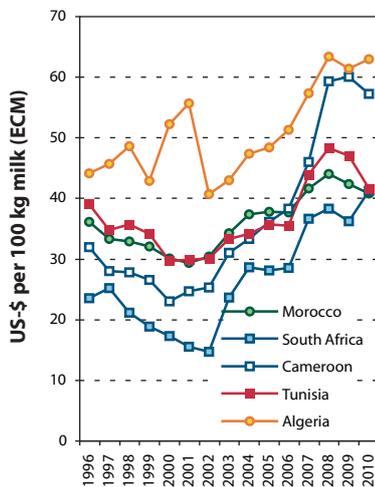
USA, Central & South America



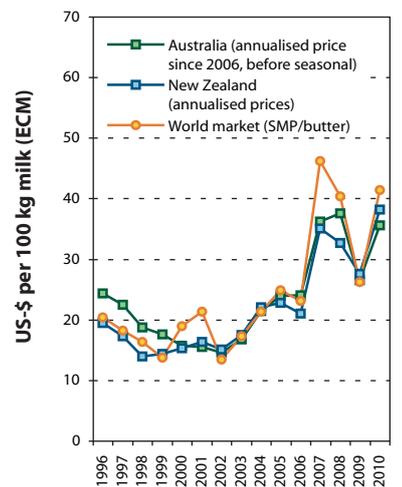
Asia



Africa

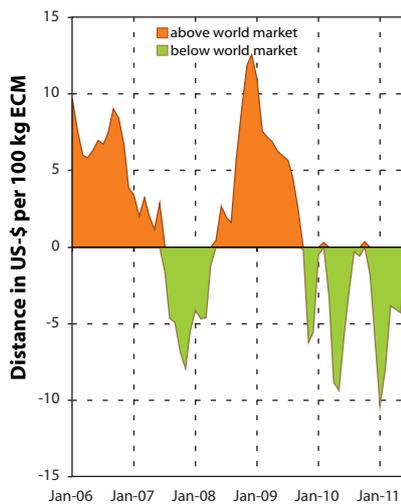
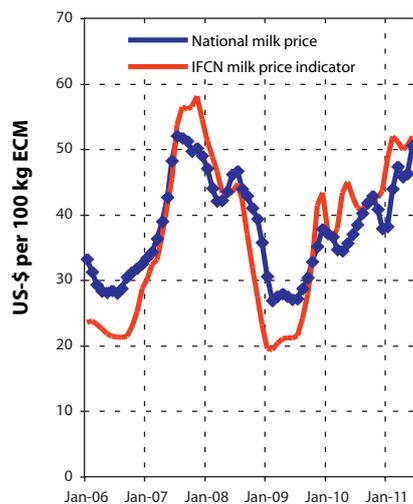


Oceania



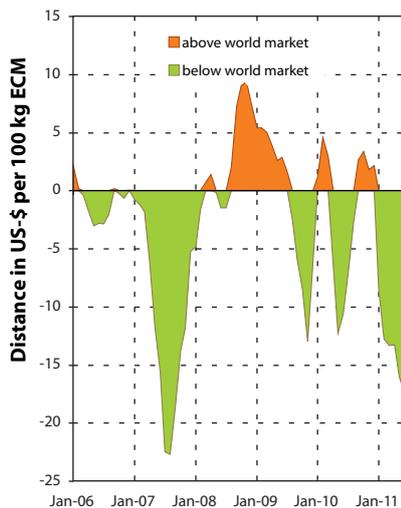
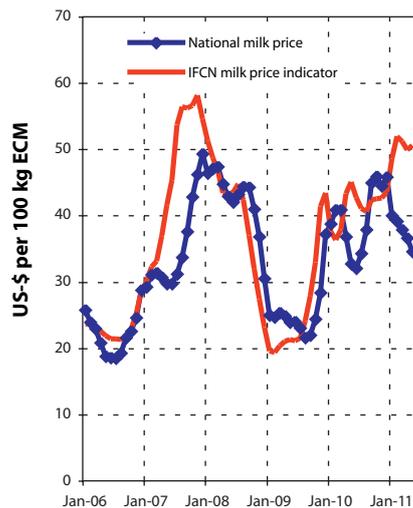
2.5 Monthly milk price transmission and key facts

USA



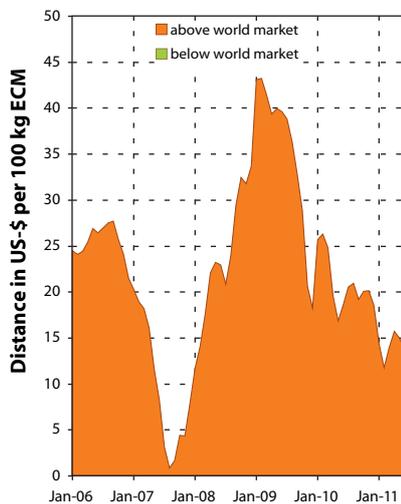
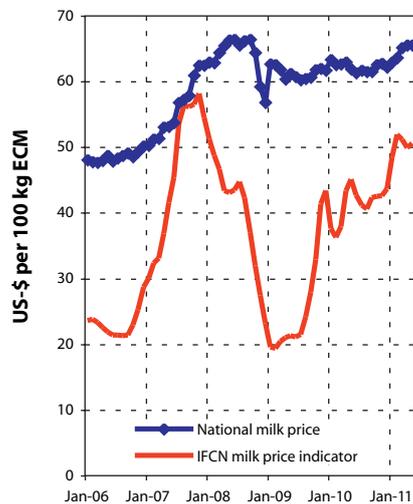
- High degree of interrelation between world and national price. The national price reacts with some time delay and does not quite follow the fluctuations of the world price.
- Market prices for cheese, butter, whey and skim milk powder determine minimum farm milk prices through government milk pricing formulas.
- Most milk is used for cheese making, and, through pricing formulas, cheese prices also affect the minimum price for liquid milk, the second biggest use.
- Exports absorb an increasing share of the USA milk supply. Approximately half of the SMP and whey products manufactured in the USA are exported. Cheese exports are growing rapidly while cheese imports are declining.

Ukraine



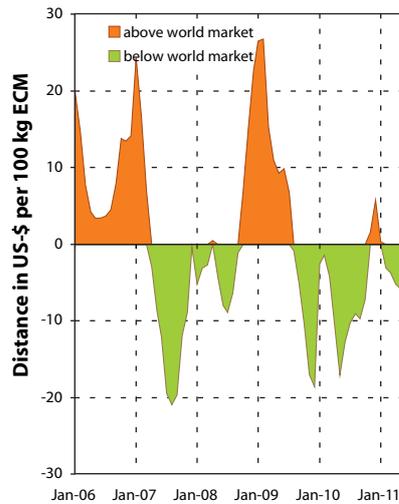
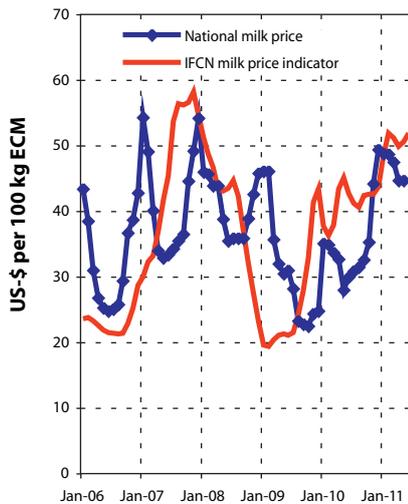
- The national milk price is on average 3.4 US-\$ below the world price, to which it is strongly connected. Some time-delay in the response of national prices can be observed (2007, End 2008, End 2009).
- State subsidies are given to dairy producers in the context of the new Tax Code.
- From January 2011, dairy producers will be paid state subsidies for the number of heads on the farm and not for the amount of milk delivered for processing.
- Due to the changes in the state subsidy mechanism, milk prices have fallen by 15 to 20% depending on the different milk processing companies.
- On January 2011 average milk prices were fixed at the following level: for the corporate sector 0.3 EUR/kg and for individual producers (small-holders) 0.2 EUR/kg.

Algeria



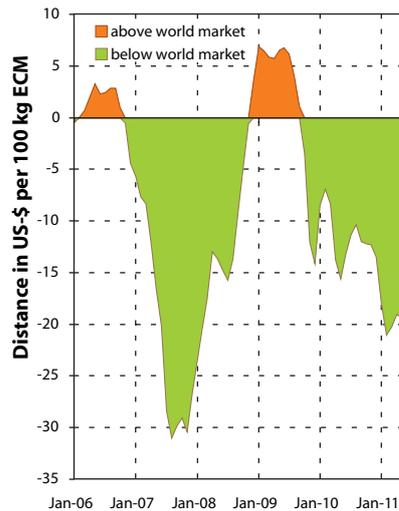
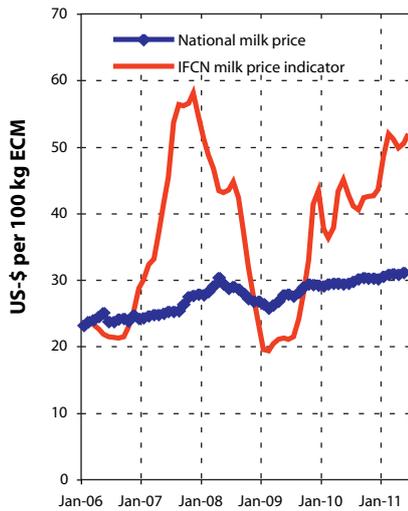
- The national milk price is always above the world market, on average 22.2 US-\$. This is mainly due to policy.
- The government gives a subsidy of 1,200 DZD/100 kg directly to the farmer (included in the milk price), 500 DZD for the collector and 400 DZD for the processor (if the processor uses <100% fresh milk for processing) or 600 DZD when 100% fresh milk is used (year 2010).
- Many processors give subsidies for feed to the farmer, 10 % of the cost price of feed is supported.

Armenia



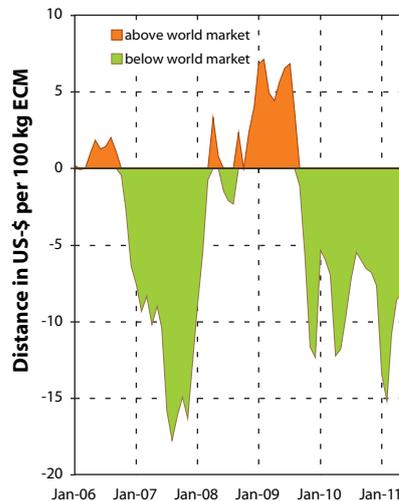
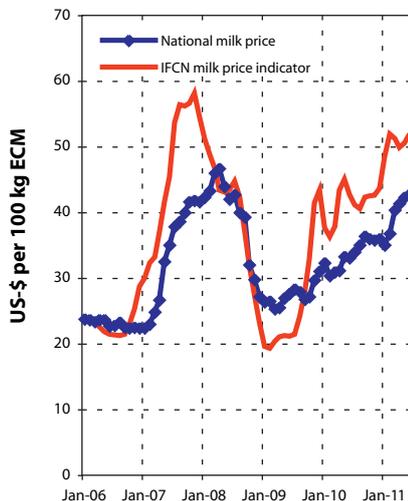
- A strong seasonal pattern can be observed in the national milk price, which is on average only 0.3 US-\$ above the world market price.
- During the last few years cheap milk powder has been imported putting pressure on national farm gate milk prices.
- Due to the fact that farmers received a low milk price during the last few years, they began reducing their stocks (2010 vs 2007 total cow number -12%).

Peru



- The national milk price is quite stable at a comparatively low level, on average 9.1 US-\$ below the world price, which creates an opportunity on the world market.
- High concentration of the market: Gloria SA with 40% and Nestlé 10% of milk production.
- Higher milk production costs because of higher grain costs (corn and soybean). Peru is about 50% dependent on grain imports. Milk production has not been affected so far because of high demand.
- Demand is mostly driven by the economic growth (GDP +8.8% in 2010, source IMF). The degree of self-sufficiency was 93% in 2010.
- The government has decreased the import tariff, especially with the USA where it is zero-tariff. About 9% of milk production is exported (2010).

Chile



- The national milk price is connected to the world market price, although on average remaining 4.5 US-\$ below it and not quite following the fluctuations.
- The exchange rate of the national currency (CLP) is strong against the US-Dollar, resulting in exports being less competitive on the world market and putting pressure on national milk prices.
- On the other hand, oil, fertilizer and feed prices are increasing and, therefore the production costs forcing the milk price up. Milk processors have free processing capacity via new facilities, which results in an increased demand for raw milk. Also, as the national income increased, internal demand for milk products grew too. Climatic risks, like the El Niño or La Niña phenomenon, are uncertainty factors.

2.6 Monitoring feed prices 1996-2010

General remarks

In two thirds of the countries the feed price increased in 2010 after a decrease in over 90% of the countries in 2009. Feed is the main driver for production costs on farms. The aim of this chapter is to compare the feed price situation in 2010 in 90 countries and to illustrate price trends of selected countries.

Method

The comparison of concentrate feed prices is extremely difficult as it is impossible to compare the contents (e.g. energy, protein). The analysis therefore is based on comparable feed which in this case is soybean meal and corn or barley. The calculation equals that of the IFCN feed price indicator (0.3 kg soybean meal price + 0.7 kg corn or barley price). Advantages: This indicator gives a preliminary idea of regions with high/low feed prices and trends. Limitations: In a number of countries dairy compound feed is based on other commodities. In this case feed prices are probably overestimated.

Data

The data is based on national statistics. In selected countries the prices are based on IFCN estimates (national versus world market price trends in the past). In countries where no national data was available the world market price was used. Need for validation: The uncertainties in the data collection require an ongoing validation and improvement procedure. Therefore feedback and comments to the IFCN are very welcome.

Feed prices in 2010 on US-\$

In 2010 the world market price of feed, based on corn and soybean meal, was 23.0 US-\$/100 kg, which represents an increase of 2.6% compared to 2009. The price ranged between 11.8 US-\$/100 kg and 60.8 US-\$/100 kg in all the countries which can be grouped into five categories:

- < 20: Argentina, Azerbaijan, Cyprus, Estonia, Pakistan, Paraguay, Russia, Turkmenistan, Ukraine, Turkmenistan
- > = 20 < 30: Afghanistan, Algeria, Australia, Austria, Belarus, Brazil, Bulgaria, Canada, Chile, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, India, Indonesia, Italy, Jamaica, Kazakhstan, Kenya, South Korea, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Macedonia, Malaysia, Nepal, the Netherlands, New Zealand, Poland, Romania, Saudi Arabia, Serbia, Slovakia, Slovenia, South Africa, Spain, Tunisia, United Kingdom, USA, Uruguay, Uzbekistan
- > = 30 < 40: Armenia, Bangladesh, Belgium, Bolivia, China, Colombia, Egypt, Ethiopia, Iran, Ireland, Israel, Jordan, Mexico, Morocco, the Philippines, Portugal, Sudan, Sweden, Syria, Taiwan, Thailand, Turkey, Uganda, Vietnam
- > = 40 < 50: Albania, Ecuador, Nigeria, Peru, Sri Lanka, Switzerland
- > = 50: Cameroon, Iceland, Japan, Norway

Explanation of variables

IFCN feed price indicator (World market): Calculation: 0.3 kg soybean meal price + 0.7 kg corn price. The annual price is calculated as the arithmetic mean from monthly data.

Data source: International Monetary Fund. Specification: Soybean meal: CME futures first contract forward, Corn: FOB US Gulf.

National feed prices: National statistics. Based on the soybean meal price in combination with barley or corn price, country specific.

Calculation: 0.3 kg soybean meal price + 0.7 kg corn or barley price.

Exchange rates: Oanda.

Note: The IFCN feed price indicator is an indicator for the cost of compound feed. It does not reflect the degree to which local farmers, e.g. in extensive feeding systems, are affected.

Feed price developments 1996-2010 in US-\$

The world market price of feed in 2010 was 23.0 US-\$/100 kg, +2.6% higher than the 22.4 US-\$/100 kg price in 2009.

Germany: The German feed price generally reflects the world market trend on a higher level but in 2010 it declined by 13.5% and for the first time even fell below the world market level by 0.5 US-\$/100 kg feed (22.5 US-\$/100 kg).

Poland: The feed price was always above the world price level, although it came very close to it in 2009 (23.3 US-\$/100 kg) and 2010 (23.2 US-\$/100 kg).

Ukraine: With the exception of 2007 the national feed price remains on average about 20% below the world market price level (2007: +13%). In 2010 the price rose 12.4% to 18.9 US-\$/100 kg.

USA: US feed prices are on average 10% below the world market price level, which was also the case in 2010 when the price was 21.4 US-\$/100 kg. This was an increase of 3.4% compared to 2009.

Argentina: The Argentinean feed price is lower than the world market price of feed, on average 20% lower (1996-2010). During 1996-2004 the average distance to the world market price was -14%. In the five year period from 2005 to 2010 this distance increased on average to -28%.

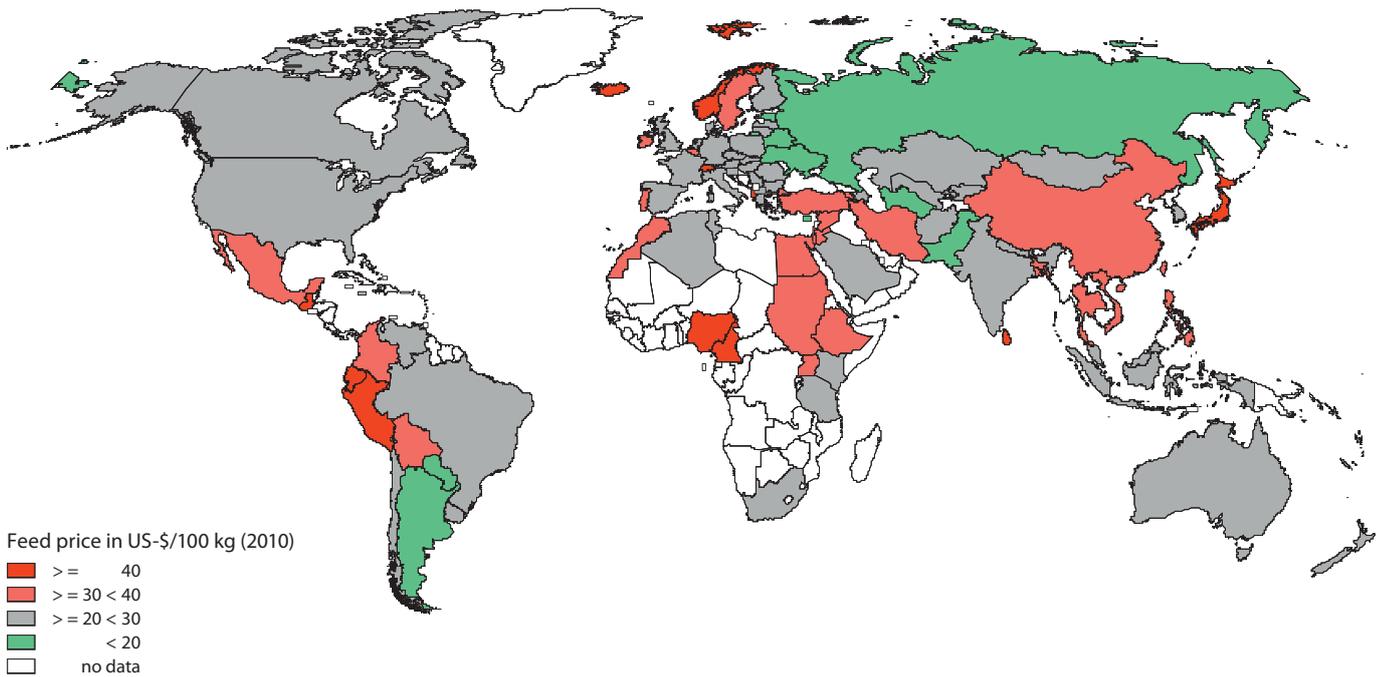
Brazil: In 2010 the price was 24.9 US-\$/100 kg, an increase of 1.8%. It generally follows the trend of the world price on a 7% higher level.

New Zealand: The price follows the world market trend, but remained on average 23% above the world market in the period 1996-2010. In 2009 the price was 38% above the world market price, declining by 9.1% in 2010 to 28.1 US-\$/100 kg. If the New Zealand dairy farms were to use concentrates, most of them would buy imported feed. The importation costs would then result in the local price being above the world market prices.

China: The Chinese feed price is roughly connected to the world market price, lying on average 42% above it (range: 16-64%). Especially in the years 2009/2010, national feed price developments deviated from the world market trends. In 2009 the price marginally declined in national currency terms and was stable in US-\$ terms at 34.1 US-\$/100 kg, increasing in 2010 by 7.8% to 36.7 US-\$/100 kg. Since 2006 the Chinese feed price has increased by 70%.

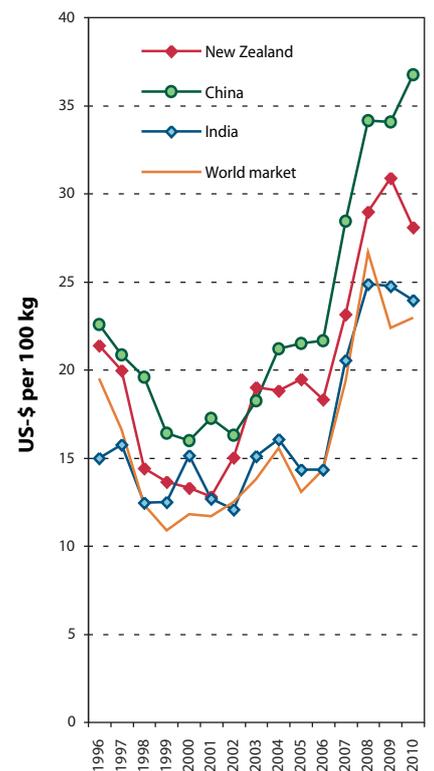
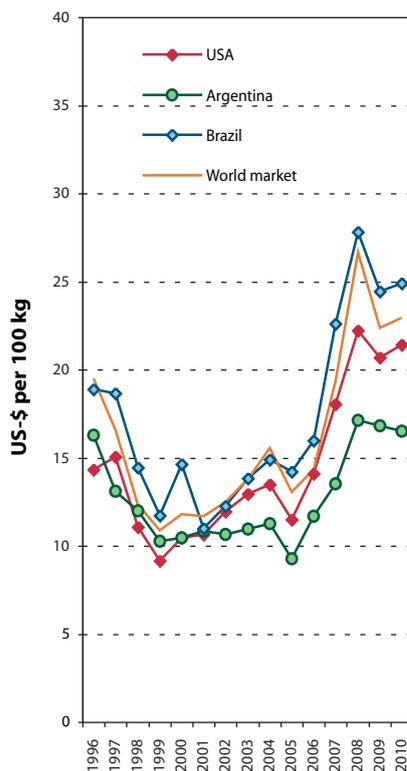
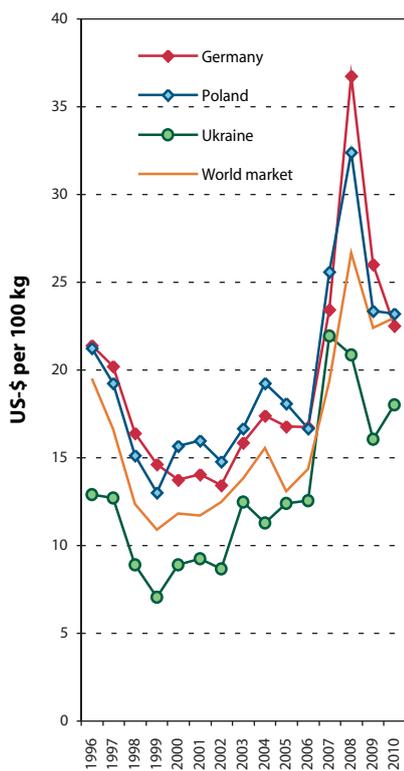
India: In 2010 the feed price was 24.0 US-\$/100 kg, a decline of 3.2% from 2009. The Indian feed price is on average very close to the world market level (+4%), but the distance varied from -23% to +28% over the years 1996-2010. The national price remained above the world level in: 1998-2001, 2003-2005, 2007, 2010. An internal price below the world market price level was found in: 1996-1997, 2002, 2006 and 2008.

Feed prices in US-\$ per 100 kg 2010



Source: National statistics/surveys, in some cases estimations.

Feed price developments 1996-2010 in selected countries



2.7 Monitoring milk : feed price ratio 1996-2010

Introduction

This chapter shows the milk : feed price ratio, which is an indicator for the price developments of milk as the main output and feed as the most important input. The aims of this chapter are to compare the milk : feed price ratio world-wide and to illustrate the milk : feed price ratio trends in selected countries.

Milk : feed price ratio – A definition

The milk : feed price ratio is defined as milk price divided by the price of purchased feed. In a simplified form it shows how much feed (kg concentrates) a farmer can buy after selling one kg of milk.

The milk : feed price ratio has been defined as favourable if it is higher than 1.5. If this is the case, high yield (high input) systems can be used or the higher the ratio is, the more economical it is to use concentrates. In extensive feeding systems, it represents a theoretical figure which indicates how advantageous the input of compound feed would be, if it were used.

Milk : feed price ratio – A world-wide comparison

There have been some shifts in the milk : feed price ratios of some countries from 2009 to 2010, mostly depending on whether increasing milk prices could overcompensate the upward trend in feed prices. In 2010, there were more countries with a »favourable« ratio of >2, whereas the »unfavourable« section 1 to 1.5 decreased in comparison to 2009.

High milk : feed price ratios >2.0

The milk : feed price ratio was very favourable in: Argentina, Azerbaijan, Canada, Cyprus, Egypt, Estonia, Jamaica, Kazakhstan, South Korea, Malaysia, Pakistan, Russia, Saudi Arabia, Taiwan, Turkmenistan, Ukraine, Uzbekistan

Moderate milk : feed price ratio 1.5 to 2.0

Algeria, Australia, Austria, Brazil, the Czech Republic, Denmark, Finland, Germany, Greece, India, Israel, Italy, Japan, Jordan, Macedonia, Nepal, Paraguay, the Philippines, Poland, Slovakia, South Africa, Spain, Syria, Thailand, Tunisia, Turkey, United Kingdom, USA, Venezuela

Low milk : feed price ratio <1.5

The milk : feed price ratio was between 1-1.5 in many countries: Afghanistan, Albania, Bangladesh, Belarus, Belgium, Bolivia, Bulgaria, Cameroon, Chile, China, Colombia, Ecuador, Ethiopia, France, Hungary, Indonesia, Iran, Ireland, Kenya, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Mexico, Morocco, the Netherlands, New Zealand, Norway, Portugal, Romania, Slovenia, Sudan, Sweden, Switzerland, Uruguay, Vietnam

A very unfavourable milk : feed price ratio (<1) was found in: Armenia, Iceland, Nigeria, Peru, Serbia, Sri Lanka, Uganda

Milk : feed price ratio trends in 1996-2010

World market: The world milk : feed price ratio (1.8) increased by 54% in 2010, after a 23% drop the year before.

Germany: After a slight drop to 1.33 (-4%) from 2008 to 2009, the ratio increased to 1.83 in 2010 (+38%). From 1998 to 2007, the ratio was stable at a favourable level of 2.0-2.2.

Poland: The Polish milk : feed price ratio is mostly close to or below the world market level. After being on average 41% below the German level from 1996 to 2007, the average distance was only -10% in 2008 to 2010.

Ukraine: The ratio ranged between 1.1 and 1.3 until 2004. From 2005 to 2009 the ratio was on average at a favourable level of 1.58. In 2010 it increased by 39% to 2.17.

USA: In 2010 the ratio increased to 1.79 (+24%), after being for the first time under the 1.5 level in 2009 (1.45). The US milk : feed price ratio is characterised by a strongly volatile development on a high level. Since 2006 it seems to be more closely connected to the world market developments.

Argentina: Except for the year of the Argentine crisis, the ratio ranged between 1.3 and 1.9 (1996-2009). In 2010 the ratio was for the first time at 2.0.

Brazil: Following the world market trend, the ratio increased in 2010 by 22% to 1.6. This is the first year on a favourable level of >1.5.

New Zealand: The ratio, during the observed timeline, was on average at 1.1. This is one of the reasons for the pastoral systems typical of New Zealand.

China: On average the Chinese ratio is marginally better than that of New Zealand (1.2 versus 1.1).

India: The Indian milk : feed price ratio fluctuates around the 1.5 level, usually remaining below it. In 2010 it was 1.51.

Conclusions: Many countries reflected the trend of the world market developments by increasing milk : feed price ratios. Intensive feeding systems became increasingly favourable, after an unfavourable development in 2009. With feed being the major cost component in milk production, and with a high degree of volatility on the markets, the farmers' ability to quickly adapt to changing circumstances will be a key driver for future success.



Explanation of variables

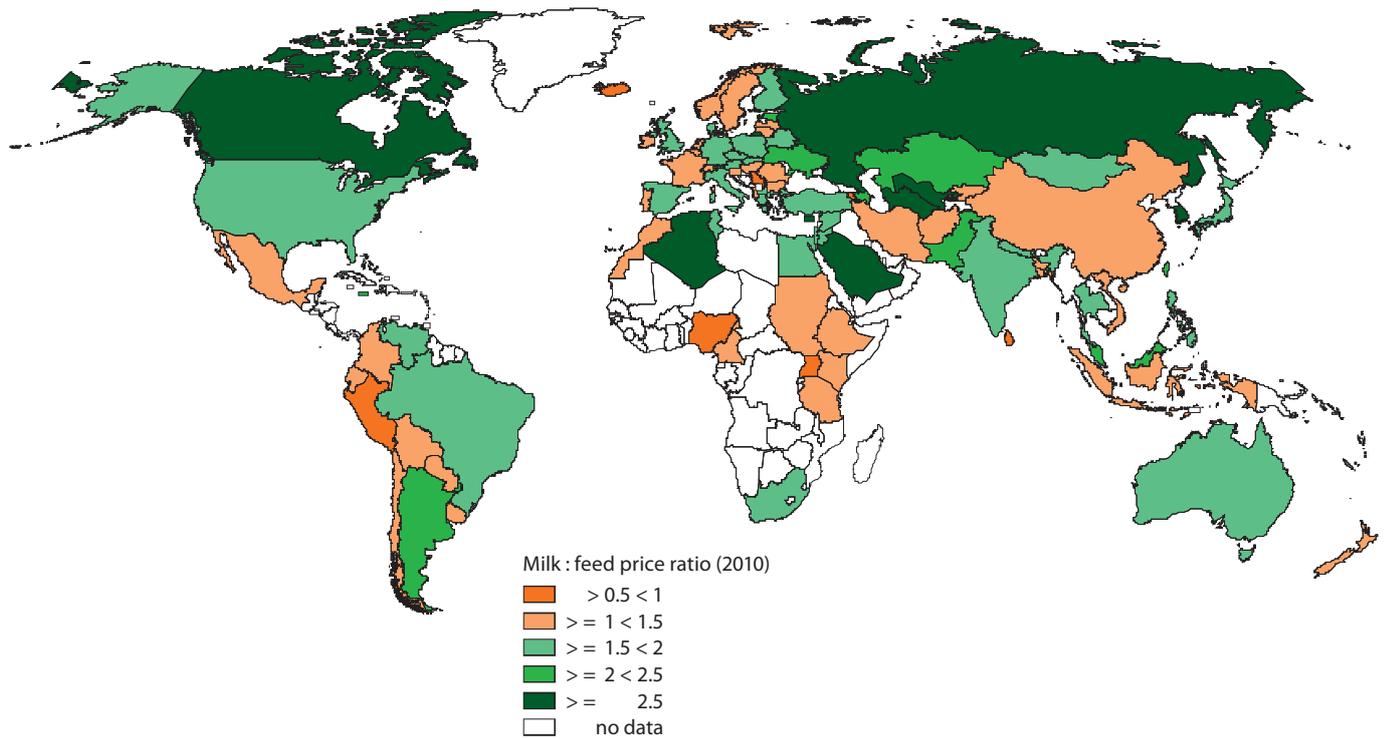
Milk : feed price ratio: Milk price divided by the calculated feed price.

National milk : feed price ratio: Data source: Milk and feed prices from national statistics. Feed: Based on the soybean meal price in combination with barley or corn price, country specific. Calculation: 0.3 kg soybean meal price + 0.7 kg corn or barley price.

World market: Calculation: IFCN milk price indicator divided by IFCN feed price indicator. **IFCN feed price indicator:** Data source: International Monetary Fund. Specification: Soybean meal: CME futures first contract forward, Corn: FOB US Gulf. Calculation: 0.3 kg soybean meal price + 0.7 kg corn price. The annual price is calculated as the arithmetic mean from monthly data.

IFCN milk price indicator: Source: USDA. Specification: Oceania prices: SMP (1.25% fat), Butter (82% fat). Calculation: ((butter price - processing costs)/technical coefficient for butter + (SMP price - processing costs)/technical coefficient for SMP). The annual price is calculated as the arithmetic mean from monthly data.

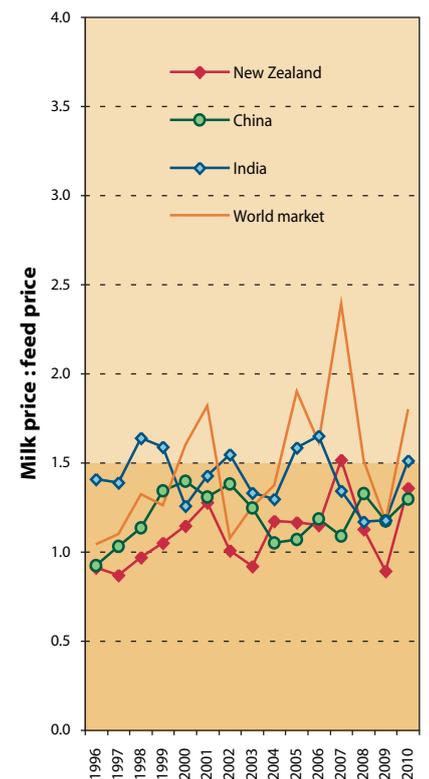
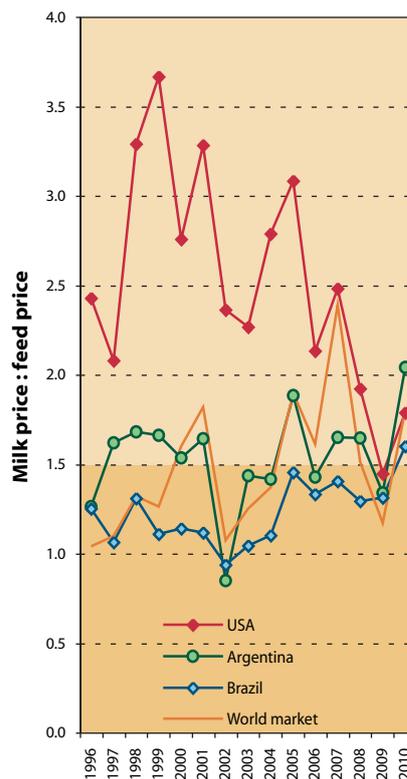
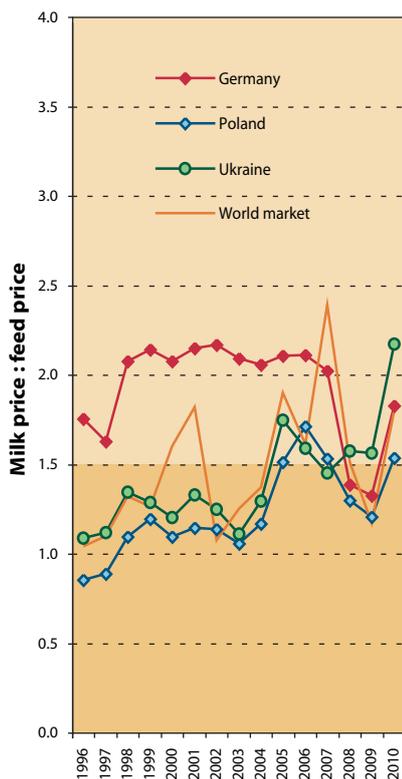
Milk feed price ratio 2010

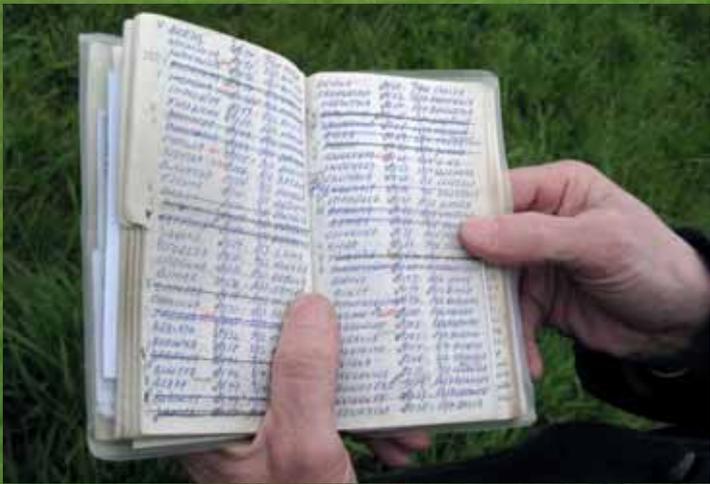
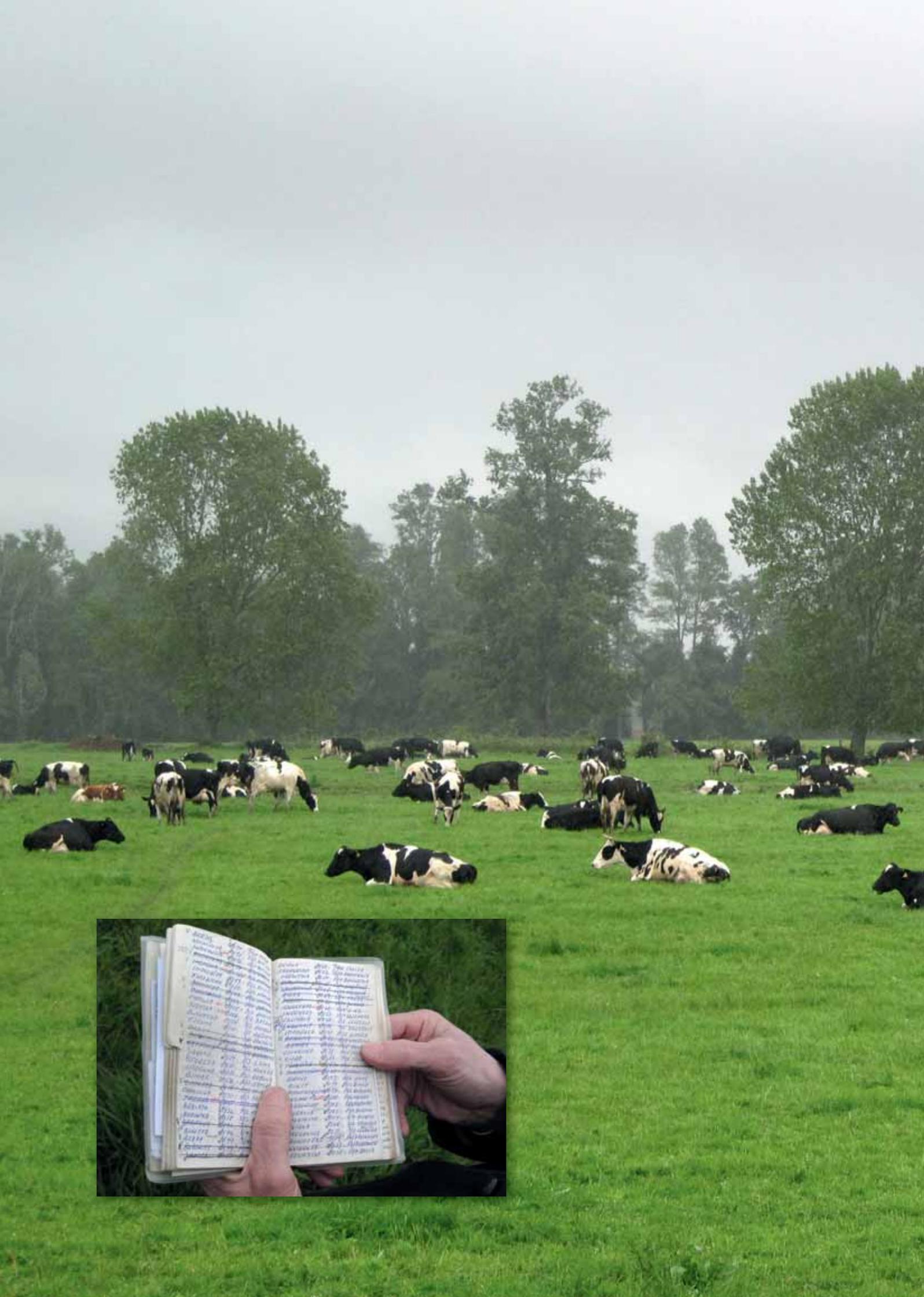


Comment: IFCN calculation, see text Chapter 2.7

Source: National statistics/surveys, in some cases based on estimations.

Milk : feed price ratio developments 1996-2010 in selected countries











Previous double page: Milk production in Chile - pictures by T. Hemme
 This double page: Milk production in New Zealand - pictures by T. Hemme

Chapter 3

Authors: Karin Wesseling, Eva Schröder-Merker, Mikhail Ramanovich, Mohammad Mohi Uddin with the contribution from researchers mentioned on page 2-3 of this report

Status and development of milk production

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3.1 Summary – status and development of milk production

Introduction

This chapter summarises the key findings of the maps shown in Chapters 3.2-3.9. Milk production figures are the focus of the Country Page Analysis this year. A significant improvement in data quality, volume of data per country and number of countries analysed has been achieved. It is now possible to show world maps with a regional breakdown for 13 important dairy countries including variables such as the development in milk per farm.

Milk production volumes 2010 in million t (see Chapter 3.2)

Data: Country milk production data is standardised to energy corrected milk (ECM, 4% fat and 3.3% protein), while regional data is stated in natural fat and protein content. Regional data is available for 8 countries (of 49 on the Europe map) up to 2009 and one up to 2008. If we consider whole-country data for these nine countries, we might underestimate the European milk production on a regional level in 2010 by 1.2 to 1.4 mill t, or 0.6%.

Milk production world-wide: The IFCN estimates world milk production of cow and buffalo milk at 697 mill t ECM in 2010 (+1.9% versus 2009). The volume map shows very clearly that Europe and South Asia are still the most important dairy regions in the world representing 46.1%. The regions with largest milk production are: IN-Uttar Pradesh (20.1 mill t), US-California (18.3 mill t) and US-Wisconsin (11.8 mill t). In comparison to this, New Zealand has a production of 19.2 mill t ECM and Poland 11.9 mill t ECM.

Milk production in Europe: It reached 215 mill t in 2010, of which the EU-27 countries produced 70%. The most prominent areas (see milk volume map for Europe) are the North Sea coastal areas of France (Nord-pas de Calais), Belgium, The Netherlands, Germany and Denmark with a total of 30.2 mill t and the north-west of France (Brittany, Lower Normandy, Pays-de-la-Loire) with a total of 10.8 mill t milk production. The three largest single milk producing regions are: FR-Bretagne (4.8 mill t), IT-Lombardy (4.4 mill t) and FR-Pays de la Loire (3.5 mill t). In comparison to this, Romania produces 4.6 mill t ECM, Ireland and Denmark produce 5.3 and 5.2 mill t ECM, respectively.

Centres of milk production 2010 (see Chapter 3.3)

Method: Milk production divided by square kilometre total land.

Milk density world-wide: A high milk density over 20 t milk per km² (or 2,000 t milk per hectare) total land, can be found in parts of the USA (California and Idaho in the west and around the Great Lakes in the east), several regions of Mexico, Santa Catarina in Brazil, Santa Fe in Argentina, and Region X in Chile. Also many European countries, Israel, South Korea, Japan and New Zealand have a high milk density. Furthermore, centres of milk production can be found all over India, parts of Pakistan and Bangladesh, regions of Turkey and Russia, the Victoria region in Australia, and the outskirts of Beijing and Shanghai.

Milk density in Europe: The scale has been adjusted and regions with more than 100 t milk per km² (or 10,000 t per hectare) total land can be seen. The main centres are the coastline of France, Belgium, the Netherlands, Germany and Denmark and the western parts of the UK and Ireland, southern Germany, Switzerland and northern Italy. Also Podlaskie in eastern Poland and the Azores (Portugal) have a high milk density.

Conclusions: A high milk density can be found in the traditional grassland regions of the coasts or mountains, especially in Europe. This can imply benefits of concentration, such as lower costs (e.g. milk collection) but it can also signify disadvantages such as competition for land (e.g. soy bean production in Argentina or biogas in Germany). Low milk density in favourable areas may indicate space for growth but possibly higher costs (lack of concentration).

Percentage change in milk production 2006-2010 (see Chapter 3.4)

Annual change in milk production world-wide: The world's cow and buffalo milk production increased on average by 1.6 % per year in the time period 2006-2010, with significant variations between countries and dairy regions. Annual growth rates higher than 10% were found for Indonesia, Malaysia, some regions in China, Turkey, Russia, Brazil and Argentina. A number of regions increased milk volumes by more than 5% per year. World regions with a significant decline greater than -10% were: the south-eastern part of the USA, parts of Turkey, the Xinjiang region in west China and parts of South Africa.

Annual change in milk production in Europe: Regions which are growing strongly can be found in eastern parts of Spain, regions in Belgium and in the South East of Bulgaria. Two regions in Portugal show surprisingly strong growth in official statistics.

This indicates that strong upcoming dairy regions can increase milk production at a rate of 5% or more per year while weak regions decline at the same rate, unless hindered by political instruments. Milk production seems to move to areas which are less favourable for crop farming, making competition for land a possible key driver. Although no conclusions can be drawn yet further observation is required.

Volume change of milk production 2006-2010 (see Chapter 3.5)

Annual growth in production volume world-wide: The world's milk production increased on average by 10.4 million t ECM per year, a total of 41.6 mill tons in the 2006-2010 time period. The strongest annual production growth (53% of global values) was observed in India, Brazil and Pakistan. USA, China and Iran together provided 25% of the growth. In addition to these countries, Uzbekistan, Turkey, New Zealand, Russia, Germany, Belarus, Mexico, Ethiopia, Morocco and Bangladesh showed significant milk volume growth (over 0.1 mill t per year each) and provided 20% of the additional milk in 2006-2010. The strongest annual regional growth was found in India in Andhra Pradesh (0.8 mill t), Uttar Pradesh (0.7 mill t) and Gujarat (0.4 mill t) as well as in China in Henan Sheng (0.5 mill t). The largest decreases were observed in Ukraine (-0.5 mill t per year), Australia (-0.2 mill t per year), Egypt and Japan (-0.1 mill t per year each).

Annual growth in milk production volume in Europe: The annual production growth was +0.2 mill t, in which declining regions (-2.3 mill t) almost compensated growing regions (+2.6 mill t). Strong annual growth was observed in the North Sea coastal region (0.7 mill t), Eastern Poland and Belarus (0.4 mill t), some regions in Russia (Orenburg and Tatarstan 0.1 mill t, 15 regions between Ukraine and the Black Sea 0.2 mill t) and in the southern part of Turkey (14 regions 0.2 mill t).

Milk surplus and deficit in 2010 (see Chapter 3.6)

Method: On **country level**, milk surplus and deficit is calculated as exports minus imports plus stock changes. The surplus and deficit of milk on **regional level** was calculated for 13 countries shown on the world map and many countries shown on the European map. The calculation is based on the regional milk production data minus regional consumption. The latter is based on the average per capita milk consumption 2010 calculated by the IFCN, multiplied by the population in the region. For regional population, national statistics were used and, in some cases, extrapolations based on national population development. For India, the estimated surplus of milk delivered is shown. This was calculated via adjusted regional milk consumption as follows. Regional milk consumption = regional non-delivered milk + milk delivered per capita in the country * regional population. In the case of strong increases of dairy stocks, the sum of the regional surplus and deficit reflects the national surplus in milk and not the net exports in milk equivalents. Since sur-

plus and deficit on country level are calculated from standardised milk equivalents and regional ones from milk in natural contents, the sum of regions might differ from the value calculated on country-level. Due to great deviations, regional consumption in the USA was adjusted to non-standardised milk to correspond with regional production (natural contents).

Milk surplus and deficit world-wide: The top 10 surplus regions and countries are: 1. New Zealand (17.8 mill t), 2. US-Wisconsin (10.3 mill t), 3. CN-Inner Mongolia (8.6 mill t), 4. US-California (8.2 mill t), 5. Germany (7.5 mill t). France, US-Idaho, BR-Minas Gerais, AU-Victoria and CN-Heilongjiang with between 6.1 and 4.2 mill t surplus each, follow in places 6 to 10. If EU-27 was considered as an aggregate, it would claim second place in this ranking (12.8 mill t). The highest deficits can be found in Italy (-6.6 mill t), BR-São Paulo region (-5.1 mill t), United Kingdom (-4.2 mill t), US-Florida (-4.1 mill t) and RU-Moscow (-3.7 mill t, sum of Moscow city and region). However, also US-Texas, Spain, US-Illinois, CN-Guangdong Sheng and US-New Jersey have high deficits of 2.8 to 2.3 mill t each.

Milk surplus and deficit in Europe: The surplus regions are, in most cases, also those with high milk production density (see Chapter 3.3). There are a number of strong milk surplus regions in France (Bretagne 3.8 mill t, Pays de la Loire 2.4 mill t, Basse-Normandie 2.1 mill t), Denmark (2.3 mill t), Germany (Schleswig-Holstein 2.2 mill t, Weser-Ems 2.2 mill t, Friesland 1.7 mill t), the United Kingdom (South West 1.8 mill t), Spain (Galicia 1.8 mill t) and Poland (Podlaskie 1.7 mill t) which provide the milk for those with a deficit, usually larger cities or highly populated areas.

Accordingly, the highest deficits can be found in Moscow (-3.7 mill t, sum of Moscow city and region), Paris (Île de France -3.6 mill t) and London (-2.2 mill t). Furthermore, the regions UK-South East, Istanbul, IT-Campania, UK-East of England, FR-Provence-Alpes-Côte d'Azur, GR-Attica (Athens) and IT-Lazio have comparatively high deficits in milk of -1.9 to -1.4 mill t.

USA and China - regional milk surplus and deficit: The regions with milk surplus are in the North and the western part of the country. Those with milk deficit are in the southeast producing only 15-25% of the milk which is consumed. This means large milk volumes may be transported up to 2,000-3,000 km within these two countries from surplus to deficit regions. The amount of milk transported, which is the sum of regional surplus milk, is approximately 37 million t in the USA (2010) and 19 million t in China (2009). This is a very large amount when compared to the global trade volume of dairy products (50-60 million t milk equivalents, excluding EU-intra trade).

Land prices – time series for selected countries 1996-2010 (see Chapter 3.7)

For the first time, **land purchase prices** are shown for selected countries as a time series, including some key facts on their development. Generally, a strong rise in land prices can be observed for most countries (see also Country Pages), especially after 2000. In some cases this development led to a “price bubble”, where the assets were traded at inflated prices (e.g. Denmark). The prices decreased, triggered by the global financial crisis in 2009/2010. Land prices were not affected by the financial crisis in some countries, such as Brazil and Germany, where demand and competition for land remained high, thus supporting land prices.

Cull cow and quota prices, time series for selected countries 1996-2010 (see Chapter 3.7)

Generally the **cull cow prices** showed high diversity, but mostly reflected the downwards trend during the global financial crisis in 2009. In some countries, prices tended upwards in 2010, due to strong internal

demand and / or the improved world market prices for beef.

Prices for milk quota were very diverse and ranged from 0 in the United Kingdom to 2.77 US-\$ in Canada. Drivers for high or low quota prices are the profitability of dairy farming, the willingness of dairy farmers to grow or to stop business and government regulations which affect the quota markets. In the EU-27 additional drivers are the end of the quota system in 2015 and the super-levy which has to be paid by the farmers who over-deliver their quota (in case the country as a whole is over-quota).

Farm structure – Farm number, size and milk per farm (see Chapter 3.8)

IFCN estimate of dairy farms in the world 2010

The total number of dairy farms in the world was estimated in 2009 at over 141 million. The approach in 2011 is based on the Country Page Analysis due to difficulty in obtaining data and facts. The number of dairy farms analysed in 90 countries add up to 117.9 million (including estimations for some countries) and represent 98% of cow and buffalo milk production. The average herd size is 3 cows and / or buffalos per farm. The average milk production per farm is 5.9 tons per year. The total farm number may be underestimated although the results of this approach are more reliable.

Number of dairy farms – status and development

The greatest number of dairy farms was found in India (78 mill), and Pakistan (7.4 mill) (both estimations based on census data and trend progression) and Russia (3.2 mill). Ethiopia, China, Ukraine, Uzbekistan, Kenya and Uganda have 1.7-2.2 million dairy farms each. In comparison to these countries, the farm numbers in the USA with 62,500 or in New Zealand with 11,700 appear relatively small.

The development of the number of dairy farms 2006 to 2010 shows that numbers are decreasing by 0.5% per year or more in nearly two thirds of the countries. The average annual change in EU-27 was -7.8%, while in the USA and Canada it was -4.2%. In about 20% of the countries, farm numbers are increasing by over 0.5% per year. A trend reversal has taken place in China; since 2008, the year of the Melamine Crisis: farm numbers are decreasing after a strong increase as from 2000.

Dairy farm size 2010

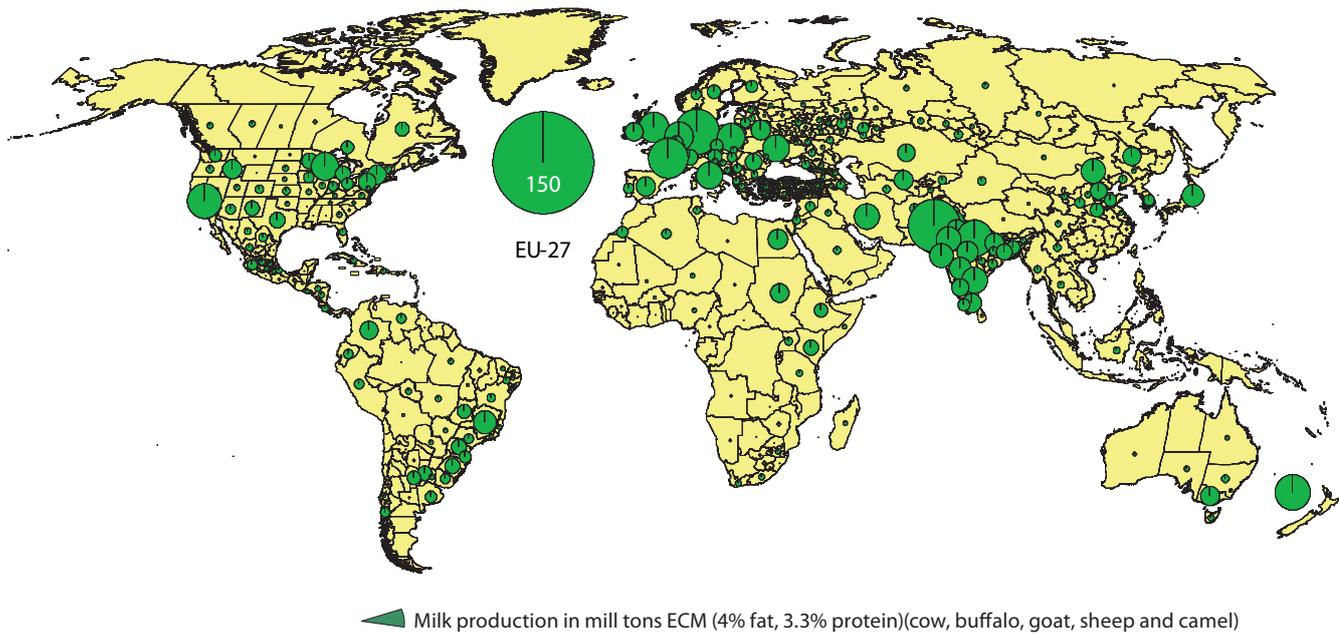
The world average farm size was 3 cows per farm in 2010. In over 40% of the countries, the average farm size was below 10 cows. This was the case in most countries in Asia, East Europe and CIS, many African countries, as well as in Peru and Ecuador. Only 10 countries had an average farm size between 50 and 100 cows. The eleven countries with more than 100 cows per farm were (ordered by size): Saudi Arabia, New Zealand, Australia, South Africa, the Czech Republic, Argentina, USA, Denmark, Israel, United Kingdom and Cyprus (please note: for Cyprus total cattle is included in the statistics). The average farm size in the EU-27 was 12.3 cows per farm; a further breakdown pinpoints 45 cows per farm in the EU-15 countries and 3.8 cows per farm in the 12 new EU member countries.

Milk per farm – annual growth rates 2006-2010

Variations in the amount of milk produced per farm can be used as an indicator of a structural change which is a major driver for milk production. The highest growth rates of over 10% per year were found in Estonia, Belarus, Morocco, Croatia, Turkey, South Africa, Iran, Spain, Latvia, Lithuania, Denmark, Portugal, Greece and Chile. In 17% of the countries, a negative development was observed.

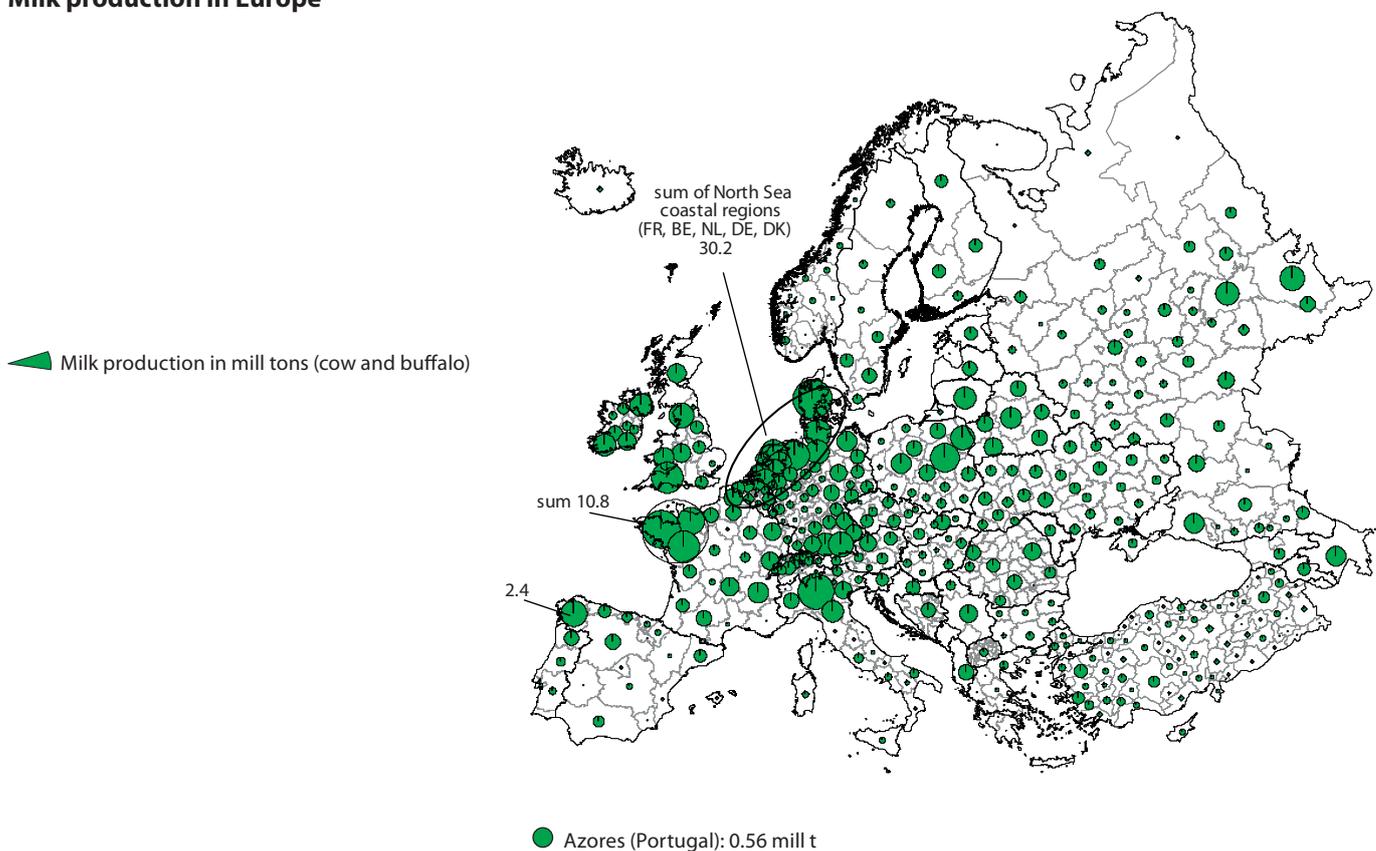
3.2 Milk production volumes 2010

Milk production world-wide



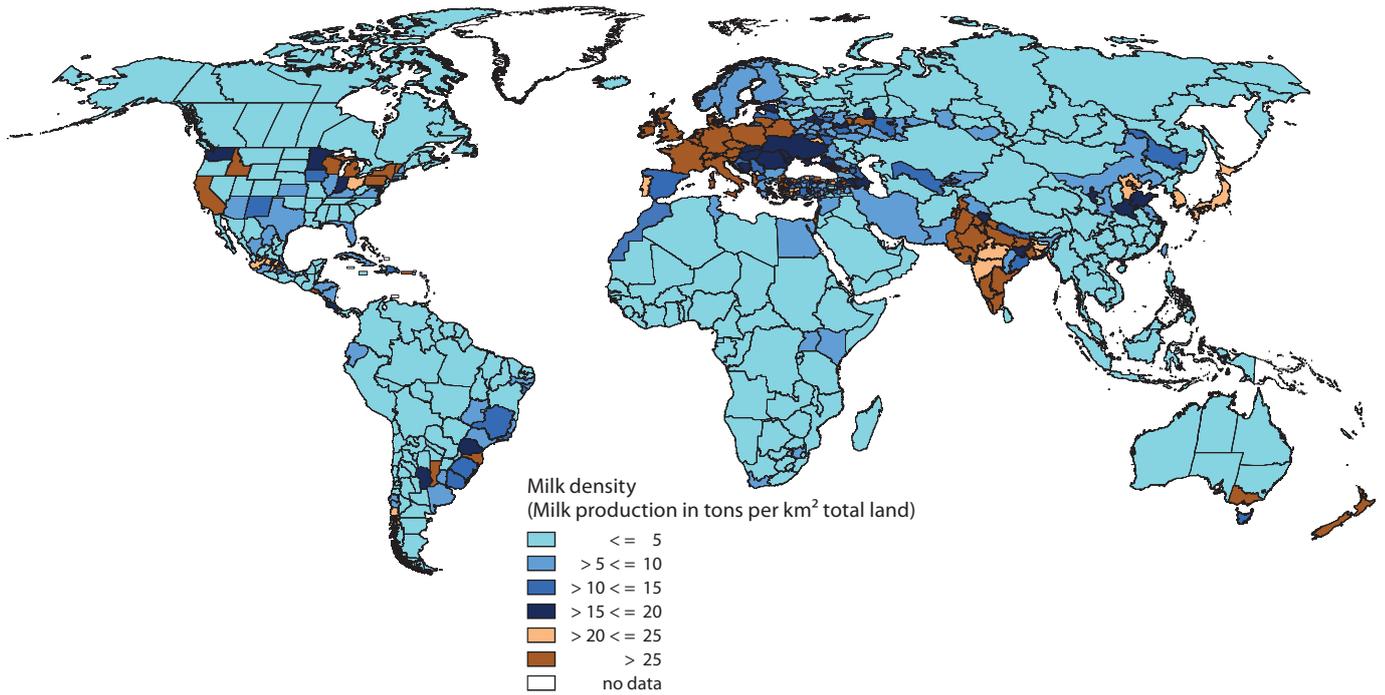
Data: Country data: Milk production 2010 in ECM. Regional data: Milk production 2010 (cow and buffalo) in natural fat and protein content. If not available 2009 data for CN, IN, TR, 2008 data for AR.
Source of data: National statistics, FAO, for some countries estimates.

Milk production in Europe



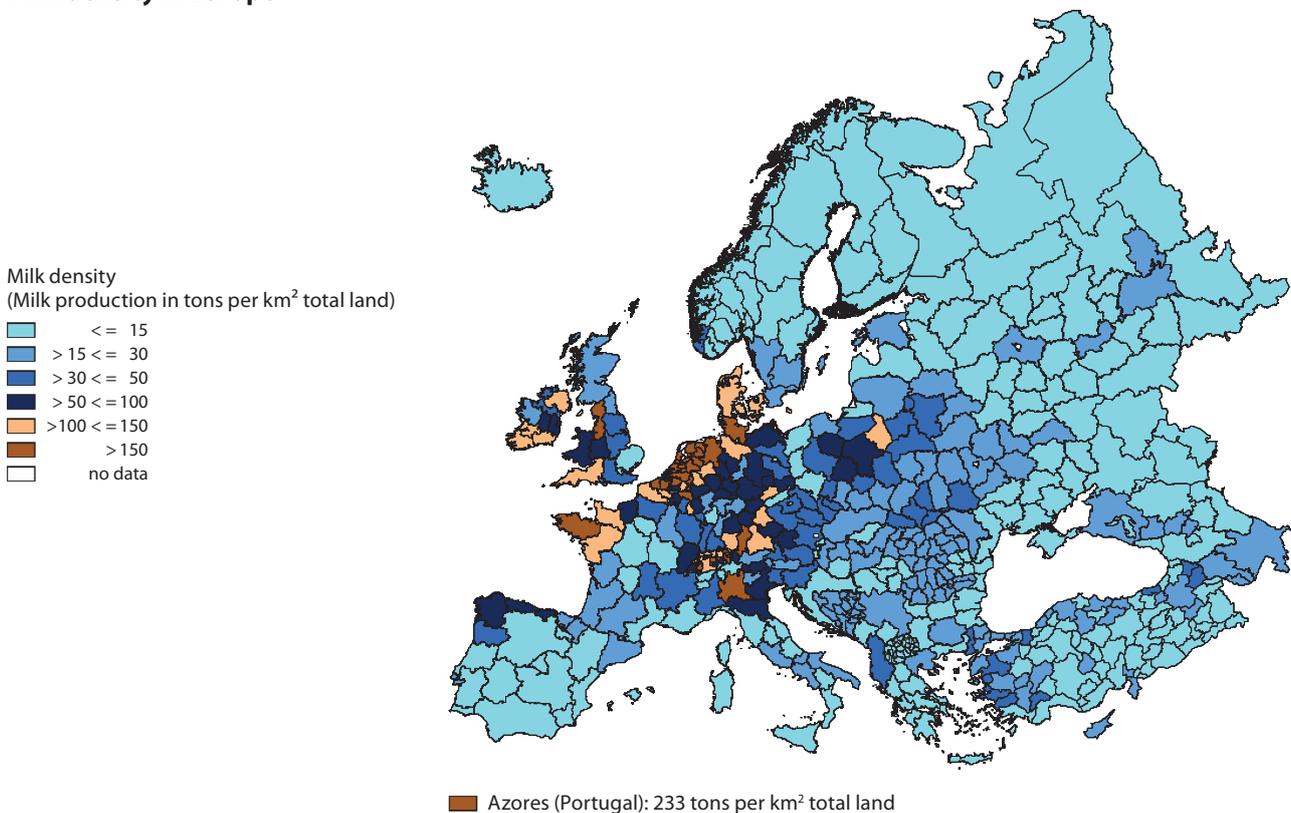
Data: 2010 in natural fat and protein content. If not available 2009 data was taken (BE, CH, FR, HU, NO, PT, RO, TR), 2008 data for IE.
Source of data: National statistics, EUROSTAT and estimates.

Milk density world-wide



Data: 2010 or if not available 2009 data was taken for CN, IN, TR, 2008 data for AR. Country data in ECM, regional data in natural fat and protein content.
Source of data: National statistics, FAO, for some countries estimates.
Calculation: Milk production divided by km² total land.

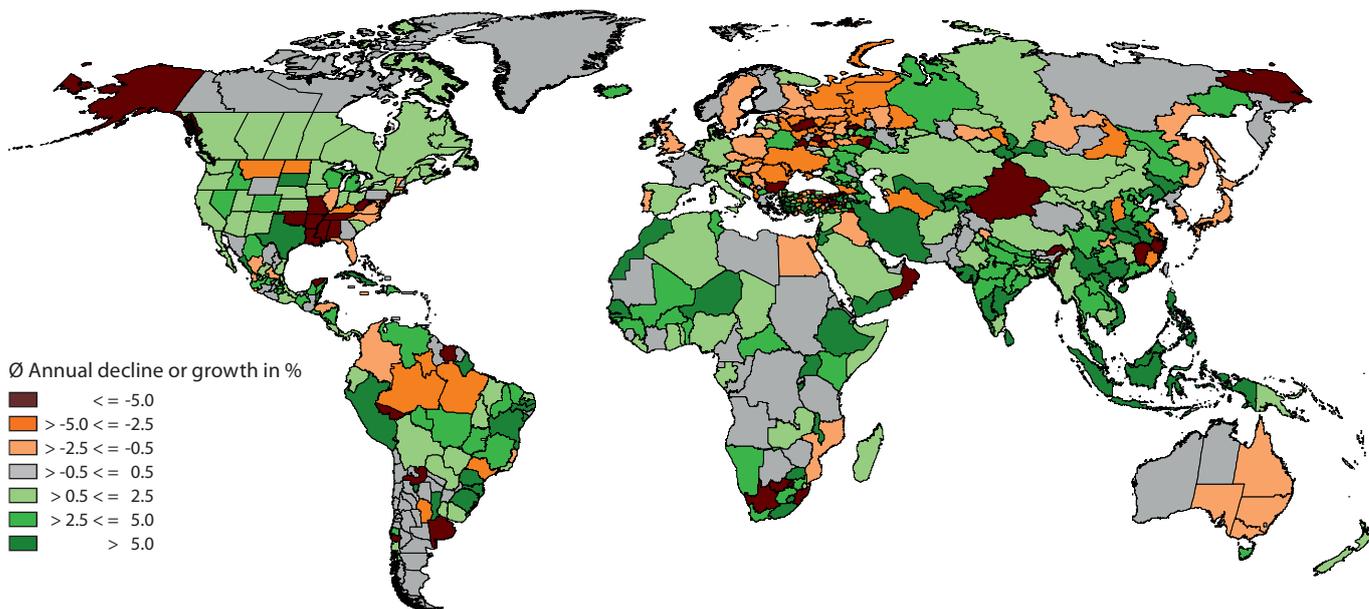
Milk density in Europe



Data: 2010 in natural fat and protein content or if not available 2009 data was taken (BE, CH, FR, HU, NO, PT, RO, TR), 2008 data for IE.
Source of data: National statistics, EUROSTAT and estimates.
Calculation: Milk production divided by km² total land.

3.4 Percentage change in milk production 2006-2010

Annual change in milk production world-wide

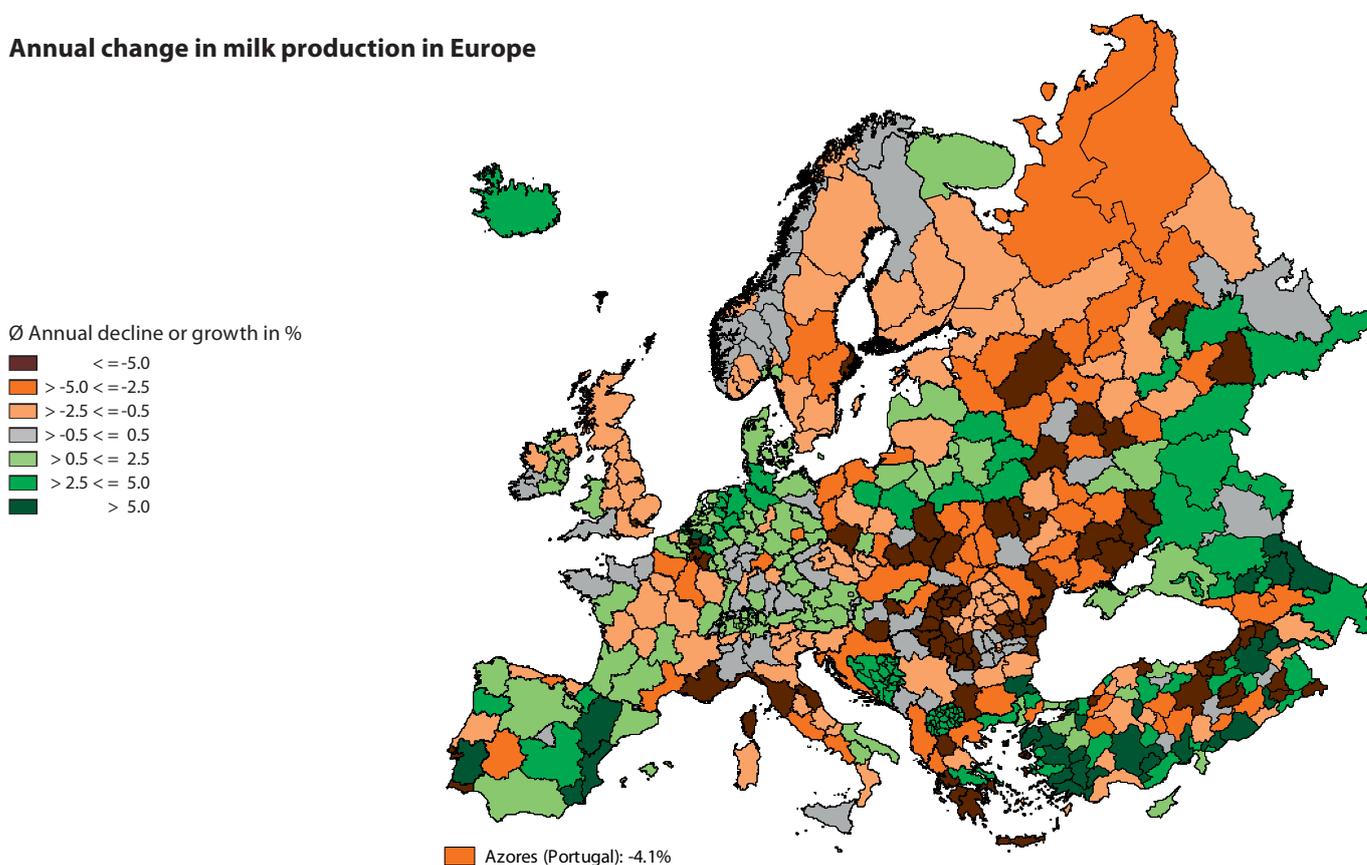


Data: 2010 and 2006 in ECM. If not available 2009 data was taken for CN, IN, TR, 2008 data for AR.

Source of data: National statistics, FAO, for some countries estimates.

Calculation: $(\text{data 2010 divided by data 2006})^{(1/4)} - 1$.

Annual change in milk production in Europe

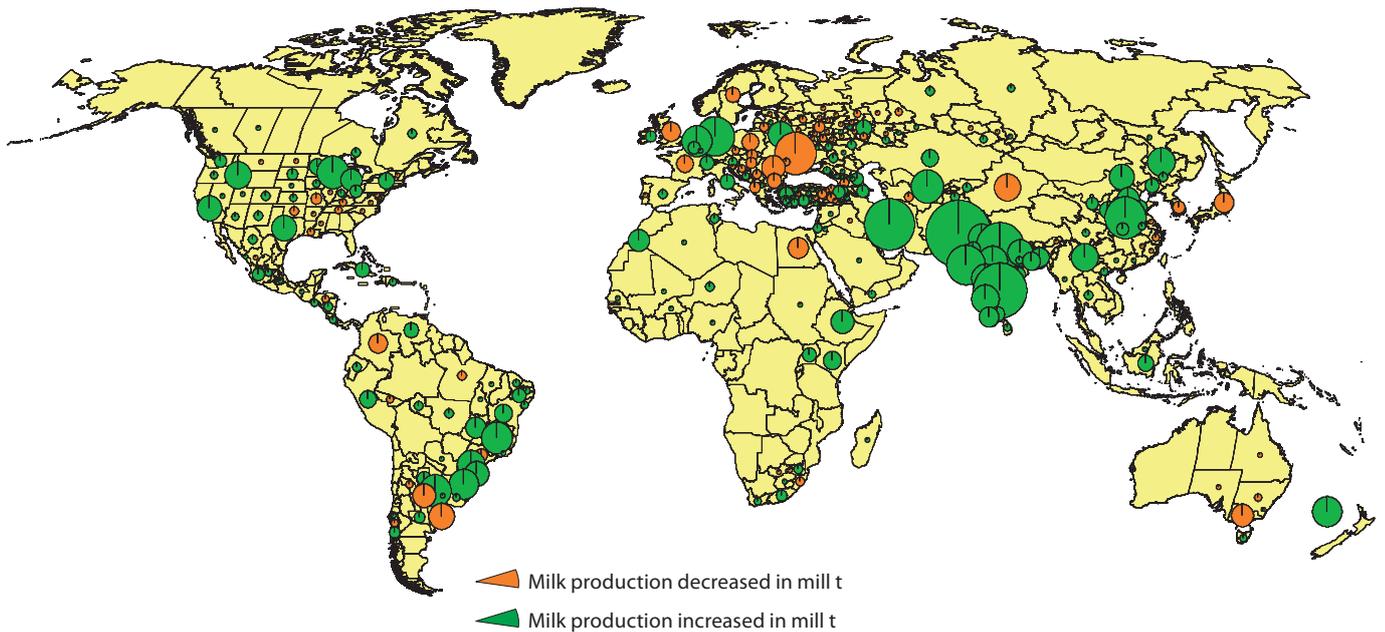


Data: 2010 and 2006 in natural fat and protein content. If not available 2009 data was taken (BE, CH, FR, HU, NO, PT, RO, TR), 2008 data for IE.

Source of data: National statistics, EUROSTAT and estimates.

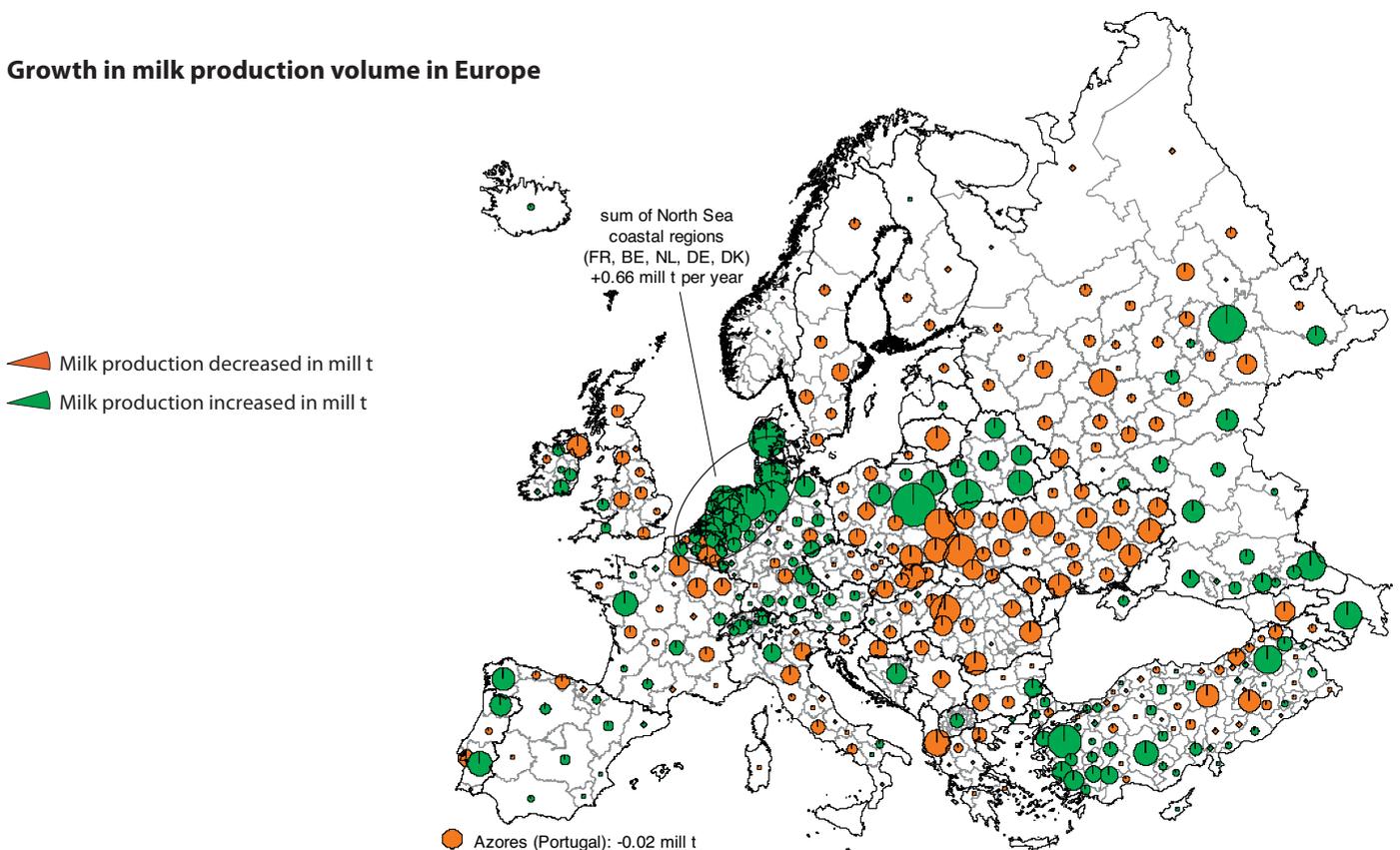
Calculation: $(\text{data 2010 divided by data 2006})^{(1/4)} - 1$.

Growth in milk production volume world-wide



Data: 2010 and 2006 on country level in ECM, regional data in natural fat and protein content. 2010 or if not available 2009 data was taken for CN, IN, TR, 2008 and 2005 data for AR. China Xinjiang region: change in official estimation procedure 2007/2008.
Source of data: National statistics, FAO, for some countries estimates.
Calculation: (Milk production 2010 minus milk production 2006) divided by 4.

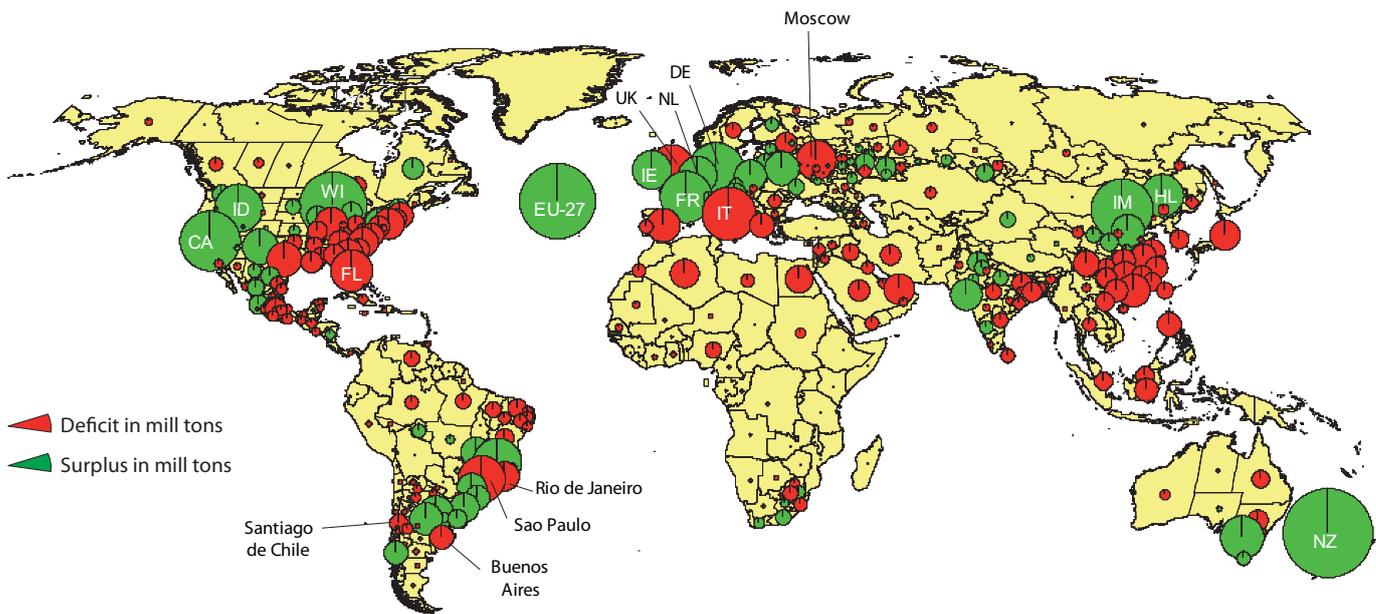
Growth in milk production volume in Europe



Data: 2010 and 2006 in natural fat and protein content. If not available 2009 data was taken (BE, CH, FR, HU, NO, RO, TR), 2009 and 2007 data for PT, 2008 and 2006 data for IE.
Source of data: National statistics, EUROSTAT and estimates.
Calculation: (Milk production 2010 minus milk production 2006) divided by 4.

3.6 Milk surplus and deficit in 2010

Milk surplus and deficit world-wide



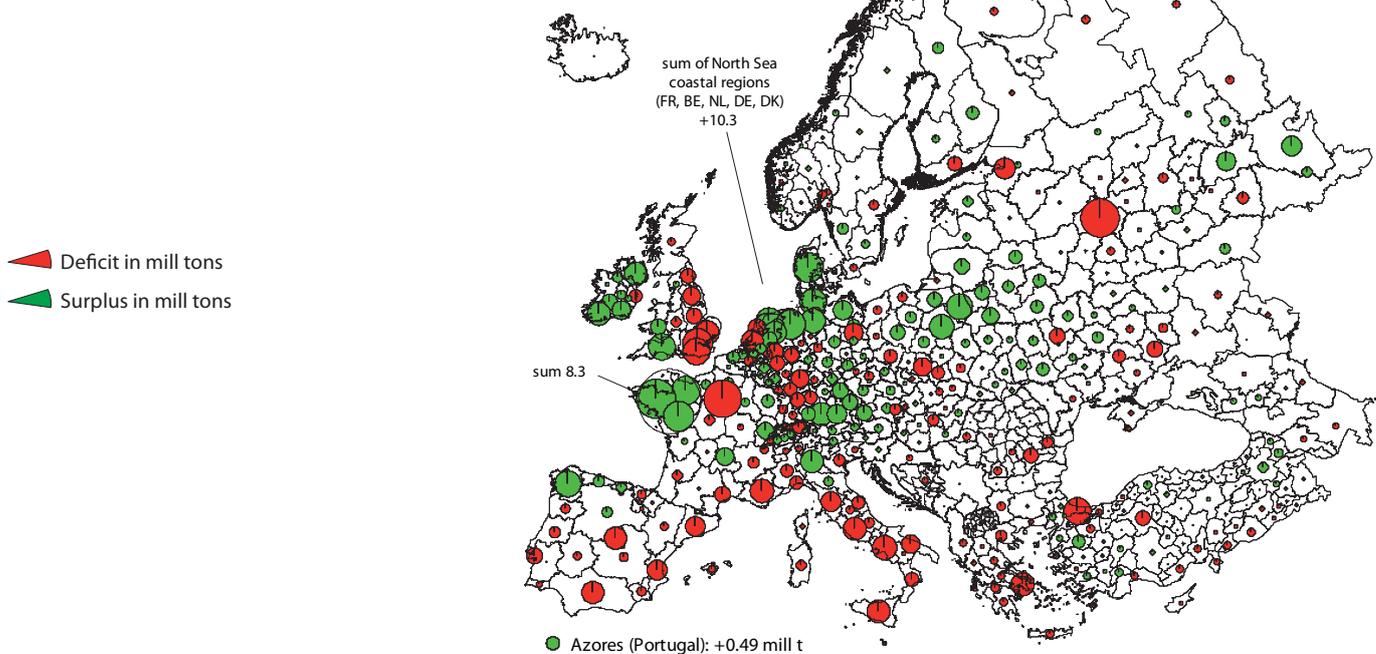
Data: 2010 on country level in ECM, regional data in natural fat and protein content. 2010 or if not available 2009 data was taken for CN, IN, TR, 2008 data for AR.

Source of data: National statistics, FAO, for some countries estimates and IFCN calculations.

Calculation of surplus or deficit per country or region: Milk production minus milk demand. Regional demand: Regional population and country average per capita milk consumption. Additional assumption for India: Not delivered milk is consumed in the region where it is produced.

Remarks: Moscow region and city shown as one, Buenos Aires region and city shown as one, Santiago de Chile = Metropolitana region. Regional abbreviations: USA: CA = California, ID = Idaho, WI = Wisconsin, FL = Florida. China: IM = Inner Mongolia, HL = Heilongjiang Sheng.

Milk surplus and deficit in Europe



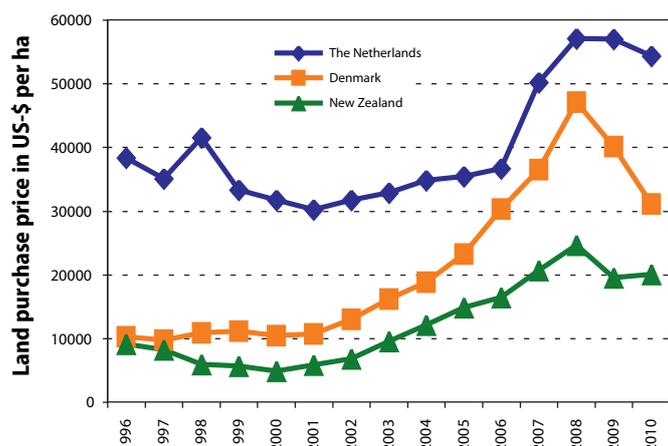
Data: 2010 in natural fat and protein content. If not available 2009 data was taken (BE, CH, FR, HU, NO, PT, RO, TR), 2008 data for IE.

Source of data: National statistics, EUROSTAT and estimates and IFCN calculations.

Calculation of surplus or deficit per region: Milk production minus milk demand. Regional demand: Regional population and country average per capita milk consumption.

3.7 Land prices, cull cow and quota prices

Land purchase price

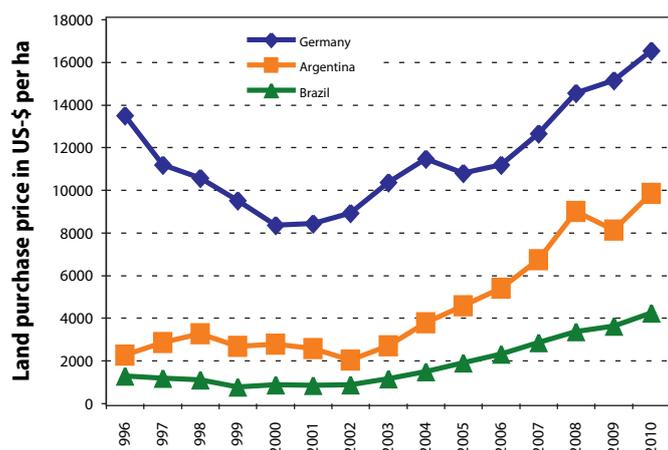


New Zealand: Land prices rose steadily for a number of years until the global financial crisis hit and the supply of credit was restricted. Fewer buyers resulted in less demand for land and prices decreased. Consequently the equity of those farms was reduced, with debt restricting their ability to purchase more land, which, in turn, reduced the demand even further. It is an unusual situation to have had such high returns and yet static/declining land values

Denmark: Since 2002 the land prices in Denmark have increased, up to 125000 DKK. Due to the financial crisis and its consequences, they decreased during the last year.

The Netherlands: Land prices are very high, giving great equity to a farm and making it easier to obtain a loan.

Land purchase price

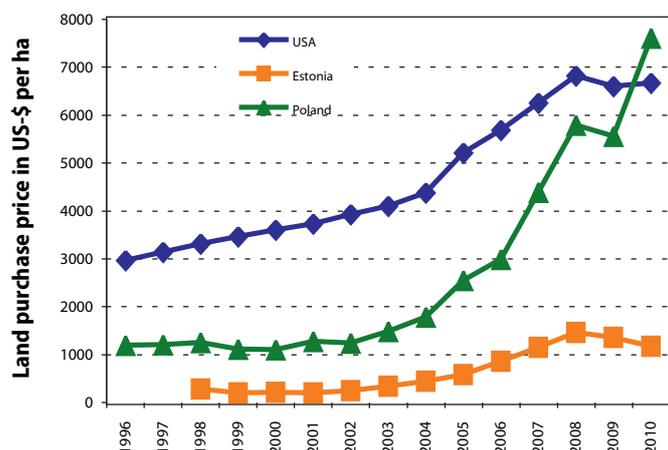


Brazil: Price of land has been increasing. The economic growth and the production of grain were the main reasons for the search for land. In the Paraná and the Central-West region the reasons were also investments in new productive units for chicken and milk production. The Central-West region had the highest valuation.

Germany: In recent years competition of dairy vs biogas. Biogas only occupies 3% of agricultural land

Argentina: Competition for land as a price driver: soy beans vs dairy.

Land purchase price

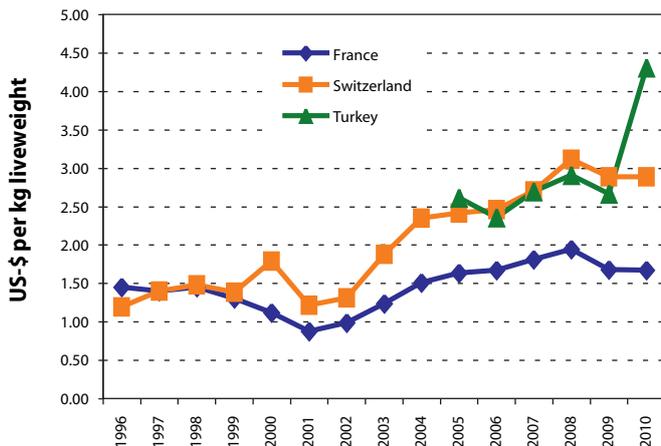


Poland: There was a strong increase in land prices after joining the EU in 2004, on average +36% per year from 2005 to 2008. As for many other countries, land prices dropped in the year of the financial crisis (-4%), but there was a strong rebound in 2010 (+37%).

Estonia: Also in Estonia, land prices increased after joining the EU in 2004 (2005-2008 $\bar{\Delta}$ +31% per year), but remained on a comparatively low level. Prices have decreased since 2009.

USA: A steady increase in land prices up to 6800 US-\$/ha in 2008. There was a slight decrease of -3% in 2009, the year of the financial crisis. However, prices became stable in 2010.

Cull cow prices

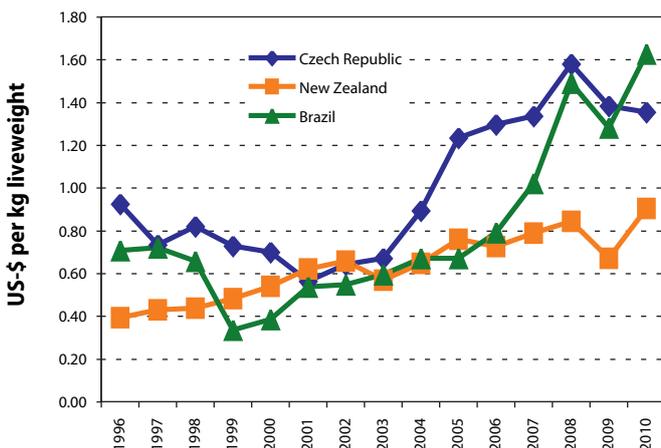


Turkey: In 2008 there was a decrease in milk prices which resulted in a huge amount of cattle going to slaughter. Afterwards the meat prices increased and the government permitted the import of meat, live cattle and breeding cattle. The meat prices did not slow down.

France: In 2010, cull cow prices were at 1.7 US-\$ per kg liveweight, above the EU-27 average of 1.3 US-\$ (EU-15: 1.4 US-\$, EU-12: 1.1 US-\$). The development reflects that in other EU countries, with declining prices until 2001. This coincides with the peak of BSE cases in EU (UK excluded) in 2001/2002. After that, prices increased until 2008. In 2009 prices dropped again, but seemed to stabilise in 2010.

Switzerland: Cull cow prices remained stable after BSE crisis. In November 1990 the first cow died in Switzerland of BSE. It took until 2004 for the Swiss cattle exports to recover.

Cull cow prices

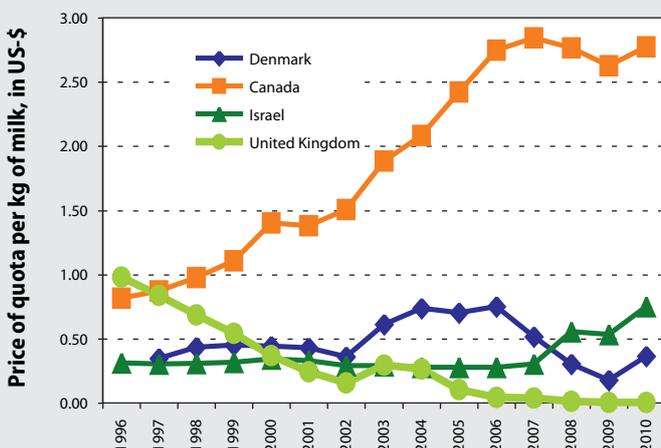


Brazil: Cull cow prices, as beef, grew at a high rate from 2006 to 2008 when they reached a peak. This followed the same trend as other food prices in the world. Due to lower cull cow prices in 2009, the dairy farmers sent fewer cows to slaughter. This explains, in part, the relatively high growth of milk production in 2009 (+5.5%). In 2010 beef prices reached the level of 2008. But, in 2010 the farmers received much higher prices for milk which was a driver for keeping cows to increase milk production per farm, expected also at 5.5%.

Czech Republic: Low milk price in 2009 resulted in reduction of dairy herd. High offer of dairy cows for slaughter in 2009 and 2010 reduced cull cow price.

New Zealand: Cow prices in 2010 reflected the improved world price for beef. Cull cows go to the US as ground beef.

Quota purchase price



Denmark: Increased production to improve cash flow resulted in overproduction in 2010/11. By the end of the year farmers were willing to pay a high quota price rather than having to pay the super levy. Therefore the increase in quota price is a result of this short term focus.

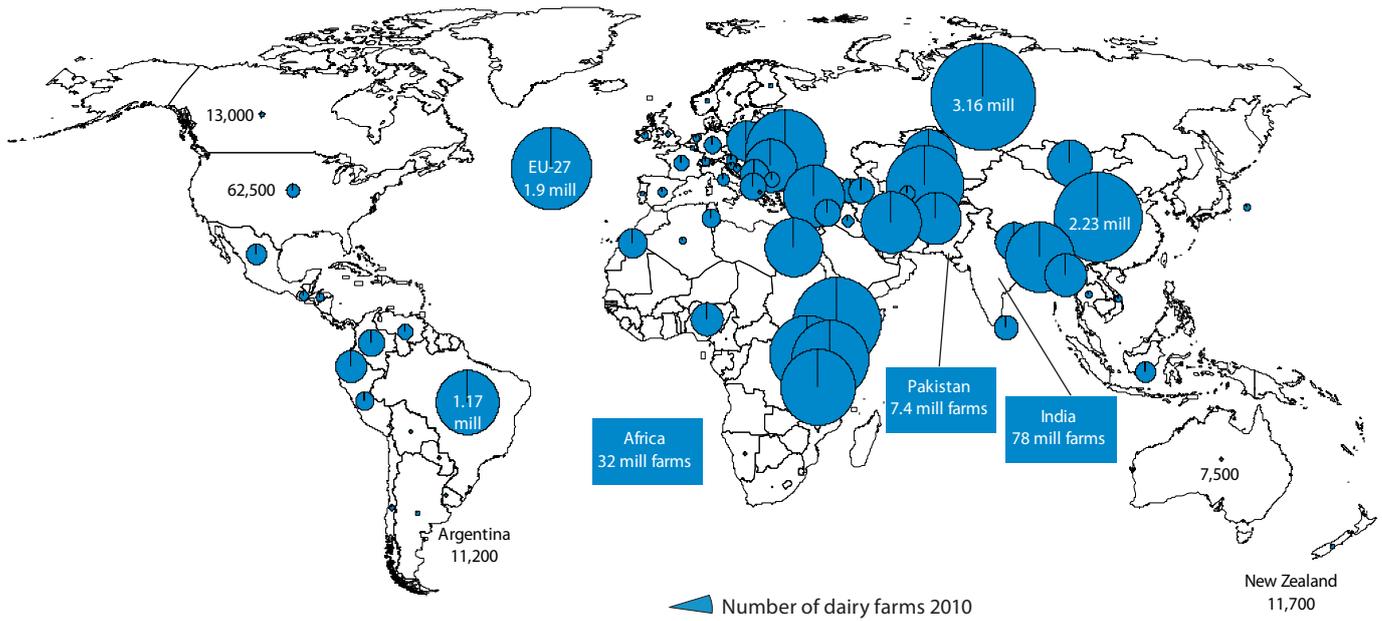
Canada: Quota amortisation over a one-year period. The increase in the quota price (in US-\$) is influenced by the exchange rate developments; the US-\$ decreased against the Canadian Dollar (CAD) in recent years (1 US-\$ = 1.03 CAD in 2010 while 1 US-\$ = 1.40 CAD in 2003).

United Kingdom: Asset melting started earlier than in most EU-27 countries (quota ending 2015).

Israel: No quota market for the cooperative sector (larger farms), since no sales are taking place.

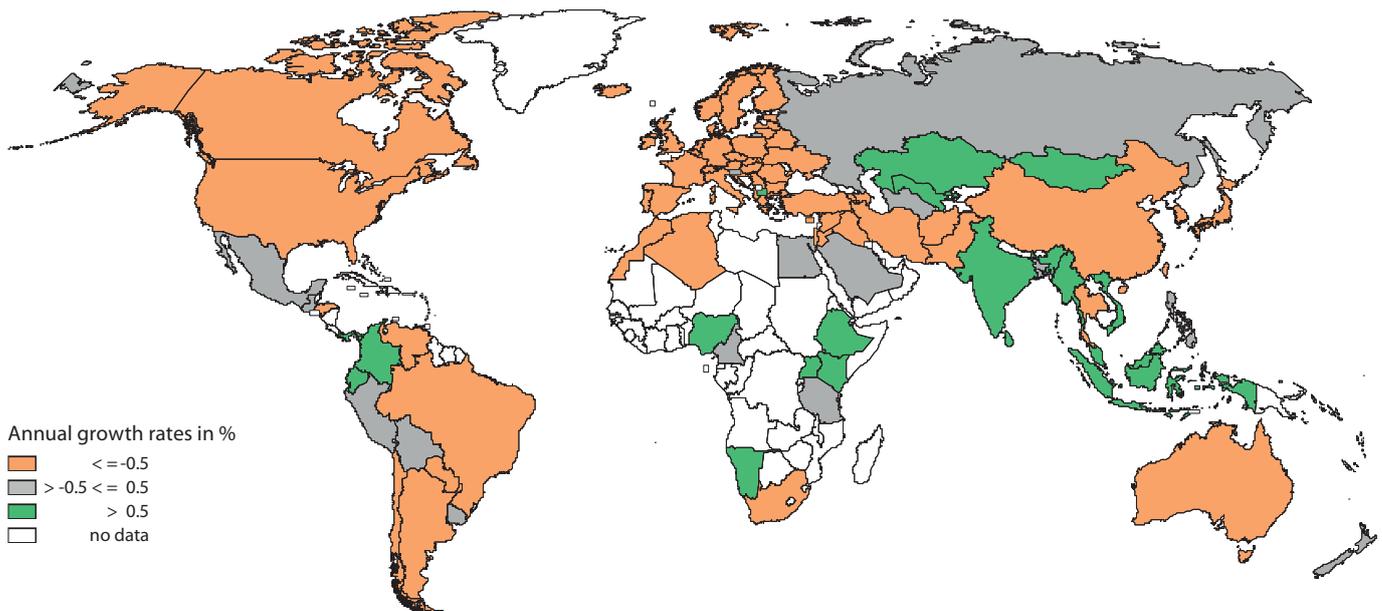
3.8 Farm structure – Status and development in dairy farm numbers

Number of dairy farms in 2010



Source of data: National statistics and estimates.

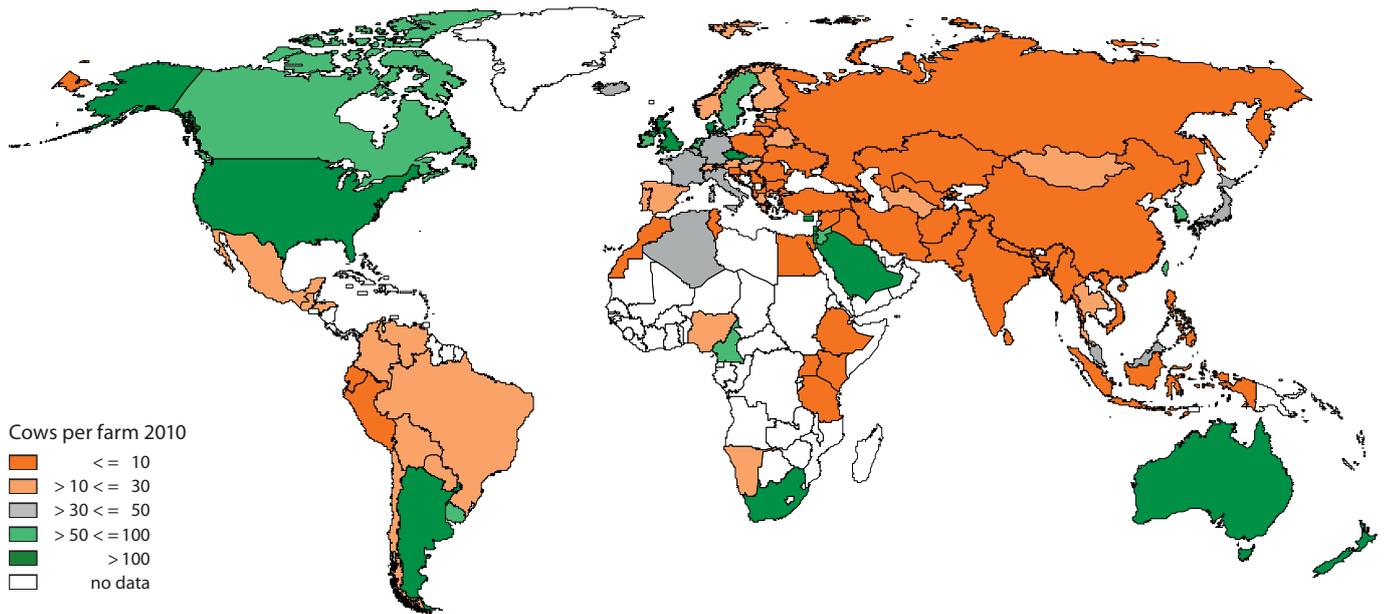
Number of dairy farms – annual growth rates 2006-2010



Source of data: National statistics and estimates.

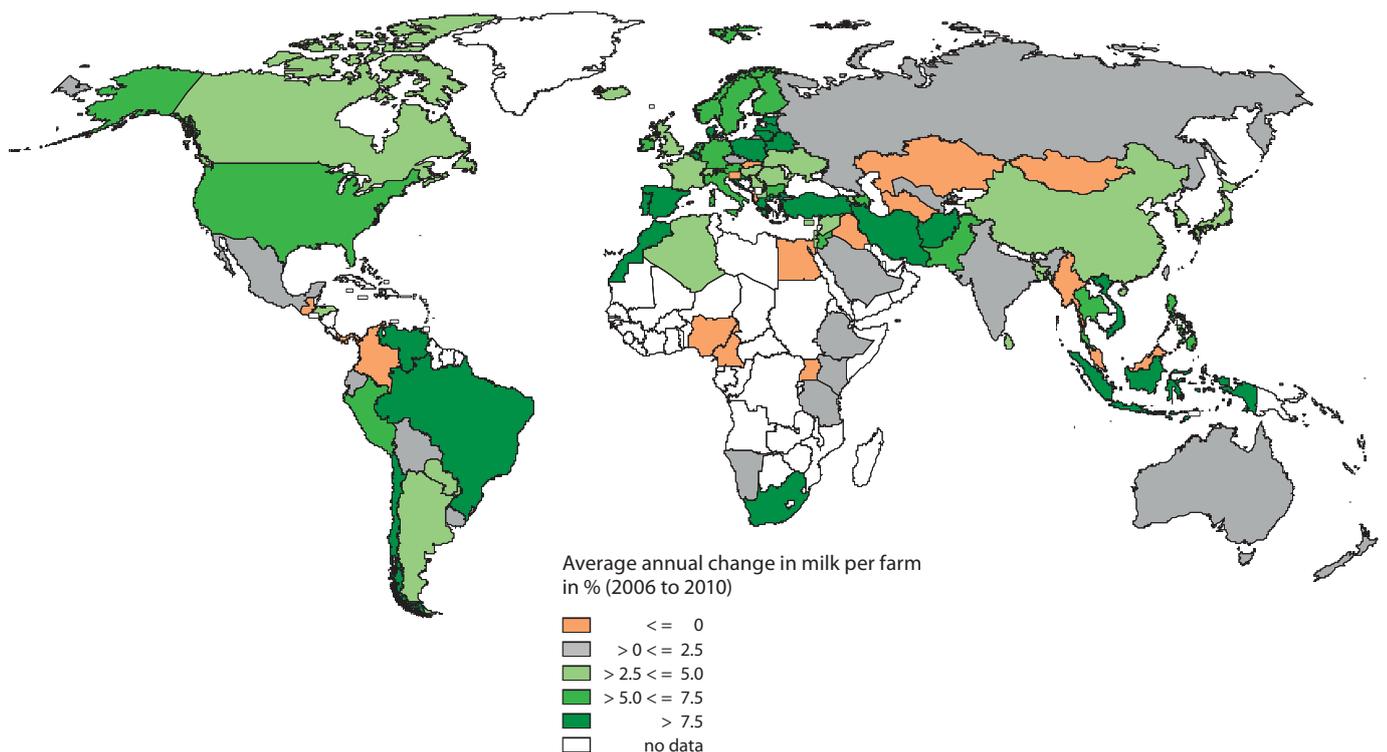
Calculation: $(\text{data 2010} / \text{data 2006})^{1/4} - 1$.

Dairy farm structure – average farm size in 2010



Source of data: National statistics and estimates.

Milk per farm – annual growth rates 2006-2010



Source of data: National statistics and estimates.

Calculation: $(\text{data 2010} / \text{data 2006})^{1/4} - 1$. Milk per farm: Production (cow and buffalo) divided by dairy farm number.

Introduction

The focus of this year's Country Page is on milk production and farm structure developments (Chapters 3.10-3.99). The main aim is the creation of a profile that is comparable among the countries. In this chapter a method description is given of the different analyses made.

Status and key developments (see text box)

Goal: To illustrate at a glance the development of the milk production sector.

Method: **Status 2010:** The milk production and number of dairy farm figures are taken from the table below. The share of milk produced on farms with more than 50 cows is calculated from farm structure data or, if available, is based on national statistics. The relation of the national milk and feed price to world market prices for milk and feed is calculated from average annual prices in national currency.

Key developments 2006-2010: Milk production growth is taken from the table below. The share of time the milk price was above (or below) the world market level is calculated from the number of years the average national price was above the world market price during 2006 to 2010 (if available). The percentage of the national milk and feed price, above or below the respective world market prices, were calculated as the arithmetic mean of the national price in relation to the arithmetic mean of the world market price 2006 to 2010. The milk : feed price ratio is explained in detail in Chapter 2.7. The share of time where the milk : feed price ratio was above 1.5 (favourable), represents the number of years, where the ratio was above 1.5 during 2006 to 2010 (if available).

Results for Afghanistan: With 1.6 mill t cow milk production, Afghanistan is on place 48 in the global ranking of milk producing countries and over 3 million families have dairy cows. The national milk price is low compared to the world market and the feed price is high. As a result, the milk : feed price ratio stays below 1.5.

Regional milk density (see map)

Goal: To point out regions with a high concentration of milk production within each country.

Method: The map relies on regional statistics on milk production divided by the area of total land. In some countries the national milk production statistics and the regional statistics are not complementary. The scale was adjusted to each country specifically to show regions of higher milk density (brown) compared to regions with lower milk density (blue). For nine countries where milk production was not available on regional level, the map shows average milk density for the whole country. In these cases, the colouring was adjusted to correspond with the world milk density map in Chapter 3.3.

Results for Afghanistan: Since no regional information was available, the map shows the country average of 2.49 t milk per km² total land. The light blue colour indicates that this is a low milk density.



Key variables

Milk production (see table)

Goal: To illustrate milk production trends and its drivers: milk yield and cow numbers.

Method: The figures in the table are based on cow's milk and, in selected countries, also on buffalo's milk. The quantities have been converted to million metric tons ECM (energy corrected milk with 4.0% fat and 3.3% protein). The cow number shown includes the lactating and dry adult dairy cows and, if mentioned, buffalos. The milk yield is calculated based on both parameters described above and therefore also shown in ECM.

Results for Afghanistan: Milk production increased by 1.8% per year in the period 2006-2010. It is interesting to note that this development was driven mainly by increasing cow numbers (+1.5% per year), as the milk yield only increased 0.3% per year in this period.

Farm structure (see table + graphs)

Goal: To show the development of farm number and size as well as the trends in farm structure.

Method: The figures in the table and charts are based on national farm structure statistics. In the left chart the typical farms presented in Chapter 1 are plotted in the respective size class. This helps to visually range the typical farms into the statistics. We are currently working on a method to allocate the typical farms exactly to the specific share of dairy farms and cows they represent in each country. Apart from the farms shown from Chapter 1, more typical farms are analysed in the Farm Comparison (see Annex 5).

Results for Afghanistan: The FAO census states that 3.04 million families were dairy farmers in 2003, with an average herd size of 1.3 cows per farm. No detailed farm structure information is available for Afghanistan.

Prices in national currency (see table)

Goal: To illustrate the development of key prices relevant to dairy farmers.

Method: The data is taken from national statistics or in some cases are estimated. The milk : feed price ratio is calculated as milk price divided by feed price (see Chapter 2.7).

Results for Afghanistan: In the period 2006-2010 the cull cow prices increased on average by 5.1%. The milk : feed price ratio decreased in this period by -1.2% per year.

Milk and feed prices (see graphs)

Goal: To put the development of prices for milk and feed into perspective.

Method: The milk price is based on national statistics and has been converted into ECM. The feed price is calculated from the raw materials soybean meal (30%) and corn or barley (70%) (see Chapter 2.6). Even though these feedstuffs are not fed to cows in a number of countries, this calculation represents a comparable indicator among the countries. The annual world feed price (represented by the IFCN feed price indicator) is shown in the chart, to put the national feed price into perspective in relation to the world. This is important since feed costs represent the major part of production costs. The monthly 2011 milk price data is preliminary and partly estimated.

Results for Afghanistan: The monthly milk price in Afghanistan has a staircase-like pattern which is distinct from the pattern observed on the world market. The national price is not as volatile as observed on the world market, instead it is continuously increasing.

STATUS AND KEY DEVELOPMENTS

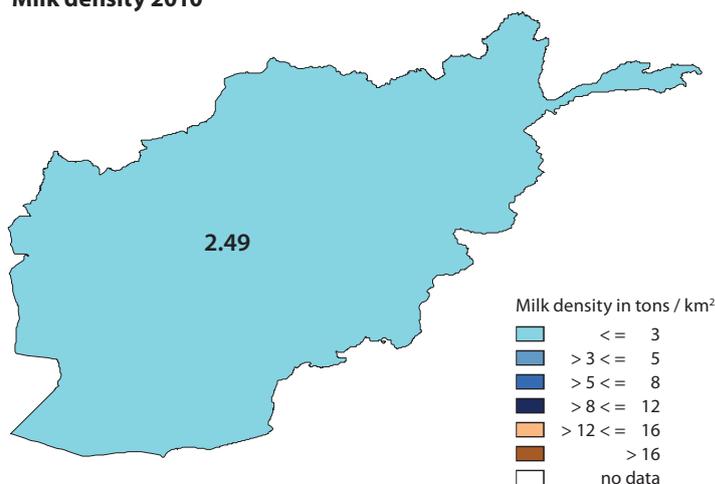
Status 2010

- Milk production (cow's): 1.6 mill t ECM (number 48 in the world)
- No. of dairy farms: 3.04 mill families (FAO census 2003)
- Milk price: -12% to world market
- Feed price: 18% to world market

Key developments 2006-2010

- Milk production growth: +1.8% per year
- Share of time milk price was above world market level: 40%
- Milk price was on average -15% below the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

Milk density 2010



Key variables

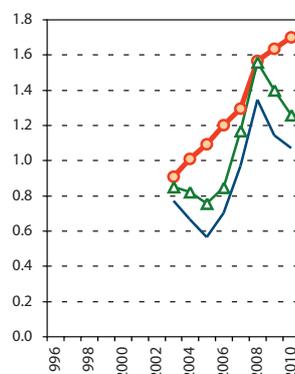
	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates				
									1996-2010	2006-10			
Milk production in ECM (cow's)													
Production (mill t)	1.41	1.85	1.30	1.41	1.50	1.50	1.61	1.61	1.0%	1.8%			
Cows (in 1,000's)	2,641	3,008	2,249	3,715	3,494	3,835	4,068	4,068	3.1%	1.5%			
Milk yield (t/cow/year)	0.5	0.6	0.6	0.4	0.4	0.4	0.4	0.4	-2.1%	0.3%			
Farm structure													
No. of dairy farms (in 1,000's)									2003:				
Average farm size (cows/farm)									3,040				
Prices in national currency													
Milk : feed price ratio									1.2	1.4	1.0	1.4	-1.2%
Cull cow (AFN / kg live weight)	60.00	75.00	80.00	90.00	120.00	160.00	170.00	195.44	8.8%	5.1%			
Land - buy (1,000 AFN / ha)													



Milk and feed price

1,000 AFN / 100 kg

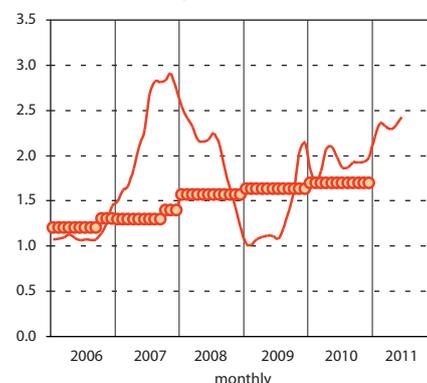
- National milk price
- △ National feed price
- IFCN feed price indicator (world)



Farm gate milk prices

1,000 AFN / 100 kg milk (ECM)

- National price
- IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Milk production and cow numbers 2009-2010 following the trend. Corn price 2008-2010. Cull cow price 2009-2010. Monthly milk prices 2008-2010: annual averages.

Remarks: Since no statistical information on soybean meal prices are available the world market price is used.

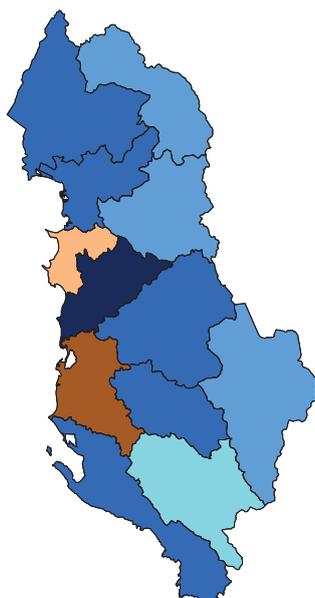
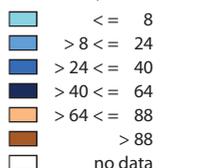


Ilir Kapaj



Milk density 2010

Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 0.9 mill t ECM (number 65 in the world)
- No. of dairy farms: 223,158
- Share of milk produced in farms with more than 50 cows: 2%
- Milk price: -5% to world market
- Feed price: 103% to world market

Key developments 2006-2010

- Milk production growth: -4.1% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average 1% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

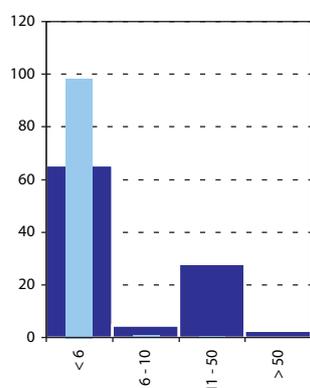
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.87	0.71	0.80	0.86	0.89	1.09	1.02	0.92	0.4%	-4.1%
Cows (in 1,000's)	483	423	448	435	439	420	360	362	-2.0%	-3.6%
Milk yield (t/cow/year)	1.8	1.7	1.8	2.0	2.0	2.6	2.8	2.5	2.5%	-0.5%
Farm structure										
No. of dairy farms (in 1,000's)					256	256	254	223		-3.4%
Average farm size (cows/farm)					1.7	1.6	1.4	1.6		-0.3%
Prices in national currency										
Milk : feed price ratio	0.5	0.5	0.6	0.7	0.7	0.7	0.9	0.8	3.4%	2.9%
Cull cow (ALL / kg live weight)	310	310	320	330	340	340	390	396	1.8%	3.9%
Land - buy (1,000 ALL / ha)										

Farm structure

% of dairy farms and cows in size classes (2010)

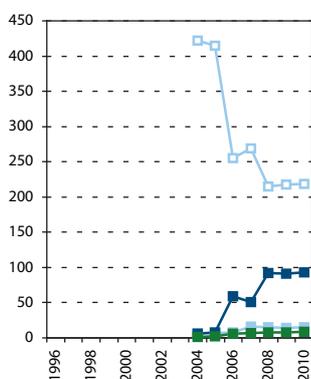
■ Cows per size class
■ Farms per size class



Farm structure

cows per herd size (in 1,000's)

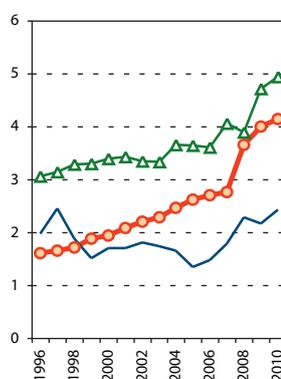
□ 1 - 6 ■ 6 - 10
■ 11 - 50 ■ > 50



Milk and feed price

1,000 ALL / 100 kg

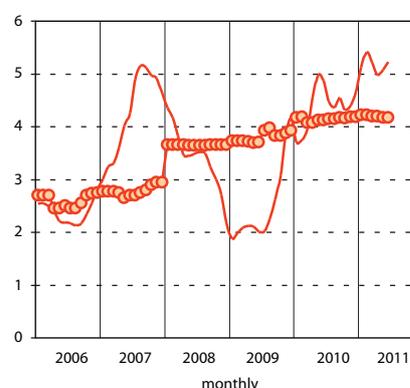
○ National milk price
△ National feed price
■ IFCN feed price indicator (world)



Farm gate milk prices

1,000 ALL / 100 kg milk (ECM)

○ National price
○ IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Dairy farm number 2010.

Remarks: Milk price 1996-2007: Price is based on a dairy processor's price given to the farmers.



STATUS AND KEY DEVELOPMENTS

Status 2010

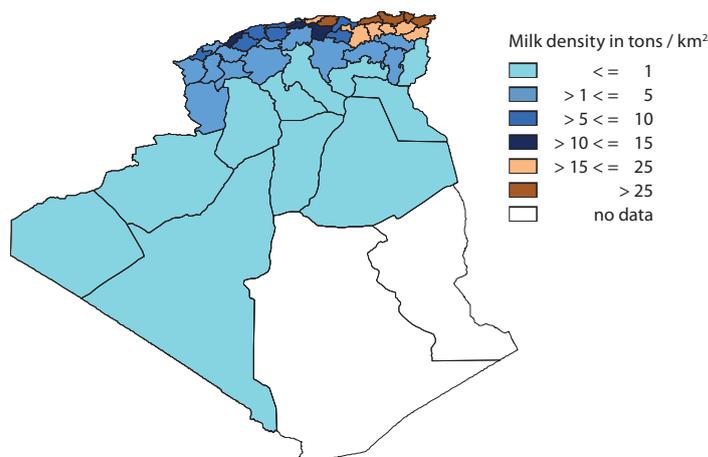
- Milk production (cow's): 1.5 mill t ECM (number 46 in the world)
- No. of dairy farms: 20,000
- Share of milk produced in farms with more than 50 cows: 5%
- Milk price: 52% to world market
- Feed price: 0% to world market

Key developments 2006-2010

- Milk production growth: +0.8% per year
- Share of time milk price was above world market level: 100%
- Milk price was on average 68% above the world market
- Share of time feed price was above world market level: 0%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

Milk density 2009

in tons / km²

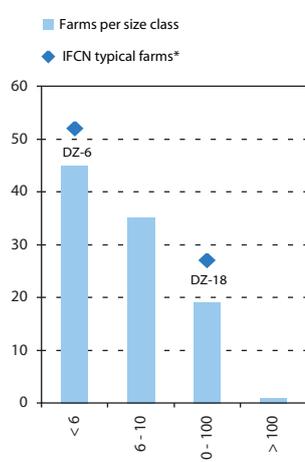


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.87	0.95	1.13	1.10	1.26	1.50	1.45	1.55	4.2%	0.8%
Cows (in 1,000's)	752	740	900	874	1,003	848	854	882	1.1%	1.0%
Milk yield (t/cow/year)	1.2	1.3	1.3	1.3	1.3	1.8	1.7	1.8	3.0%	-0.2%
Farm structure										
No. of dairy farms (in 1,000's)		24	26	25	23	22	21	20		-2.4%
Average farm size (cows/farm)		31	35	35	43	39	41	44		3.4%
Prices in national currency										
Milk : feed price ratio	2.3	3.9	4.4	3.3	3.0	3.6	2.4	2.7	1.4%	-6.4%
Cull cow (DZD / kg live weight)								540		
Land - buy (1,000 DZD / ha)								7,000		

Farm structure

% of dairy farms in size classes (2010)



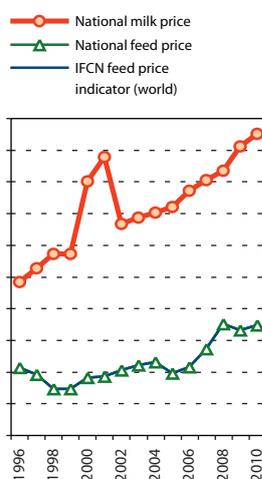
* size class where IFCN typical farms are

The milk price paid on local markets is more attractive for dairy farmers. To stimulate milk delivery to processors government pays a subsidy (included in the milk price the farmer gets; 1,200 DZD / 100 kg milk (2010)).



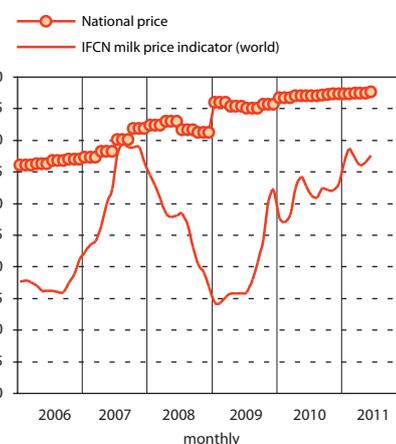
Milk and feed price

1,000 DZD / 100 kg



Farm gate milk prices

1,000 DZD / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, milk production based on cow numbers.

Estimates done for: Dairy farm numbers interpolated for the years 2001-2008.

Remarks: Since no statistical information on soybean meal and corn prices are available the world market prices are used.

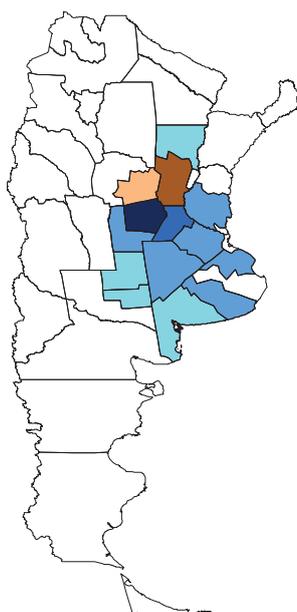
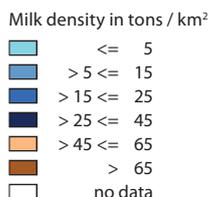
3.13 Argentina – Milk production fact sheet



Hugo Quattrochi



Milk density 2008 in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 10.1 mill t ECM (number 18 in the world)
- No. of dairy farms: 11,167
- Share of milk produced in farms with more than 50 cows: 94% (2008)
- Milk price: -18% to world market
- Feed price: -28% to world market

Key developments 2006-2010

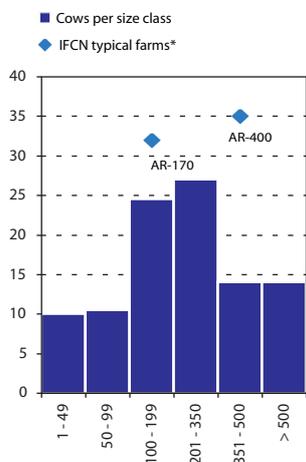
- Milk production growth: +0.3% per year
- Share of time milk price was above world market level: 0%
- Milk price was on average -29% below the world market
- Share of time feed price was above world market level: 0%
- Share of time milk : feed price ratio was above 1.5 (favourable): 60%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	8.26	8.92	9.30	7.89	9.18	9.96	9.83	10.07	1.4%	0.3%
Cows (in 1,000's)	2,000	1,993	2,150	2,005	2,050	2,091	1,841	1,749	-1.0%	-4.4%
Milk yield (t/cow/year)	4.1	4.5	4.3	3.9	4.5	4.8	5.3	5.8	2.4%	4.9%
Farm structure										
No. of dairy farms (in 1,000's)	20.0	18.1	16.5	15.0	14.0	13.4	11.8	11.2	-4.1%	-4.4%
Average farm size (cows/farm)	100	110	130	134	147	156	156	157	3.3%	0.0%
Prices in national currency										
Milk : feed price ratio	1.3	1.7	1.5	0.9	1.4	1.4	1.6	2.0	3.5%	9.3%
Cull cow (ARS / kg live weight)	0.35	0.50	0.39	0.80	1.60	1.70	1.64	4.07	19.2%	24.4%
Land - buy (ARS / ha)	2,255	3,254	2,786	6,299	11,152	16,728	28,513	38,580	22.5%	23.2%

Farm structure

% of dairy farms and cows in size classes (2008)



* size class where IFCN typical farms are

Farm structure

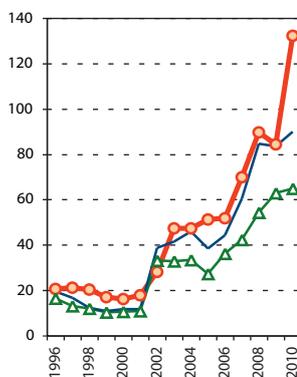
cows per herd size (in 1,000's)



Milk and feed price

ARS / 100 kg

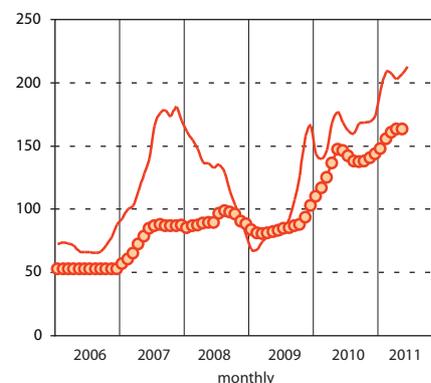
- National milk price
- National feed price
- IFCN feed price indicator (world)



Farm gate milk prices

ARS / 100 kg milk (ECM)

- National price
- IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2008, milk production.

Estimates done for: Milk production 2010.



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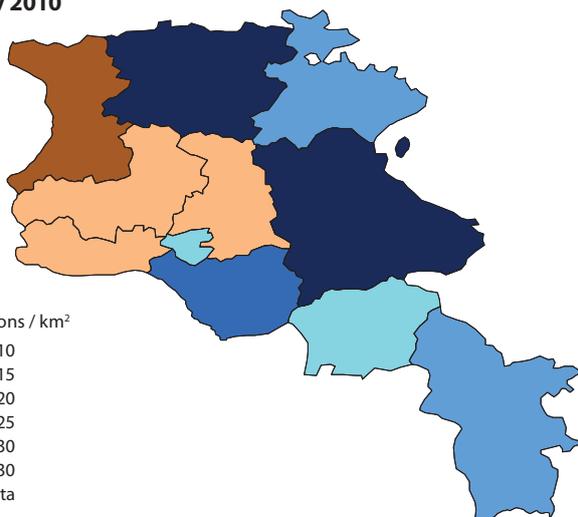


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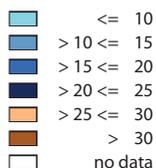


Milk density 2010

in tons / km²



Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 0.6 mill t ECM (number 87 in the world)
- No. of dairy farms: 173,000
- Share of milk produced in farms with more than 50 cows: 28% (2008)
- Milk price: -22% to world market
- Feed price: 43% to world market

Key developments 2006-2010

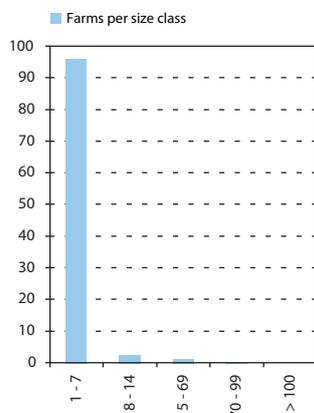
- Milk production growth: -0.1% per year
- Share of time milk price was above world market level: 40%
- Milk price was on average -6% below the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.40	0.42	0.42	0.44	0.52	0.57	0.63	0.57	2.7%	-0.1%
Cows (in 1,000's)	277	256	262	281	290	307	283	272	-0.1%	-3.0%
Milk yield (t/cow/year)	1.4	1.7	1.6	1.6	1.8	1.9	2.2	2.1	2.8%	3.0%
Farm structure										
No. of dairy farms (in 1,000's)	192	195	197	193	202	203	174	173	-0.7%	-3.9%
Average farm size (cows/farm)	1.4	1.3	1.3	1.5	1.4	1.5	1.6	1.6	0.6%	1.0%
Prices in national currency										
Milk : feed price ratio		1.4	1.1	1.4	0.9	1.0	1.2	1.0		-0.6%
Cull cow (AMD / kg live weight)							600	800		
Land - buy (1,000 AMD / ha)						333	306	561		13.9%

Farm structure

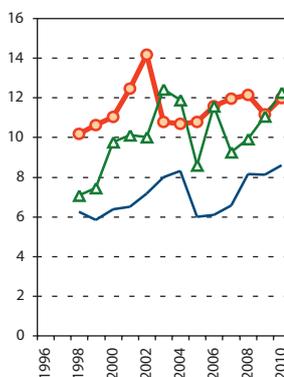
% of dairy farms and cows in size classes (2008)



Milk and feed price

1,000 AMD / 100 kg

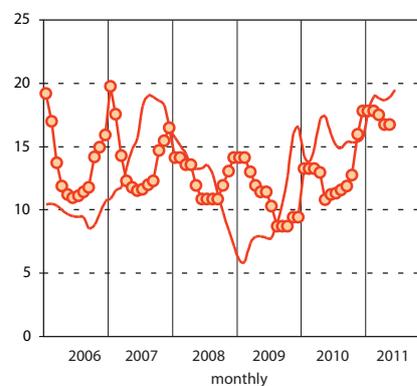
- National milk price (red circles)
- National feed price (green triangles)
- IFCN feed price indicator (world) (blue line)



Farm gate milk prices

1,000 AMD / 100 kg milk (ECM)

- National price (red circles)
- IFCN milk price indicator (world) (blue line)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Since no statistical information on soybean meal prices are available the world market price is used.

Remarks: The land price mentioned is for non-irrigated arable land in Shirak Marz.





Andrew Weinert



STATUS AND KEY DEVELOPMENTS

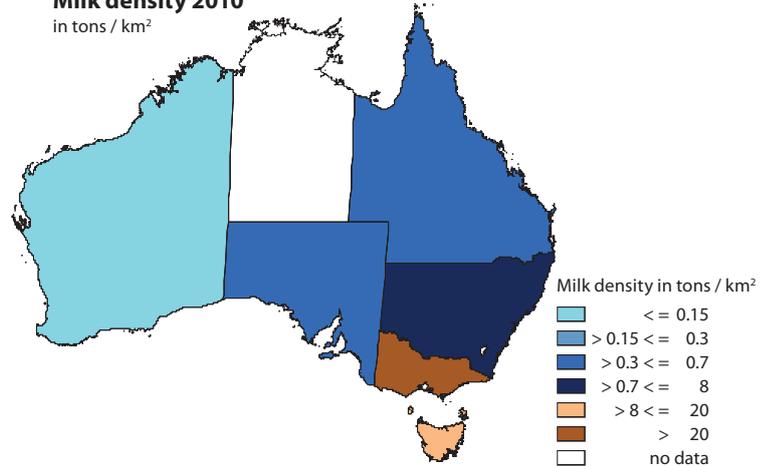
Status 2010

- Milk production (cow's): 9.5 mill t ECM (number 19 in the world)
- No. of dairy farms: 7,511
- Share of milk produced in farms with more than 50 cows: 100%
- Milk price: -14% to world market
- Feed price: -1% to world market

Key developments 2006-2010

- Milk production growth: -1.8% per year
- Share of time milk price was above world market level: 40%
- Milk price was on average -9% below the world market
- Share of time feed price was above world market level: 60%
- Share of time milk : feed price ratio was above 1.5 (favourable): 40%

Milk density 2010
in tons / km²



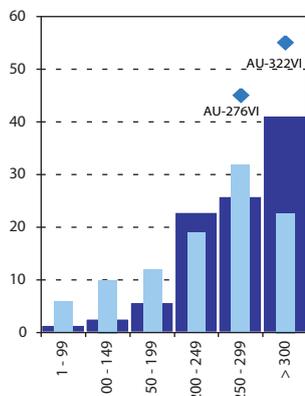
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	9.28	10.29	11.13	11.15	10.55	10.19	9.62	9.46	0.1%	-1.8%
Cows (in 1,000's)	1,884	2,060	2,171	2,123	2,038	1,880	1,641	1,600	-1.2%	-4.0%
Milk yield (t/cow/year)	4.9	5.0	5.1	5.3	5.2	5.4	5.9	5.9	1.3%	2.2%
Farm structure										
No. of dairy farms (in 1,000's)	13.9	13.5	12.9	11.0	9.6	8.8	8.0	7.5	-4.3%	-3.9%
Average farm size (cows/farm)	136	153	168	192	212	214	206	213	3.3%	-0.1%
Prices in national currency										
Milk : feed price ratio	1.2	1.4	1.3	1.2	1.3	1.3	1.2	1.6	1.9%	5.2%
Cull cow (AUD / kg live weight)	1.05	1.15	1.20	1.35	1.50	1.26	1.23	1.32	1.6%	1.2%
Land - buy (AUD / ha)	5,715	6,333	5,765	5,807	7,512	9,812	11,872	12,000	5.4%	5.2%

Farm structure

% of dairy farms and cows in size classes (2008)

- Cows per size class
- Farms per size class
- ◆ IFCN typical farms*

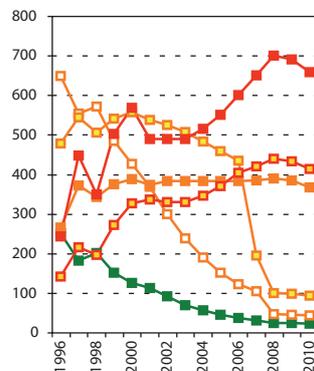


* size class where IFCN typical farms are

Farm structure

cows per herd size (in 1,000's)

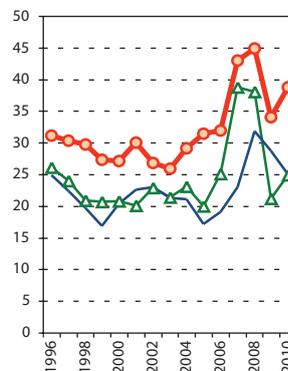
- 1 - 99
- 100 - 149
- 150 - 199
- 200 - 249
- 250 - 299
- > 300



Milk and feed price

AUD / 100 kg

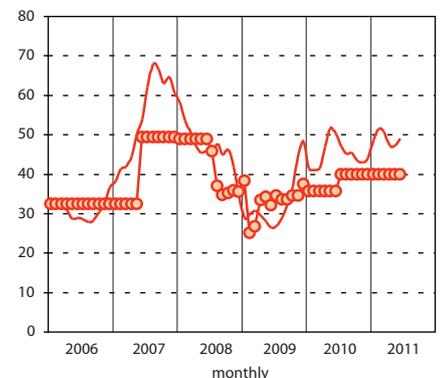
- National milk price
- △ National feed price
- IFCN feed price indicator (world)



Farm gate milk prices

AUD / 100 kg milk (ECM)

- National price
- IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Land price 2009-2010. Farm structure: Cow number 2009-2010.

Remarks: Annualised production and price data is shown.



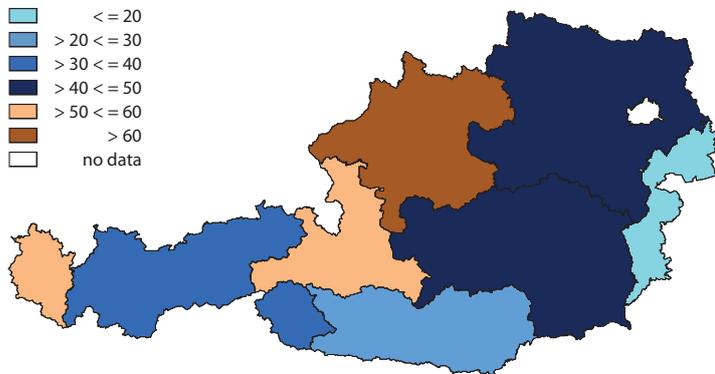
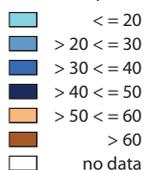
Leopold Kirner



Milk density 2010

in tons / km²

Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 3.4 mill t ECM (number 35 in the world)
- No. of dairy farms: 40,000
- Share of milk produced in farms with more than 50 cows: 7%
- Milk price: -1% to world market
- Feed price: 16% to world market

Key developments 2006-2010

- Milk production growth: +0.8% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average 23% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

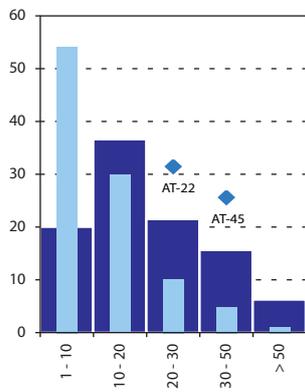
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	3.00	3.10	3.31	3.39	3.24	3.25	3.30	3.36	0.8%	0.8%
Cows (in 1,000's)	698	729	621	589	538	527	530	530	-1.9%	0.1%
Milk yield (t/cow/year)	4.3	4.3	5.3	5.8	6.0	6.2	6.2	6.3	2.8%	0.7%
Farm structure										
No. of dairy farms (in 1,000's)	90	87	67	60	55	48	44	40	-5.6%	-4.5%
Average farm size (cows/farm)	8	8	9	10	10	11	12	13	3.9%	4.8%
Prices in national currency										
Milk : feed price ratio	1.5	2.0	1.8	2.1	2.6	1.9	1.5	1.5	0.2%	-5.5%
Cull cow (EUR / kg live weight)	0.98	0.93	0.94	0.79	0.87	1.10	1.30	1.10	0.8%	0.0%
Land - buy (EUR / ha)			14,915	14,938	16,351	18,000	20,000	25,000		8.6%
Quota (EUR / kg milk)			0.88	0.80	0.90	0.80	0.40	0.20		-2.9%

Farm structure

% of dairy farms and cows in size classes (2009)

- Cows per size class
- Farms per size class
- ◆ IFCN typical farms*

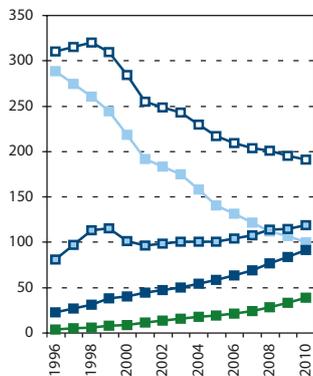


* size class where IFCN typical farms are

Farm structure

cows per herd size (in 1,000's)

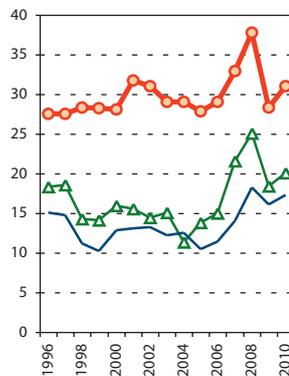
- 1 - 10
- > 10 - 20
- > 20 - 30
- > 30 - 50
- > 50



Milk and feed price

EUR / 100 kg

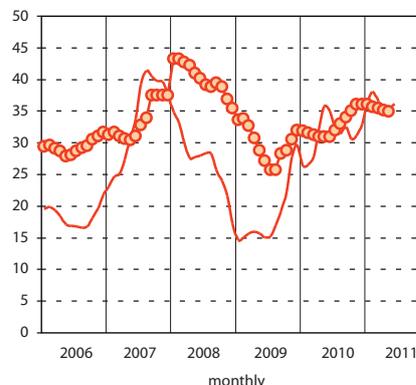
- National milk price
- △ National feed price
- IFCN feed price indicator (world)



Farm gate milk prices

EUR / 100 kg milk (ECM)

- National price
- IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Farm structure: Cow number 2010 following the trend. Soybean meal and barley price 2010.

Remarks: Land and quota prices are taken from typical farms (Mühlviertel).



STATUS AND KEY DEVELOPMENTS

Status 2010

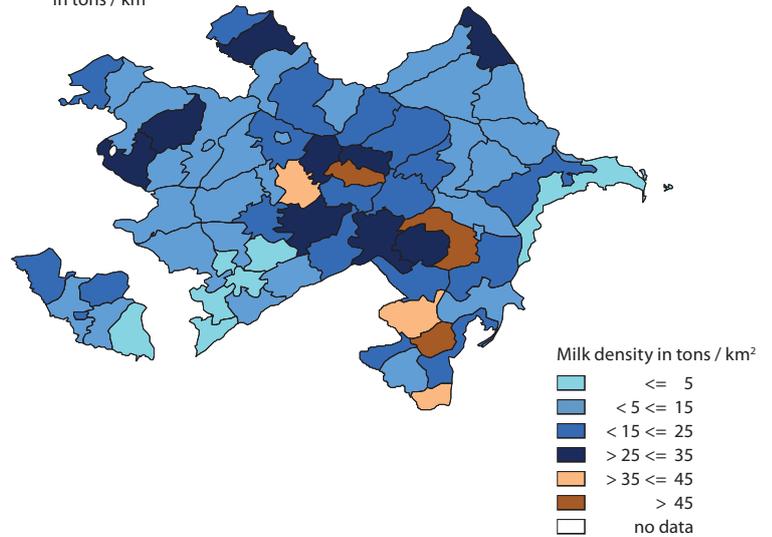
- Milk production (cow's and buffalo's): 1.5 mill t ECM (number 64 in the world)
- Milk price: 21% to world market
- Feed price: 0% to world market

Key developments 2006-2010

- Milk production growth: +3.5% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 7% above the world market
- Share of time feed price was above world market level: 0%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

Milk density 2010

in tons / km²



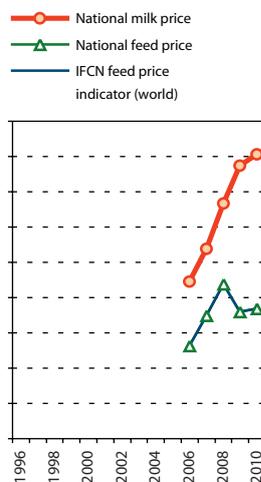
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's and buffalo's)										
Production (mill t)	0.83	0.93	1.01	1.10	1.19	1.27	1.35	1.46	4.1%	3.5%
Cows and buffalos (in 1,000's)	773	863	926	1,002	1,076	1,151	1,217	1,264	3.6%	2.4%
Milk yield (t/cow/year)	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	0.5%	1.1%
Farm structure										
No. of dairy farms (in 1,000's)	515	575	617	667	717	767	811	842	3.6%	2.4%
Average farm size (cows/farm)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0.0%	0.0%
Prices in national currency										
Milk : feed price ratio	1.6	3.7	4.2	2.4	2.9	2.8	2.7	4.3	7.3%	10.8%
Cull cow (AZN / kg live weight)										
Land - buy (AZN / ha)										



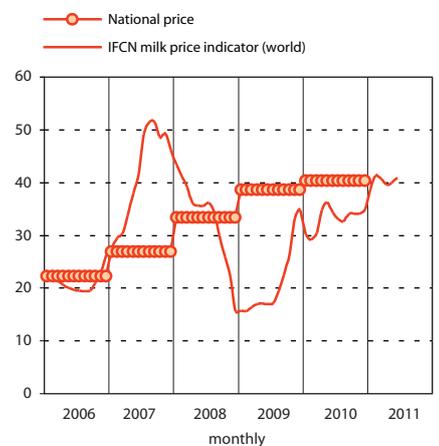
Milk and feed price

AZN / 100 kg



Farm gate milk prices

AZN / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Milk production 2010. Monthly milk price: annual averages. Estimated dairy farm number via farm size assumption (1.5 cows/buffalo per farm).

Remarks: Since no statistical information on soybean meal and corn prices are available the world market price is used.

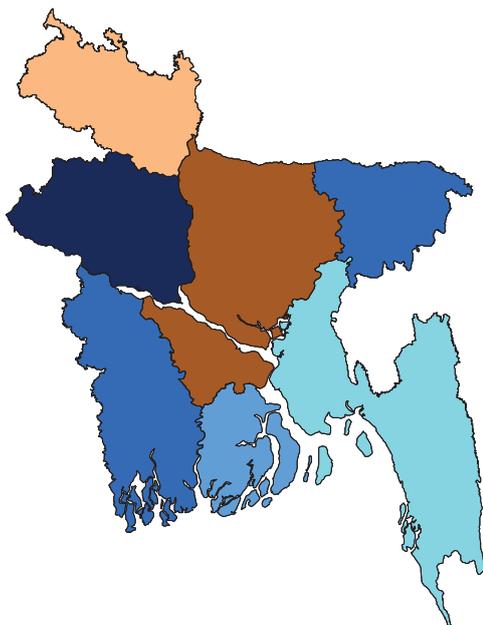
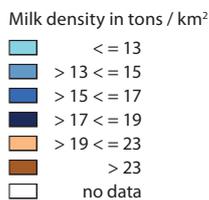


Mohammad Uddin



Milk density 2010

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's and buffalo's): 3 mill t ECM (number 30 in the world)
- No. of dairy farms: 1,387,000
- Share of milk produced in farms with more than 25 cows: 5% (2008)
- Milk price: -20% to world market
- Feed price: 35% to world market

Key developments 2006-2010

- Milk production growth: +4.2% per year
- Share of time milk price was above world market level: 40%
- Milk price was on average -13% below the world market
- Share of time feed price was above world market level: 80%
- Share of time milk : feed price ratio was above 1.5 (favourable): 40%

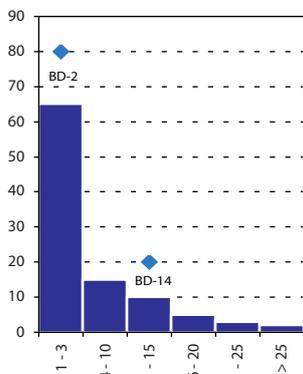
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's and buffalo's)										
Production (mill t)	1.91	1.87	1.94	1.97	2.20	2.51	2.93	2.97	3.2%	4.2%
Cows and buffalos (in 1,000's)	3,995	4,022	4,061	4,100	4,140	4,180	4,204	4,273	0.5%	0.5%
Milk yield (t/cow/year)	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.7	2.7%	3.7%
Farm structure										
No. of dairy farms (in 1,000's)	1,332	1,341	1,354	1,367	1,380	1,393	1,401	1,387	0.3%	-0.1%
Average farm size (cows/farm)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.1	0.2%	0.7%
Prices in national currency										
Milk : feed price ratio	1.0	1.4	1.7	1.7	1.5	1.5	1.4	1.1	0.2%	-8.5%
Cull cow (BDT / kg live weight)	50	52	54	54	56	62	68	100	5.1%	12.7%
Land - buy (1,000 BDT / ha)	741	865	988	1,112	1,235	1,325	1,500	1,750	6.3%	7.2%

Farm structure

% of dairy farms and cows in size classes (2008)

■ Cows per size class
◆ IFCN typical farms*

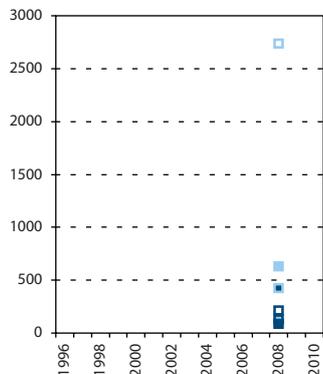


* size class where IFCN typical farms are

Farm structure

cows per herd size (in 1,000's)

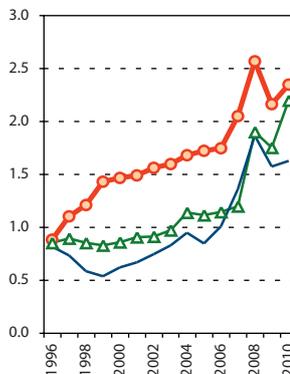
□ 1 - 3 □ 4 - 10
■ 11 - 15 ■ 16 - 20
■ 21 - 25 ■ > 25



Milk and feed price

1,000 BDT / 100 kg

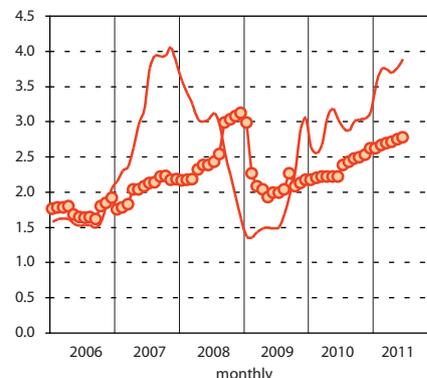
○ National milk price
△ National feed price
— IFCN feed price indicator (world)



Farm gate milk prices

1,000 BDT / 100 kg milk (ECM)

○ National price
— IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Buffalo numbers 2009-2010. Dairy farm numbers 1996-2009 based on average farm size.





3.19 Belarus – Milk production fact sheet



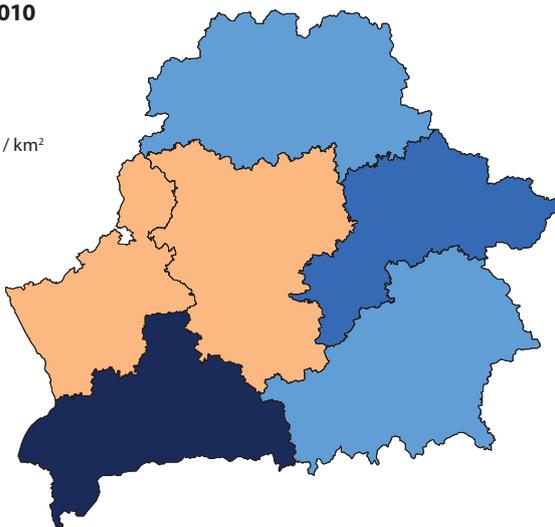
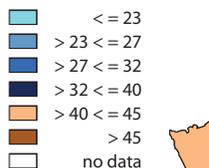
Anatoli Takun



Milk density 2010

in tons / km²

Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 6.2 mill t ECM (number 26 in the world)
- No. of dairy farms: 66,109
- Share of milk produced in farms with more than 200 cows: 86%
- Milk price: -31% to world market
- Feed price: -37% to world market

Key developments 2006-2010

- Milk production growth: +3.5% per year
- Share of time milk price was above world market level: 0%
- Milk price was on average -27% below the world market
- Share of time feed price was above world market level: 0%
- Share of time milk : feed price ratio was above 1.5 (favourable): 80%

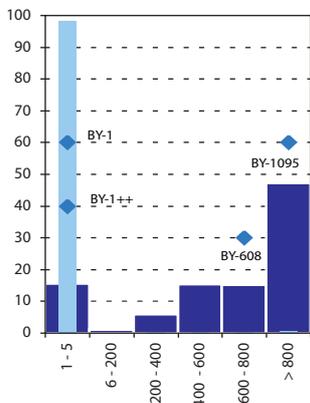
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	4.51	4.81	4.12	4.38	4.73	5.42	5.83	6.21	2.3%	3.5%
Cows (in 1,000's)	2,043	1,946	1,845	1,716	1,613	1,506	1,452	1,478	-2.3%	-0.5%
Milk yield (t/cow/year)	2.2	2.5	2.2	2.6	2.9	3.6	4.0	4.2	4.7%	4.0%
Farm structure										
No. of dairy farms (in 1,000's)			215	187	153	122	86	66		-14.1%
Average farm size (cows/farm)			9	9	11	12	17	22		15.9%
Prices in national currency										
Milk : feed price ratio			0.8	1.2	1.2	1.5	1.5	1.4		-2.0%
Cull cow (BYR / kg live weight)			363	1,035	1,507	2,150	3,000	3,560		-6.2%
Land - buy (1,000 BYR / ha)										13.4%

Farm structure

% of dairy farms and cows in size classes (2009)

- Cows per size class
- Farms per size class
- ◆ IFCN typical farms*

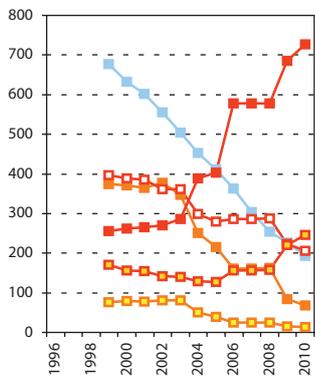


* size class where IFCN typical farms are

Farm structure

cows per herd size (in 1,000's)

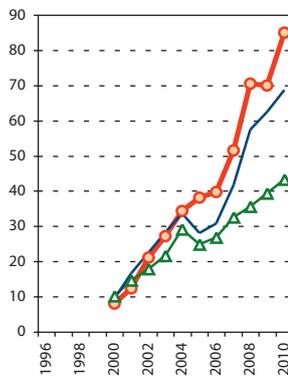
- 1 - 5
- 6 - 200
- 200 - 400
- 400 - 600
- 600 - 800
- > 800



Milk and feed price

1,000 BYR / 100 kg

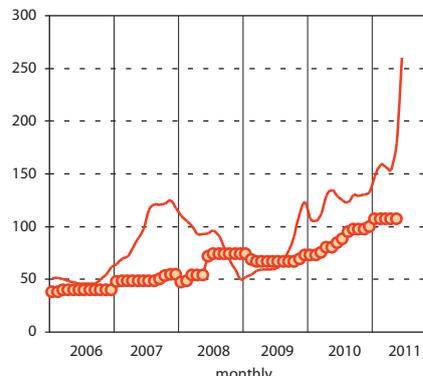
- National milk price
- △ National feed price
- IFCN feed price indicator (world)



Farm gate milk prices

1,000 BYR / 100 kg milk (ECM)

- National price
- IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Farm structure: Cow number 2010 following the trend. Trend of world soybean meal price is used for the years 1996-2007.





STATUS AND KEY DEVELOPMENTS

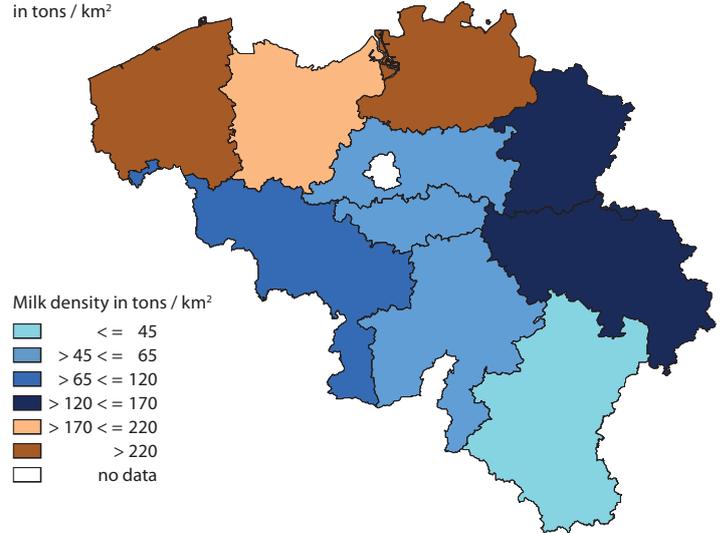
Status 2010

- Milk production (cow's): 3.2 mill t ECM (number 38 in the world)
- No. of dairy farms: 11,398
- Share of milk produced in farms with more than 50 cows: 59%
- Milk price: 1% to world market
- Feed price: 58% to world market

Key developments 2006-2010

- Milk production growth: +1.7% per year
- Share of time milk price was above world market level: 100%
- Milk price was on average 18% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 20%

Milk density 2009

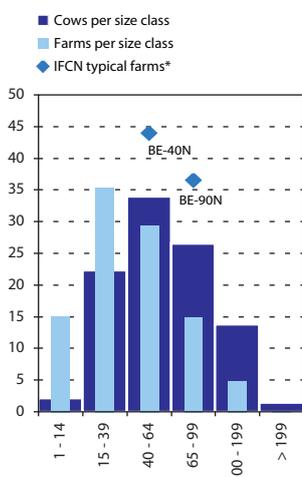
 in tons / km²


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	3.48	3.45	3.48	3.19	3.16	2.96	2.94	3.16	-0.7%	1.7%
Cows (in 1,000's)	650	632	594	577	543	507	495	500	-1.9%	-0.4%
Milk yield (t/cow/year)	5.4	5.5	5.9	5.5	5.8	5.8	5.9	6.3	1.2%	2.0%
Farm structure										
No. of dairy farms (in 1,000's)	20.7	19.1	17.6	17.2	15.8	14.3	12.7	11.4	-4.2%	-5.5%
Average farm size (cows/farm)	31	33	34	34	34	35	39	44	2.4%	5.5%
Prices in national currency										
Milk : feed price ratio	1.5	1.7	1.6	1.6	1.4	1.5	1.2	1.2	-1.8%	-6.4%
Cull cow (EUR / kg live weight)	0.45	0.52	0.60	0.70	0.65	1.21	1.29	0.98	5.7%	-5.1%
Land - buy (EUR / ha)	12,175	18,819	21,069	16,795	23,155	27,190	29,000	30,000	6.7%	2.5%
Quota (EUR / kg milk)	0.43	0.39	0.38	0.39	0.39	0.39	0.33	0.12	-8.7%	-25.5%

Farm structure

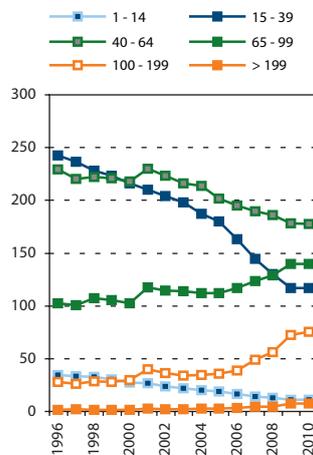
% of dairy farms and cows in size classes (2009)



* size class where IFCN typical farms are

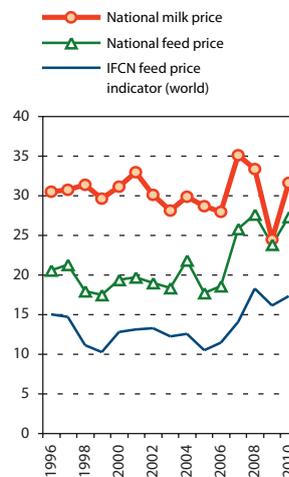
Farm structure

cows per herd size (in 1,000's)



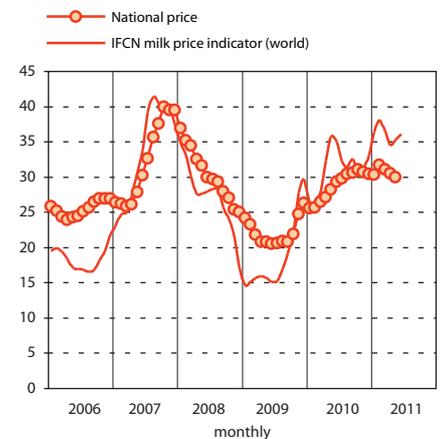
Milk and feed price

EUR / 100 kg



Farm gate milk prices

EUR / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, milk production.

Estimates done for: Soybean meal and barley price 2010. Farm structure 2010 based on total numbers.

3.21 Bolivia – Milk production fact sheet



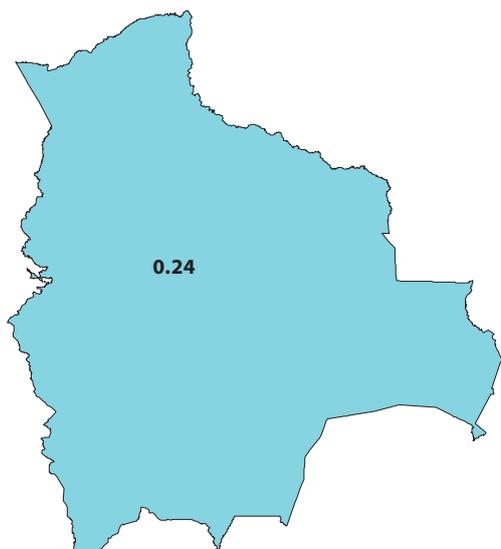
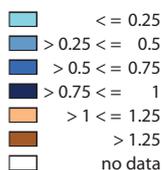
Felix Menzel

Dairy Farmer

Milk density 2010

in tons / km²

Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 0.3 mill t ECM (number 98 in the world)
- No. of dairy farms: 8,800
- Milk price: 6% to world market
- Feed price: 0% to world market

Key developments 2006-2010

- Milk production growth: +0.7% per year
- Share of time milk price was above world market level: 40%
- Milk price was on average -15% below the world market
- Share of time feed price was above world market level: 0%
- Share of time milk : feed price ratio was above 1.5 (favourable): 20%

Key variables

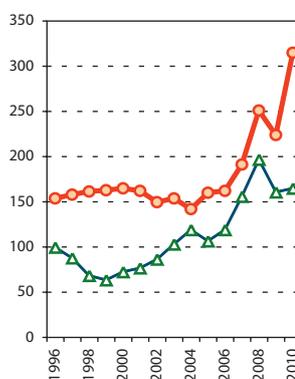
	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.20	0.19	0.23	0.29	0.31	0.25	0.26	0.26	2.1%	0.7%
Cows (in 1,000's)	140	146	137	182	190	198	198	198	2.5%	0.0%
Milk yield (t/cow/year)	1.4	1.3	1.7	1.6	1.6	1.3	1.3	1.3	-0.4%	0.7%
Farm structure										
No. of dairy farms (in 1,000's)	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	0.0%	0.0%
Average farm size (cows/farm)	16	17	16	21	22	23	23	23	2.5%	0.0%
Prices in national currency										
Milk : feed price ratio	1.5	2.4	2.3	1.7	1.2	1.4	1.3	1.4	-0.5%	1.4%
Cull cow (BOB / kg live weight)							9.00	8.00		
Land - buy (BOB / ha)							11,000	14,324		



Milk and feed price

BOB / 100 kg

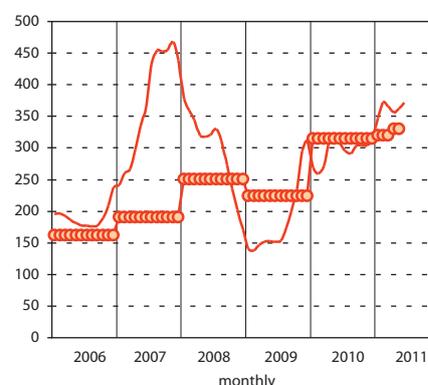
- National milk price
- National feed price
- IFCN feed price indicator (world)



Farm gate milk prices

BOB / 100 kg milk (ECM)

- National price
- IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Milk production 2009-2010. Cow numbers 2006-2010 left constant. Dairy farm numbers estimated based on average farm size.

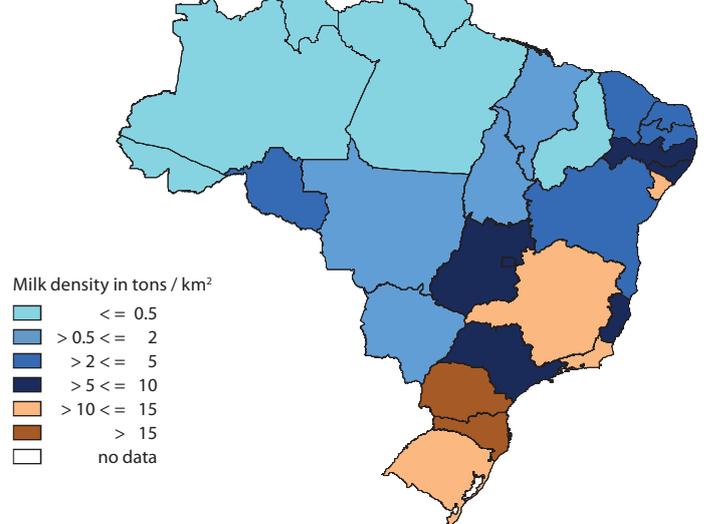
Remarks: Since no statistical information on soybean meal and corn prices are available the world market price is used.


STATUS AND KEY DEVELOPMENTS
Status 2010

- Milk production (cow's): 30.8 mill t ECM (number 5 in the world)
- No. of dairy farms: 1,167,021
- Share of milk produced in farms with more than 50 cows: 36%
- Milk price: -4% to world market
- Feed price: 8% to world market

Key developments 2006-2010

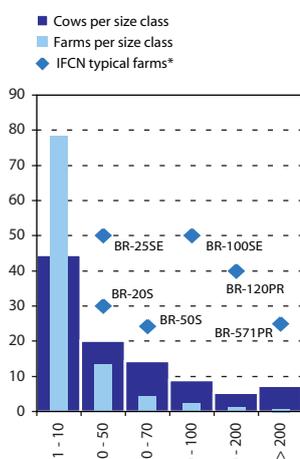
- Milk production growth: +4.9% per year
- Share of time milk price was above world market level: 20%
- Milk price was on average -9% below the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 20%

Milk density 2010
in tons / km²

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	18,55	18,73	19,80	21,68	23,51	25,44	27,63	30,76	3.7%	4.9%
Cows (in 1,000's)	16,274	17,281	17,885	18,793	20,023	20,943	21,585	22,999	2.5%	2.4%
Milk yield (t/cow/year)	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.1%	2.4%
Farm structure										
No. of dairy farms (in 1,000's)	1,810	1,716	1,622	1,529	1,435	1,341	1,252	1,167	-3.1%	-3.4%
Average farm size (cows/farm)	9	10	11	12	14	16	17	20	5.8%	6.0%
Prices in national currency										
Milk : feed price ratio	1.3	1.3	1.1	0.9	1.1	1.3	1.3	1.6	1.8%	4.6%
Cull cow (BRL / kg live weight)	0.71	0.76	0.70	1.63	1.96	1.72	2.74	2.87	10.5%	13.7%
Land - buy (BRL / ha)	1,293	1,282	1,621	2,559	4,361	5,030	6,177	7,490	13.4%	10.5%

Farm structure

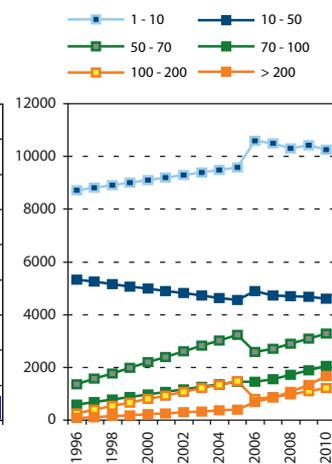
% of dairy farms and cows in size classes (2010)



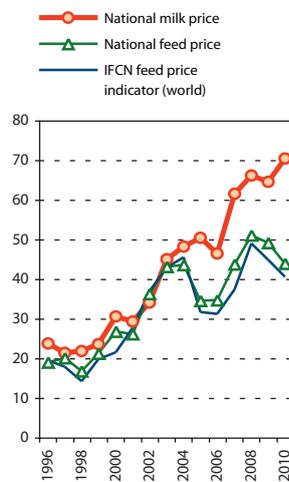
* size class where IFCN typical farms are

Farm structure

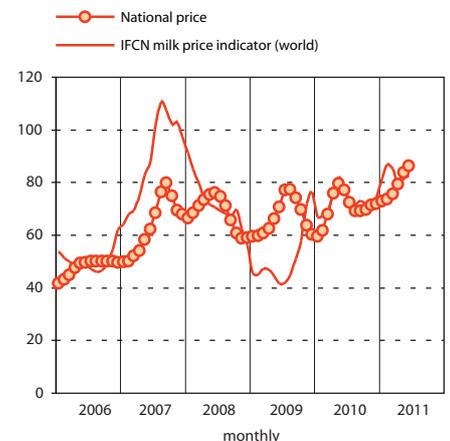
cows per herd size (in 1,000's)


Milk and feed price

BRL / 100 kg


Farm gate milk prices

BRL / 100 kg milk (ECM)


Explanations
Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Farm structure based on 1996 and 2006 census.

Remarks: Land prices for São Paulo State.

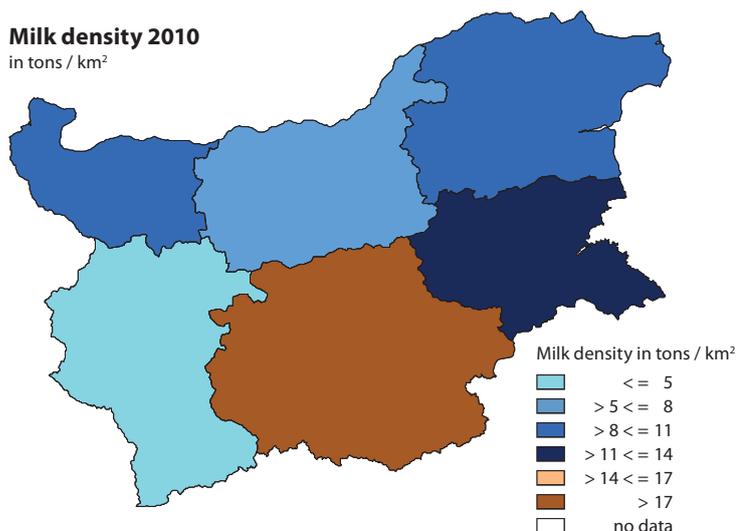


Zlatan D. Vassilev

Dairy Expert

Milk density 2010

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's and buffalo's): 0.9 mill t ECM (number 68 in the world)
- No. of dairy farms: 74,660
- Share of milk produced in farms with more than 15 cows: 49%
- Milk price: 1% to world market
- Feed price: 27% to world market

Key developments 2006-2010

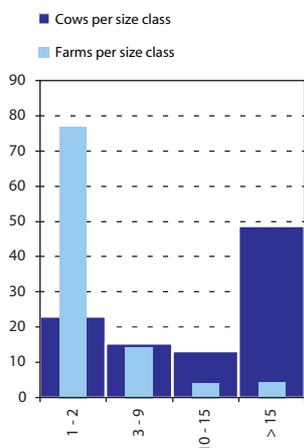
- Milk production growth: -6.3% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 8% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 40%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's and buffalo's)										
Production (mill t)	1.09	1.27	1.31	1.21	1.24	1.20	1.06	0.93	-1.1%	-6.3%
Cows and buffalos (in 1,000's)	369	434	321	384	383	355	320	313	-1.2%	-3.1%
Milk yield (t/cow/year)	2.9	2.9	4.1	3.1	3.2	3.4	3.3	3.0	0.1%	-3.3%
Farm structure										
No. of dairy farms (in 1,000's)			200	195	175	123	106	75		-11.7%
Average farm size (cows/farm)			1.6	2.0	2.2	2.9	3.0	4.2		9.8%
Prices in national currency										
Milk : feed price ratio			1.8	1.6	1.3	2.0	1.3	1.4		-7.8%
Cull cow (BGN / kg live weight)			1.06	1.26	1.13	1.27	1.48	1.70		7.6%
Land - buy (BGN / ha)		1,400	1,370	1,410	1,340	1,700	3,000	3,500		19.8%
Quota (BGN / kg milk)								0.10		

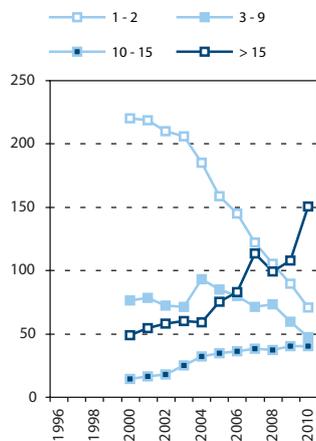
Farm structure

% of dairy farms and cows in size classes (2010)



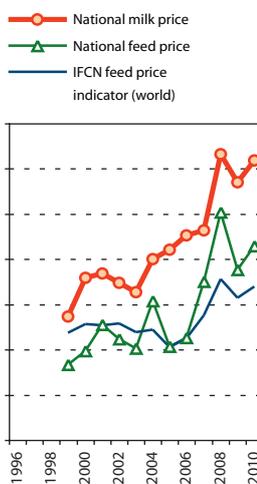
Farm structure

cows per herd size (in 1,000's)



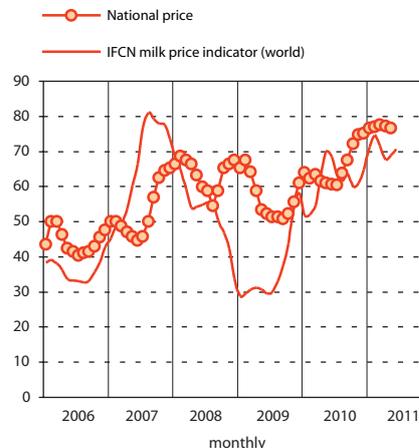
Milk and feed price

BGN / 100 kg



Farm gate milk prices

BGN / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Milk production 2010. Barley price 2009-2010. Cull cow price 2009-2010. Quota price 2010.

Remarks: Since no statistical information on soybean meal prices are available the world market price is used 2001-2010.





STATUS AND KEY DEVELOPMENTS

Status 2010

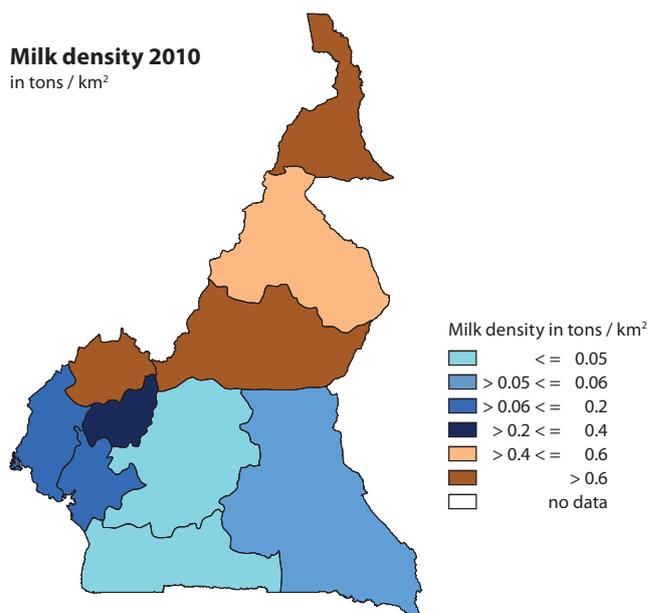
- Milk production (cow's): 0.1 mill t ECM (number 113 in the world)
- No. of dairy farms: 4,030
- Share of milk produced in farms with more than 50 cows: 83%
- Milk price: 38% to world market
- Feed price: 142% to world market

Key developments 2006-2010

- Milk production growth: 0% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 47% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

Milk density 2010

in tons / km²

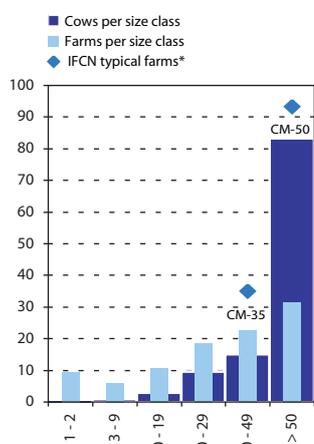


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.13	0.13	0.14	0.13	0.14	0.14	0.14	0.14	0.6%	0.0%
Cows (in 1,000's)	250	250	260	255	265	270	270	270	0.6%	0.0%
Milk yield (t/cow/year)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0%	0.0%
Farm structure										
No. of dairy farms (in 1,000's)	3.7	3.7	3.8	3.8	3.9	4.0	4.0	4.0	0.6%	0.2%
Average farm size (cows/farm)	67	67	69	67	68	68	67	67	0.0%	-0.2%
Prices in national currency										
Milk : feed price ratio	1.7	1.6	1.2	1.2	1.1	0.8	0.8	1.0	-3.6%	5.2%
Cull cow (XAF / kg live weight)	300	300	300	350	350	475	550	650	5.7%	8.2%
Land - buy (1,000 XAF / ha)	700	700	750	750	800	1,000	1,300	1,400	5.1%	8.8%

Farm structure

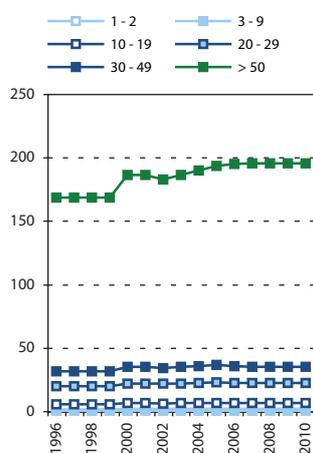
% of dairy farms and cows in size classes (2010)



* size class where IFCN typical farms are

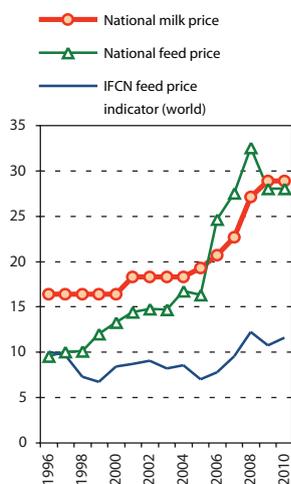
Farm structure

cows per herd size (in 1,000's)



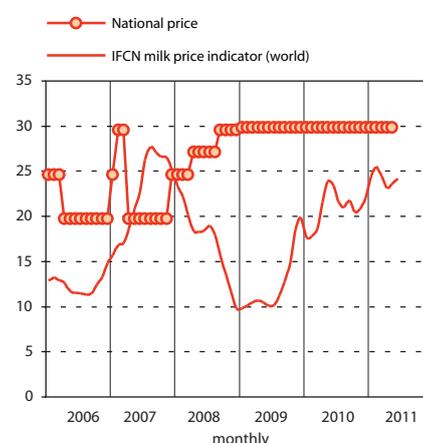
Milk and feed price

1,000 XAF / 100 kg



Farm gate milk prices

1,000 XAF / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Cull cow prices, land prices and farm structure are estimated based on national surveys and expert knowledge.

Remarks: Milk prices represent a price of milk sold at farm gate in Western Highlands. Feed industries mainly import feed components before (mixing and) retailing to farmers.

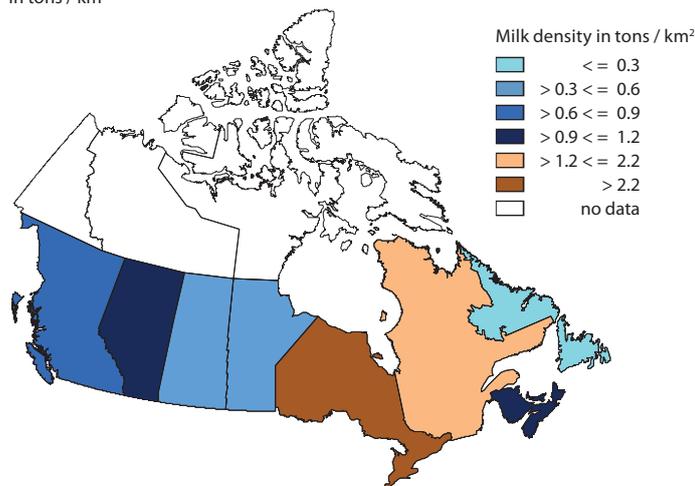


Steve Couture,
Kristin Benke



Milk density 2010

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 8.6 mill t ECM (number 20 in the world)
- No. of dairy farms: 12,965
- Share of milk produced in farms with more than 47 cows: 83%
- Milk price: 80% to world market
- Feed price: -12% to world market

Key developments 2006-2010

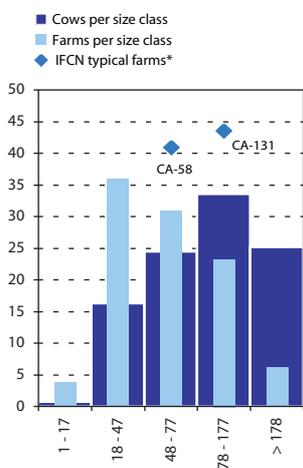
- Milk production growth: +1.2% per year
- Share of time milk price was above world market level: 100%
- Milk price was on average 95% above the world market
- Share of time feed price was above world market level: 20%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	7.68	7.83	8.03	7.94	8.39	8.24	8.59	8.65	0.9%	1.2%
Cows (in 1,000's)	1,237	1,184	1,103	1,084	1,057	1,019	989	981	-1.6%	-0.9%
Milk yield (t/cow/year)	6.2	6.6	7.3	7.3	7.9	8.1	8.7	8.8	2.5%	2.2%
Farm structure										
No. of dairy farms (in 1,000's)	25	22	19	18	16	15	14	13	-4.5%	-3.0%
Average farm size (cows/farm)	50	55	57	60	65	70	73	76	3.0%	2.1%
Prices in national currency										
Milk : feed price ratio	2.1	2.8	3.4	2.9	2.9	3.8	3.2	3.7	4.3%	-0.6%
Cull cow (CAD / kg live weight)			1.25	1.21	0.43	0.63	0.83	0.89		9.2%
Land - buy (CAD / ha)	4,010	5,146	5,679	6,365	7,336	8,142	9,394	10,315	7.0%	6.1%
Quota (CAD / kg milk)	1.11	1.45	2.08	2.37	2.71	3.12	2.94	2.86	7.0%	-2.1%

Farm structure

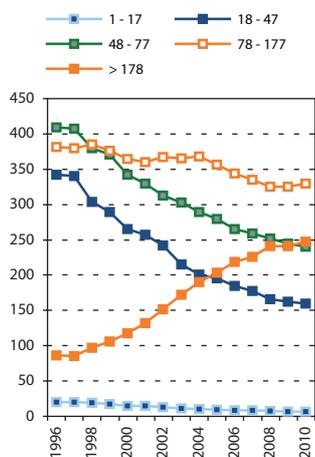
% of dairy farms and cows in size classes (2010)



* size class where IFCN typical farms are

Farm structure

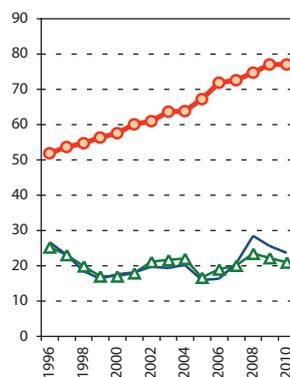
cows per herd size (in 1,000's)



Milk and feed price

CAD / 100 kg

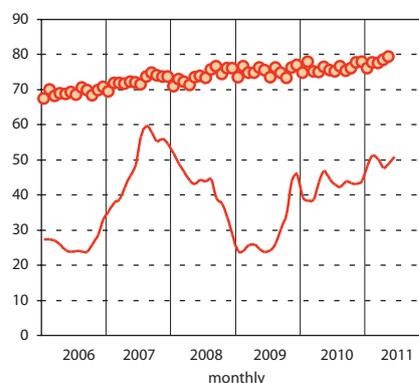
—○— National milk price
—△— National feed price
—□— IFCN feed price indicator (world)



Farm gate milk prices

CAD / 100 kg milk (ECM)

—○— National price
—□— IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Remarks: Farm structure information: The Ontario distribution is used as trend for the whole country.



Mario E. Olivares



STATUS AND KEY DEVELOPMENTS

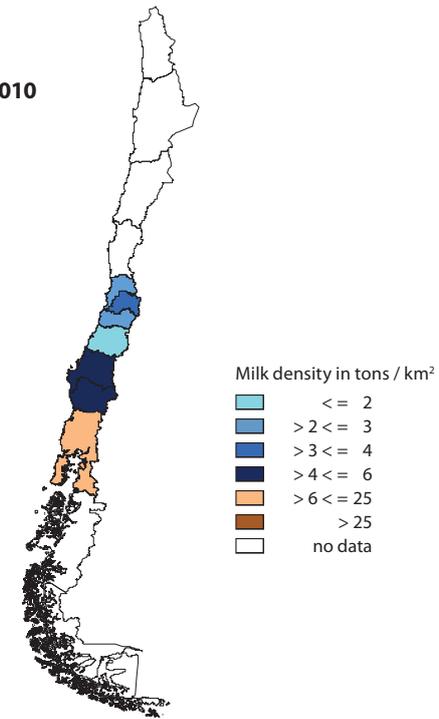
Status 2010

- Milk production (cow's): 2.4 mill t ECM (number 44 in the world)
- No. of dairy farms: 15,903
- Share of milk produced in farms with more than 50 cows: 90%
- Milk price: -19% to world market
- Feed price: 28% to world market

Key developments 2006-2010

- Milk production growth: +1% per year
- Share of time milk price was above world market level: 20%
- Milk price was on average -12% below the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

Milk density 2010
in tons / km²

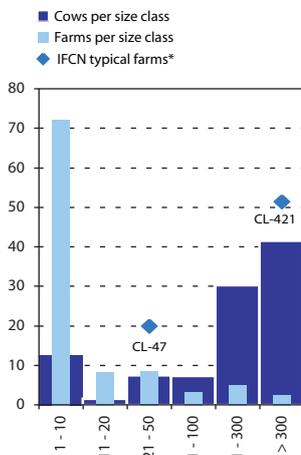


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	1.83	1.98	1.93	2.10	2.15	2.33	2.51	2.42	2.0%	1.0%
Cows (in 1,000's)	605	605	624	628	601	534	459	423	-2.5%	-5.6%
Milk yield (t/cow/year)	3.0	3.3	3.1	3.3	3.6	4.4	5.5	5.7	4.6%	7.0%
Farm structure										
No. of dairy farms (in 1,000's)	49	46	40	34	29	23	19	16	-7.8%	-8.5%
Average farm size (cows/farm)	12	13	15	18	21	24	24	27	5.7%	3.1%
Prices in national currency										
Milk : feed price ratio	0.9	1.0	1.2	0.9	1.0	1.2	1.1	1.1	1.5%	-1.9%
Cull cow (CLP / kg live weight)	274	332	313	349	336	350	470	552	5.1%	12.1%
Land - buy (1,000 CLP / ha)	1,273	1,489	1,303	1,590	2,233	2,300	4,000	5,500	11.0%	24.4%

Farm structure

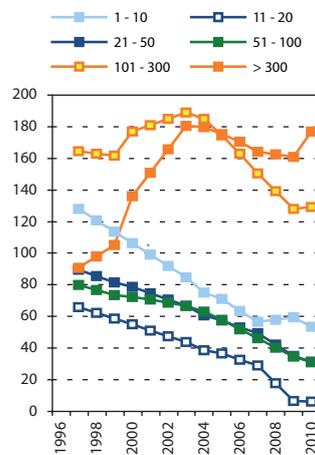
% of dairy farms and cows in size classes (2010)



* size class where IFCN typical farms are

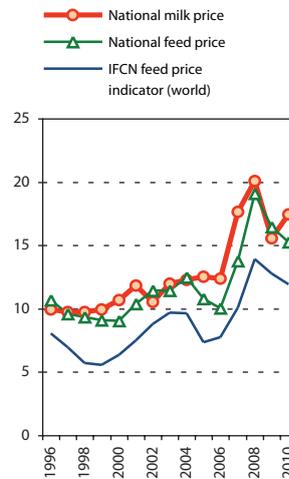
Farm structure

cows per herd size (in 1,000's)



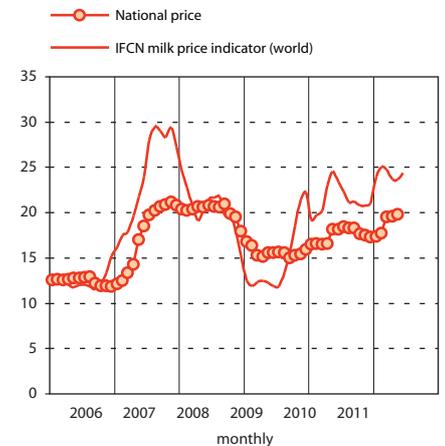
Milk and feed price

1,000 CLP / 100 kg



Farm gate milk prices

1,000 CLP / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Farm structure 1998-2006 and 2008-2010 based on 1997 and 2007 census.

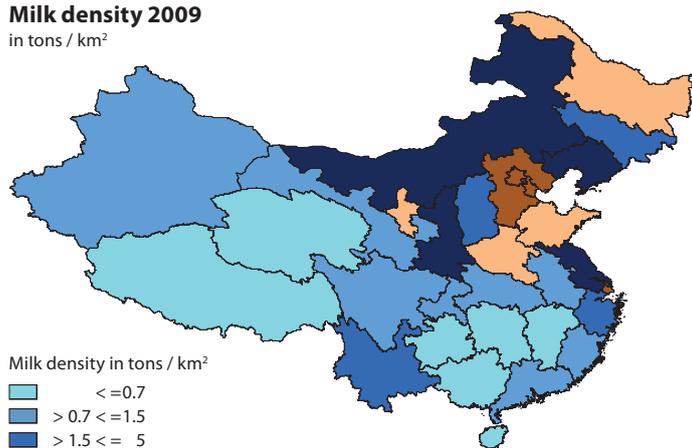


Sam Shi

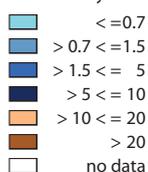


Milk density 2009

in tons / km²



Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 31.8 mill t ECM (number 4 in the world)
- No. of dairy farms: 2,232,500
- Share of milk produced in farms with more than 100 cows: 33%
- Milk price: 15% to world market
- Feed price: 60% to world market

Key developments 2006-2010

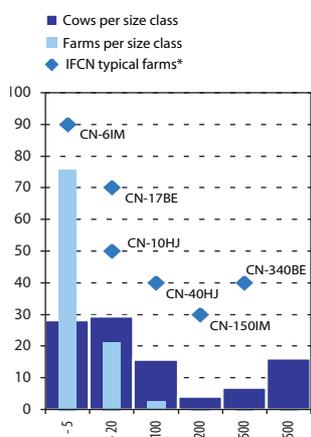
- Milk production growth: +2.8% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 6% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	5.61	5.90	7.37	11.58	20.13	28.44	31.67	31.79	13.2%	2.8%
Cows (in 1,000's)	2,414	2,303	2,639	3,713	5,983	5,772	6,661	6,750	7.6%	4.0%
Milk yield (t/cow/year)	2.3	2.6	2.8	3.1	3.4	4.9	4.8	4.7	5.2%	-1.1%
Farm structure										
No. of dairy farms (in 1,000's)	370	373	404	1,369	2,068	2,406	2,522	2,233	13.7%	-1.9%
Average farm size (cows/farm)	19.3	19.6	19.4	6.6	5.4	4.6	4.8	5.5	-8.6%	4.3%
Prices in national currency										
Milk : feed price ratio	0.9	1.1	1.4	1.4	1.1	1.2	1.3	1.3	2.5%	2.3%
Cull cow (CNY / kg live weight)			5.80	6.49	7.57	8.34	15.14	15.67		17.1%
Land - buy (CNY / ha)			359,280	427,600	470,967	510,876	566,552	634,801		5.6%

Farm structure

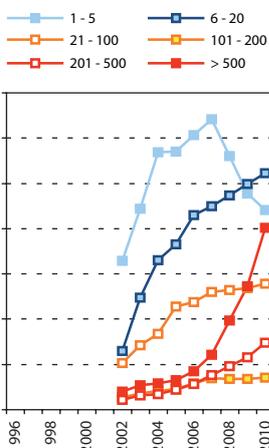
% of dairy farms and cows in size classes (2009)



* size class where IFCN typical farms are

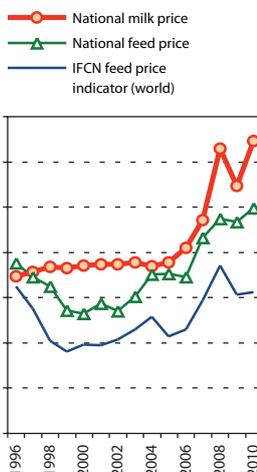
Farm structure

cows per herd size (in 1,000's)



Milk and feed price

CNY / 100 kg



Farm gate milk prices

CNY / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, milk production.

Estimates done for: Farm structure: Cow number 2010 following the trend. Land prices 2007-2010.

Remarks: The table shows cows' milk only. China has about 3 mill t buffalo milk (ECM) and about 5.48 mill buffalos (Source: FAO, 2009).

The farm structure information shows a higher cow number compared to the figures shown in the table (due to different methods used).





René A. Pérez R.



3.28 Colombia – Milk production fact sheet

STATUS AND KEY DEVELOPMENTS

Status 2010

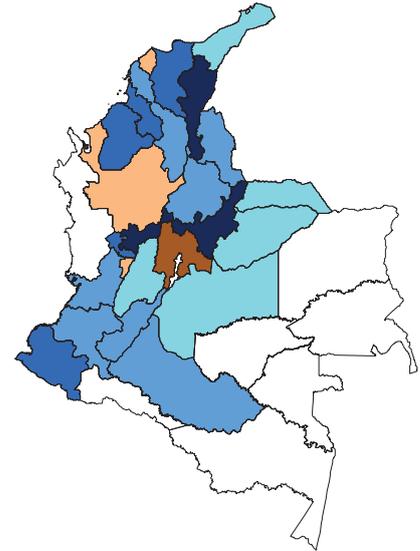
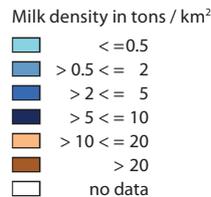
- Milk production (cow's): 5.4 mill t ECM (number 29 in the world)
- No. of dairy farms: 214,000
- Share of milk produced in farms with more than 100 cows: 77%
- Milk price: -4% to world market
- Feed price: 70% to world market

Key developments 2006-2010

- Milk production growth: -1.9% per year
- Share of time milk price was above world market level: 40%
- Milk price was on average -2% below the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

Milk density 2010

in tons / km²



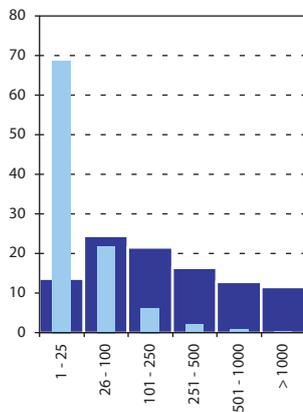
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	4.91	5.08	5.42	5.54	5.68	5.85	5.81	5.42	0.7%	-1.9%
Cows (in 1,000's)	3,861	3,939	4,018	4,099	4,181	4,265	4,338	3,337	-1.0%	-5.9%
Milk yield (t/cow/year)	1.3	1.3	1.3	1.4	1.4	1.4	1.3	1.6	1.8%	4.3%
Farm structure										
No. of dairy farms (in 1,000's)						198	214	214		2.0%
Average farm size (cows/farm)						22	20	16		-7.8%
Prices in national currency										
Milk : feed price ratio	0.8	0.8	0.9	0.9	1.2	0.9	0.9	1.0	2.2%	1.7%
Cull cow (COP / kg live weight)						2,150	2,200	1,900		-3.0%
Land - buy (1,000 COP / ha)						7,500	8,000	8,000		1.6%

Farm structure

% of dairy farms and cows in size classes (2007)

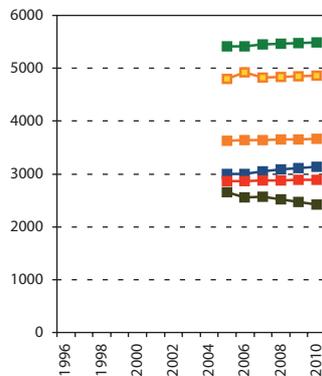
■ Cows per size class
■ Farms per size class



Farm structure

cows per herd size (in 1,000's)

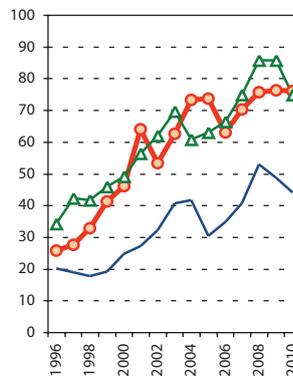
■ 1 - 25 ■ 26 - 100
■ 101 - 250 ■ 251 - 500
■ 501 - 1000 ■ > 1000



Milk and feed price

1,000 COP / 100 kg

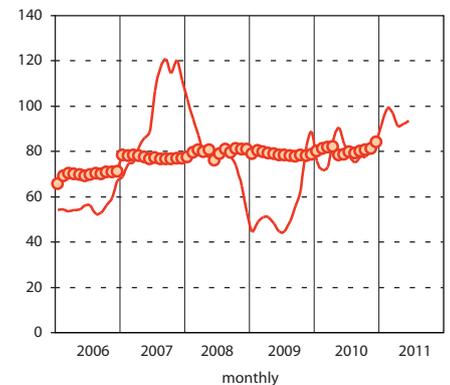
○ National milk price
△ National feed price
— IFCN feed price indicator (world)



Farm gate milk prices

1,000 COP / 100 kg milk (ECM)

○ National price
— IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Farm structure: Cow number 2008-2010 following the trend. Soybean meal price 96-00: IFCN estimate based on average differential between world and national feed price.

Remarks: The farm structure data includes all dairy cattle (dairy and suckler cows).

3.29 Croatia – Milk production fact sheet

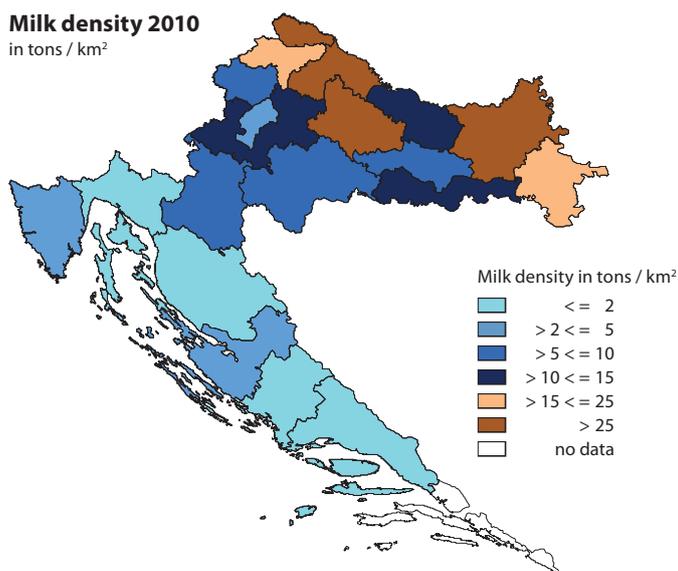


Jasmina Havranek,
Darija Bendelja



Milk density 2010

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 0.77 mill t ECM (number 78 in the world)
- No. of dairy farms: 19,940
- Share of milk produced in farms with more than 50 cows: 19%
- Milk price: -9% to world market
- Feed price: -6% to world market

Key developments 2006-2010

- Milk production growth: -2.6% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average 9% above the world market
- Share of time feed price was above world market level: 50%
- Share of time milk : feed price ratio was above 1.5 (favourable): 80%

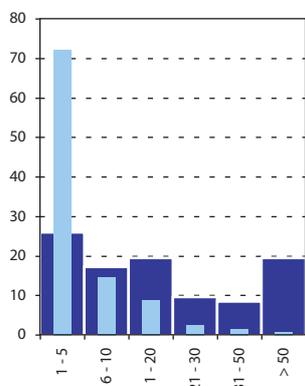
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.60	0.64	0.61	0.70	0.69	0.85	0.84	0.77	1.8%	-2.6%
Cows (in 1,000's)	233	231	215	224	229	241	226	198	-1.2%	-4.8%
Milk yield (t/cow/year)	2.6	2.8	2.8	3.1	3.0	3.5	3.7	3.9	3.0%	2.3%
Farm structure										
No. of dairy farms (in 1,000's)				65	51	38	27	20		-15.0%
Average farm size (cows/farm)				3.4	4.5	6.3	8.2	9.9		12.0%
Prices in national currency										
Milk : feed price ratio						2.0	1.9	1.7		
Cull cow (HRK / kg live weight)										
Land - buy (HRK / ha)										

Farm structure

% of dairy farms and cows in size classes (2010)

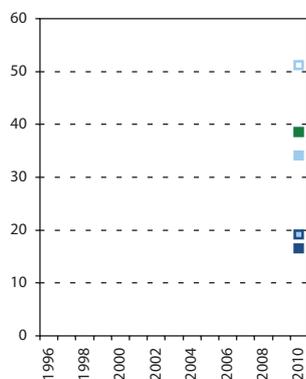
■ Cows per size class
■ Farms per size class



Farm structure

cows per herd size (in 1,000's)

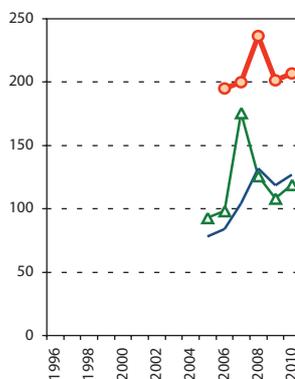
□ 1 - 5 □ 6 - 10
■ 11 - 20 ■ 21 - 30
■ 31 - 50 ■ > 50



Milk and feed price

HRK / 100 kg

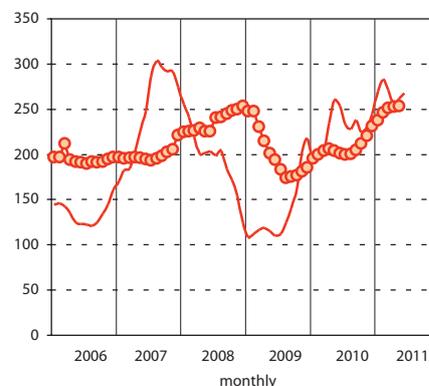
○ National milk price
△ National feed price
— IFCN feed price indicator (world)



Farm gate milk prices

HRK / 100 kg milk (ECM)

○ National price
— IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Remarks: Dairy farms: The data shows the numbers of milk suppliers not total dairy farm number.



STATUS AND KEY DEVELOPMENTS

Status 2010

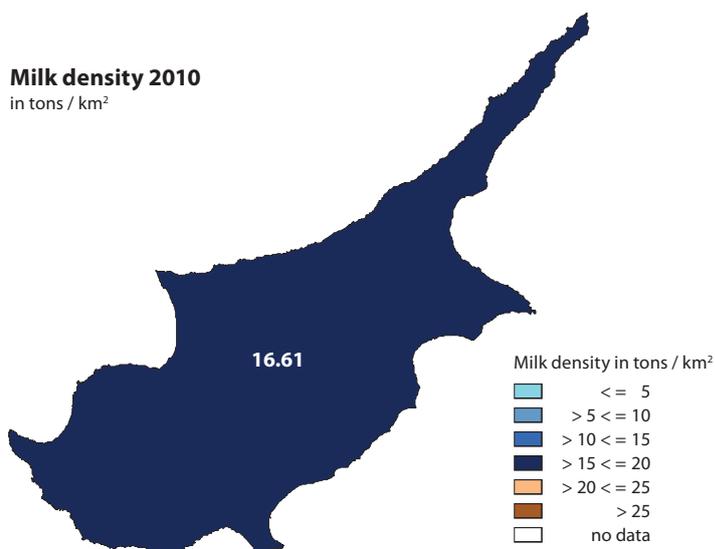
- Milk production (cow's): 0.2 mill t ECM (number 112 in the world)
- No. of dairy farms: 233
- Share of milk produced in farms with more than 50 cows: 99% (2007)
- Milk price: 67% to world market
- Feed price: -17% to world market

Key developments 2006-2010

- Milk production growth: +1% per year
- Share of time milk price was above world market level: 100%
- Milk price was on average 84% above the world market
- Share of time feed price was above world market level: 40%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

Milk density 2010

in tons / km²

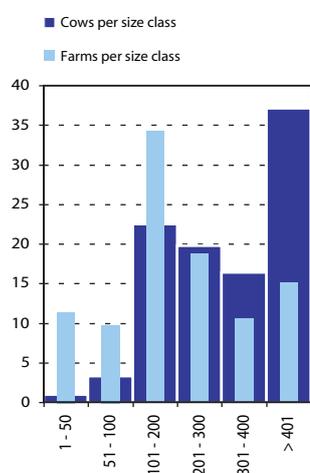


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.14	0.13	0.15	0.14	0.14	0.15	0.15	0.16	0.6%	1.0%
Cows (in 1,000's)	25	25	24	26	26	24	24	24	-0.4%	-0.3%
Milk yield (t/cow/year)	5.7	5.4	6.2	5.5	5.4	6.2	6.4	6.6	1.0%	1.3%
Farm structure										
No. of dairy farms (in 1,000's)	0.33	0.28	0.27	0.26	0.26	0.25	0.24	0.23	-2.4%	-1.5%
Average farm size (cows/farm)	77	89	87	100	101	97	98	101	2.0%	1.2%
Prices in national currency										
Milk : feed price ratio	2.3	2.3	2.1	2.1	3.5	3.3	3.3	3.6	3.3%	2.7%
Cull cow (EUR / kg live weight)										
Land - buy (EUR / ha)										

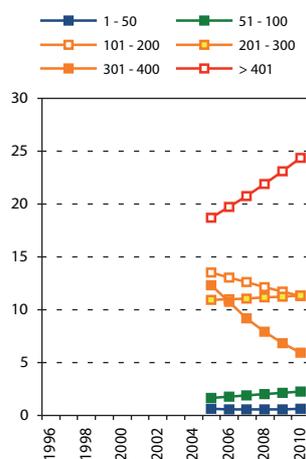
Farm structure

% of dairy farms and cows in size classes (2007)



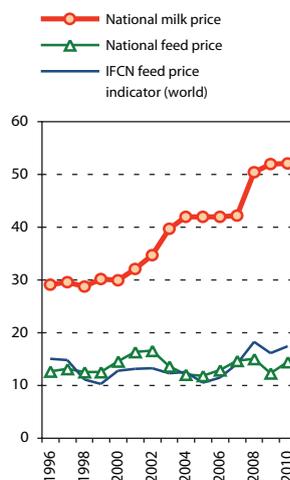
Farm structure

cows per herd size (in 1,000's)



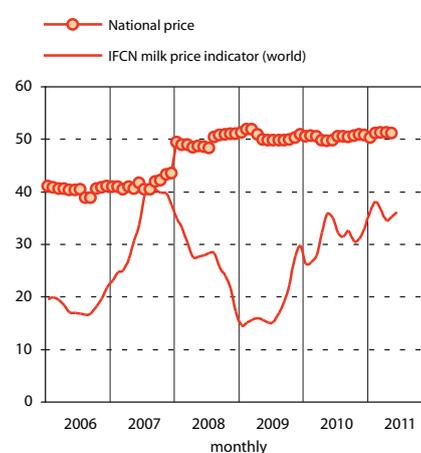
Milk and feed price

EUR / 100 kg



Farm gate milk prices

EUR / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Dairy farm number 2008-2010. Farm structure: Cow number 2008-2010 following the trend.

Remarks: Farm structure: Cow numbers are based on annual cattle farming reviews 2005 and 2007.

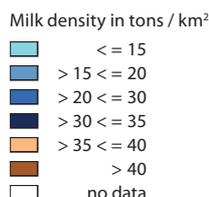
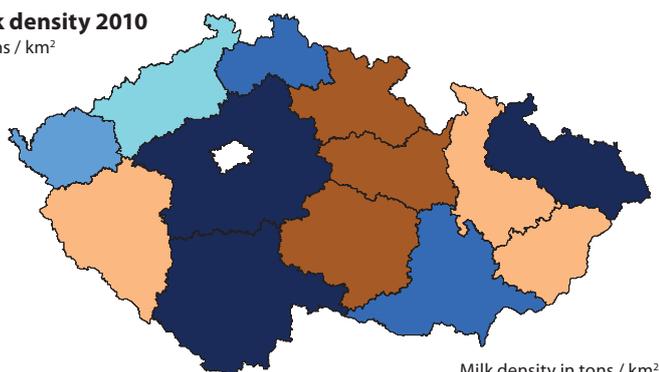


Iveta Bošková



Milk density 2010

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 2.7 mill t ECM (number 41 in the world)
- No. of dairy farms: 2,344
- Share of milk produced in farms with more than 50 cows: 98%
- Milk price: -8% to world market
- Feed price: 0% to world market

Key developments 2006-2010

- Milk production growth: -0.9% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average 10% above the world market
- Share of time feed price was above world market level: 80%
- Share of time milk : feed price ratio was above 1.5 (favourable): 80%

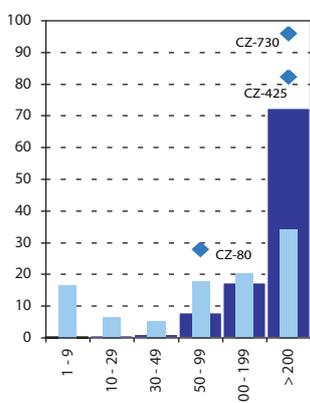
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	2.92	2.82	2.80	2.80	2.70	2.75	2.76	2.65	-0.7%	-0.9%
Cows (in 1,000's)	722	598	515	477	433	423	403	378	-4.5%	-2.7%
Milk yield (t/cow/year)	4.0	4.7	5.4	5.9	6.2	6.5	6.9	7.0	4.0%	1.9%
Farm structure										
No. of dairy farms (in 1,000's)	2.3	2.0	2.3	3.6	3.0	2.7	2.5	2.3	0.2%	-3.3%
Average farm size (cows/farm)	319	297	226	133	147	158	164	161	-4.7%	0.6%
Prices in national currency										
Milk : feed price ratio	1.5	1.8	1.7	1.9	1.8	2.3	1.6	1.7	0.6%	-7.6%
Cull cow (CZK / kg live weight)	25.11	26.49	27.05	21.05	22.96	29.34	26.97	25.90	0.2%	-3.1%
Land - buy (1,000 CZK / ha)	37	41	50	35	38	40	64	79	5.6%	18.5%

Farm structure

% of dairy farms and cows in size classes (2009)

- Cows per size class
- Farms per size class
- ◆ IFCN typical farms*

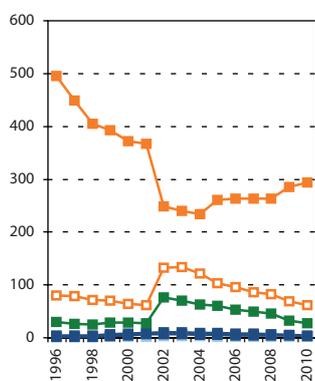


* size class where IFCN typical farms are

Farm structure

cows per herd size (in 1,000's)

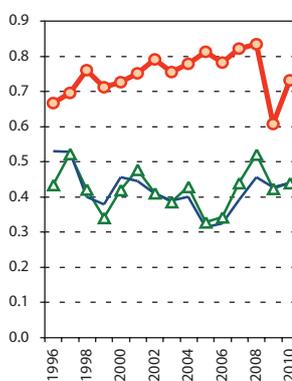
- 1 - 9
- 10 - 29
- 30 - 49
- 50 - 99
- 100 - 199
- > 200



Milk and feed price

1,000 CZK / 100 kg

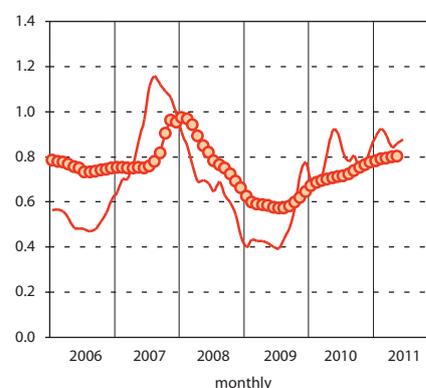
- National milk price
- △ National feed price
- IFCN feed price indicator (world)



Farm gate milk prices

1,000 CZK / 100 kg milk (ECM)

- National price
- IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Farm structure 2002-2009 based on national surveys and statistics; cow number 2010 following the trend. Land price 2010.





Susanne Clausen

STATUS AND KEY DEVELOPMENTS

Status 2010

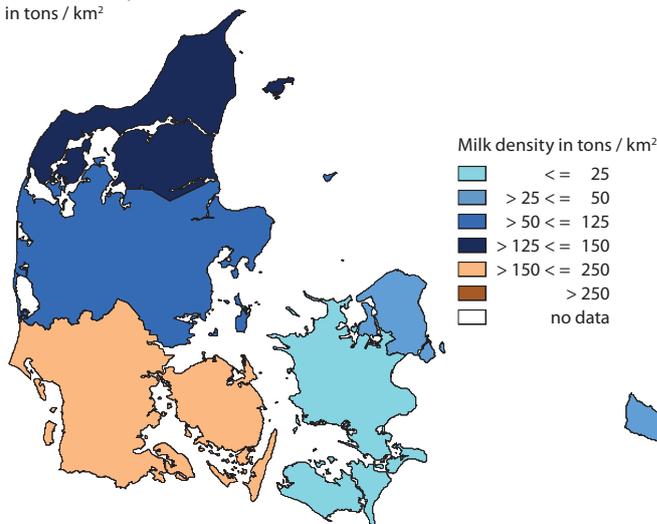
- Milk production (cow's): 5.2 mill t ECM (number 31 in the world)
- No. of dairy farms: 4,100
- Share of milk produced in farms with more than 50 cows: 97%
- Milk price: -1% to world market
- Feed price: 9% to world market

Key developments 200-2010

- Milk production growth: +1.6% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average 19% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

Milk density 2010

in tons / km²

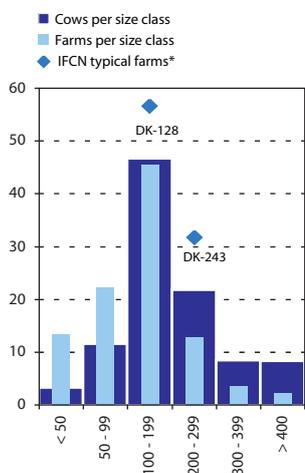


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	4.95	4.93	4.95	4.82	4.77	4.84	4.94	5.15	0.3%	1.6%
Cows (in 1,000's)	697	680	636	610	563	550	558	574	-1.4%	1.1%
Milk yield (t/cow/year)	7.1	7.3	7.8	7.9	8.5	8.8	8.8	9.0	1.7%	0.5%
Farm structure										
No. of dairy farms (in 1,000's)	14.8	12.2	10.5	8.9	7.3	5.9	4.9	4.1	-8.7%	-8.8%
Average farm size (cows/farm)	47	56	61	69	78	93	114	140	8.1%	10.9%
Prices in national currency										
Milk : feed price ratio	2.0	2.3	2.2	2.2	2.0	2.0	1.6	1.6	-1.4%	-5.1%
Cull cow (DKK / kg live weight)		7.36	7.09	6.01	5.82	7.69	7.60	6.55		-3.9%
Land - buy (DKK / ha)	59,250	73,000	84,268	102,182	112,567	180,403	239,642	174,979	8.0%	-0.8%
Quota (DKK / kg milk)		2.92	3.59	2.85	4.43	4.47	1.55	2.06		-17.6%

Farm structure

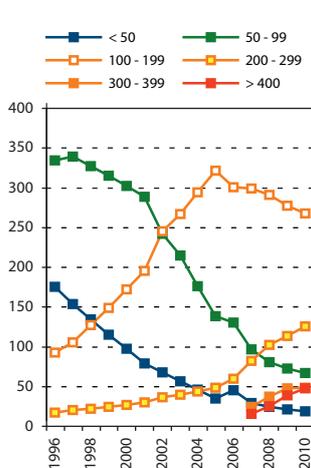
% of dairy farms and cows in size classes (2010)



* size class where IFCN typical farms are

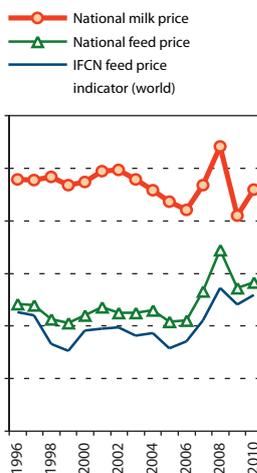
Farm structure

cows per herd size (in 1,000's)



Milk and feed price

DKK / 100 kg



Farm gate milk prices

DKK / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

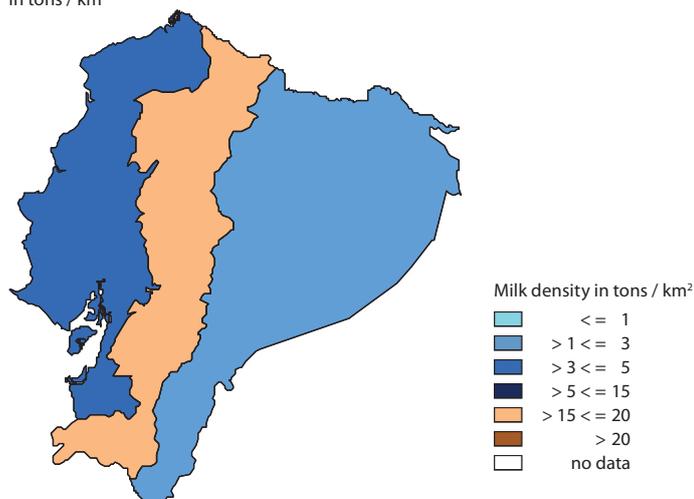


Rafael Vizcarra



Milk density 2010

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 1.6 mill t ECM (number 57 in the world)
- No. of dairy farms: 299,000
- Milk price: 7% to world market
- Feed price: 89% to world market

Key developments 2006-2010

- Milk production growth: +1.9% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average 0% below the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 20%

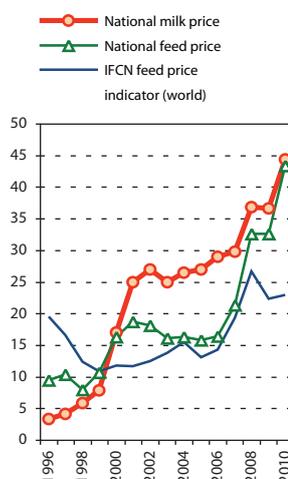
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	1.63	1.59	1.21	1.30	1.47	1.52	1.57	1.64	0.0%	1.9%
Cows (in 1,000's)	825	988	1,117	1,179	1,260	1,371	1,467	1,484	4.3%	2.0%
Milk yield (t/cow/year)	2.0	1.6	1.1	1.1	1.2	1.1	1.1	1.1	-4.1%	-0.1%
Farm structure										
No. of dairy farms (in 1,000's)				248	268	289	299	299		0.9%
Average farm size (cows/farm)				4.8	4.7	4.7	4.9	5.0		1.1%
Prices in national currency										
Milk : feed price ratio	0.4	0.7	1.0	1.5	1.6	1.8	1.1	1.0	7.9%	-12.8%
Cull cow (USD / kg live weight)			0.80	1.23	1.05	1.05	1.13	1.21		3.6%
Land - buy (USD / ha)							5,200	5,200		



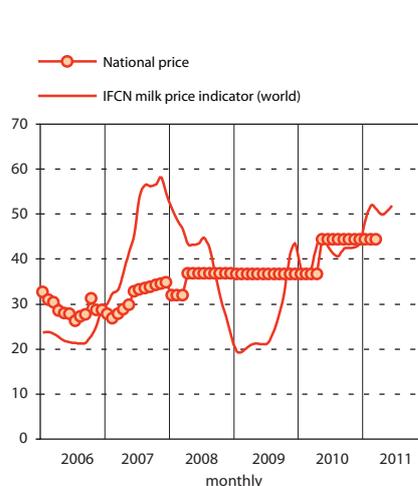
Milk and feed price

USD / 100 kg



Farm gate milk prices

USD / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Dairy farm number 2002-2006 interpolated. Soybean price 1996-2007: world market prices used since no statistical information is available.

Remarks: Official currency since 2004: USD; all price data adjusted.



Adel Khattab



3.34 Egypt – Milk production fact sheet

STATUS AND KEY DEVELOPMENTS

Status 2010

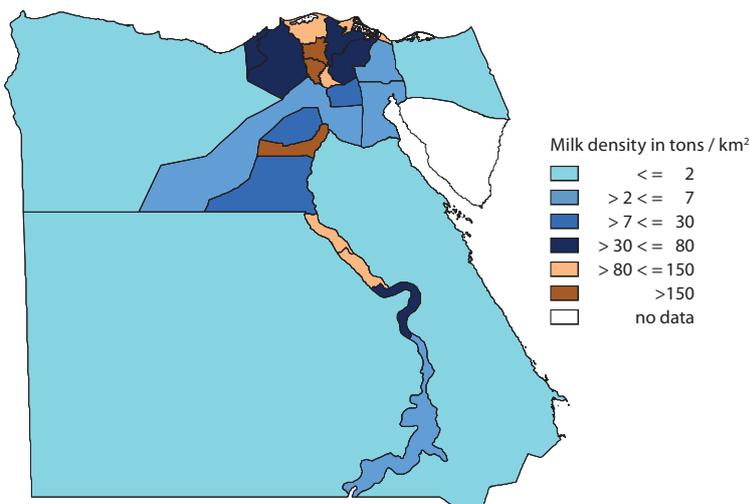
- Milk production (cow's and buffalo's): 6.3 mill t ECM (number 24 in the world)
- No. of dairy farms: 975,000
- Share of milk produced in farms with more than 50 cows: 3%
- Milk price: 85% to world market
- Feed price: 66% to world market

Key developments 2006-2010

- Milk production growth: -1.9% per year
- Share of time milk price was above world market level: 100%
- Milk price was on average 81% above the world market
- Share of time feed price was above world market level: 80%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

Milk density 2010

in tons / km²

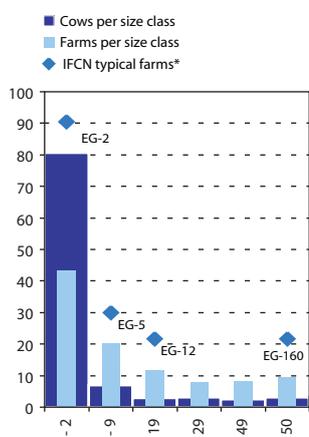


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's and buffalo's)										
Production (mill t)	4.07	4.39	4.59	5.02	5.14	6.80	7.54	6.30	3.2%	-1.9%
Cows and buffalos (in 1,000's)	2,513	2,756	2,887	3,094	3,254	3,366	3,554	3,600	2.6%	1.7%
Milk yield (t/cow/year)	1.6	1.6	1.6	1.6	1.6	2.0	2.1	1.7	0.6%	-3.5%
Farm structure										
No. of dairy farms (in 1,000's)	535	612	725	866	945	981	994	975	4.4%	-0.2%
Average farm size (cows/farm)	4.7	4.5	4.0	3.6	3.4	3.4	3.6	3.7	-1.7%	1.8%
Prices in national currency										
Milk : feed price ratio	1.5	2.1	2.5	2.6	2.7	3.4	2.0	2.0	2.2%	-12.1%
Cull cow (EGP / kg live weight)	6.55	7.19	8.11	8.79	11.04	17.00	21.00	24.00	9.7%	9.0%
Land - buy (EGP / ha)	96,000	115,000	130,000	144,000	165,000	185,000	221,000	251,000	7.1%	7.9%

Farm structure

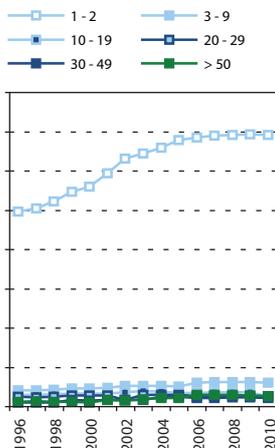
% of dairy farms and cows in size classes (2010)



* size class where IFCN typical farms are

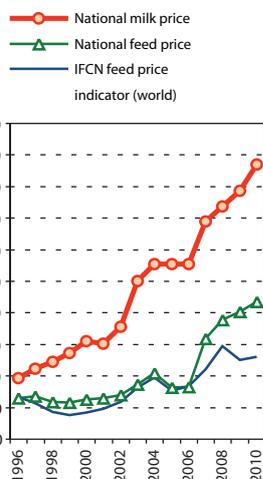
Farm structure

cows per herd size (in 1,000's)



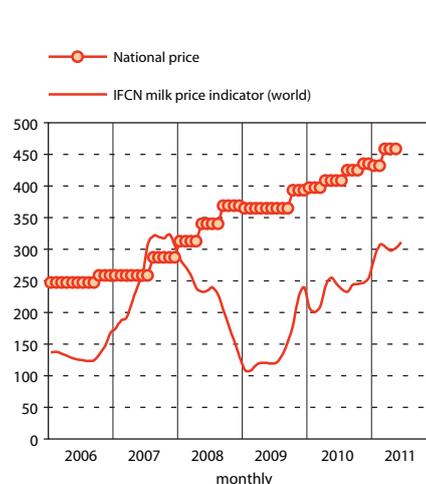
Milk and feed price

EGP / 100 kg



Farm gate milk prices

EGP / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Barley price 1996-2010 linked to world market price. Trend of the world soybean meal price used for the years 2007-2008.

Remarks: Farm structure: cow number show the total dairy herd.

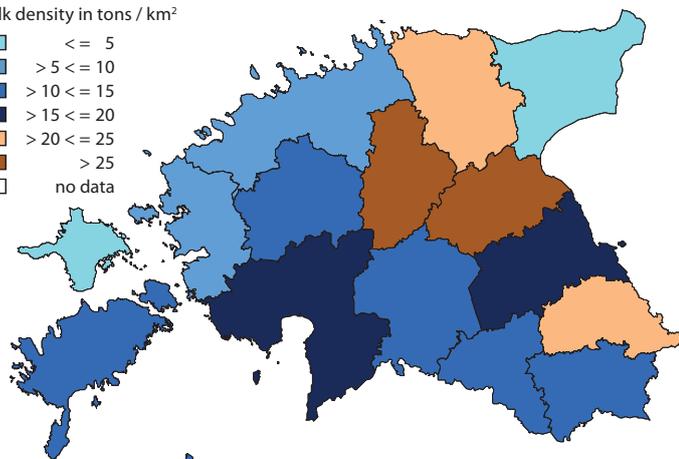
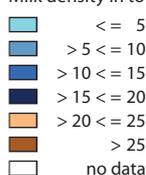
3.35 Estonia – Milk production fact sheet

Katri Kall

Milk density 2010

in tons / km²

Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 0.7 mill t ECM (number 84 in the world)
- No. of dairy farms: 3,467
- Share of milk produced in farms with more than 50 cows: 90%
- Milk price: -12% to world market
- Feed price: -25% to world market

Key developments 2006-2010

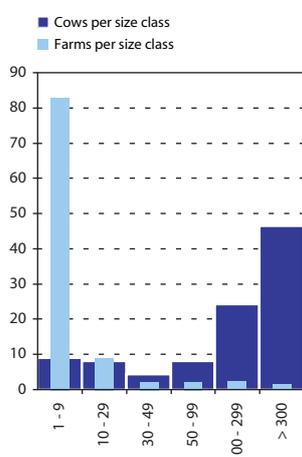
- Milk production growth: -0.8% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average -1% below the world market
- Share of time feed price was above world market level: 40%
- Share of time milk : feed price ratio was above 1.5 (favourable): 80%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.67	0.72	0.62	0.61	0.67	0.71	0.71	0.69	0.2%	-0.8%
Cows (in 1,000's)	172	159	131	116	117	108	100	96	-4.1%	-3.1%
Milk yield (t/cow/year)	3.9	4.6	4.8	5.2	5.8	6.5	7.0	7.2	4.4%	2.3%
Farm structure										
No. of dairy farms (in 1,000's)				15	11	8	5	3		-18.0%
Average farm size (cows/farm)				8	11	14	20	28		18.2%
Prices in national currency										
Milk : feed price ratio	1.3	1.6	1.5	1.6	1.8	2.1	1.8	2.1	3.3%	0.4%
Cull cow (EEK / kg live weight)					10.35	13.22	13.93	14.71		2.7%
Land - buy (EEK / ha)		3,919	3,577	4,030	5,498	10,706	15,616	13,832		6.6%

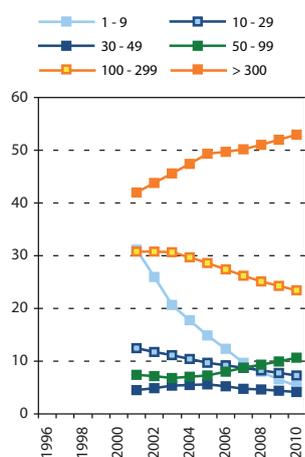
Farm structure

% of dairy farms and cows in size classes (2007)



Farm structure

cows per herd size (in 1,000's)

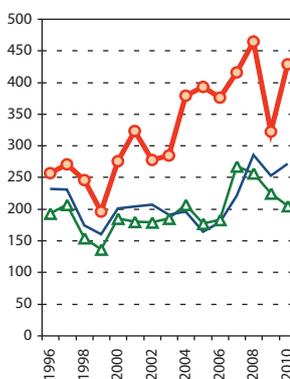


Milk and feed price

EEK / 100 kg

Legend for Milk and feed price chart:

- National milk price (red line with circles)
- National feed price (green line with triangles)
- IFCN feed price indicator (world) (blue line with squares)

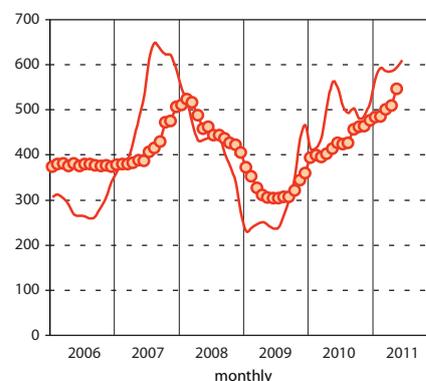


Farm gate milk prices

EEK / 100 kg milk (ECM)

Legend for Farm gate milk prices chart:

- National price (red line with circles)
- IFCN milk price indicator (world) (blue line with squares)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Farm structure: Cow number 2008-2010 following the trend. Dairy farm number 2008-2010. Cull cow and land price 2010.

Remarks: Since no statistical information on soybean meal prices are available the world market price is used.



Zelalem Yilma



STATUS AND KEY DEVELOPMENTS

Status 2010

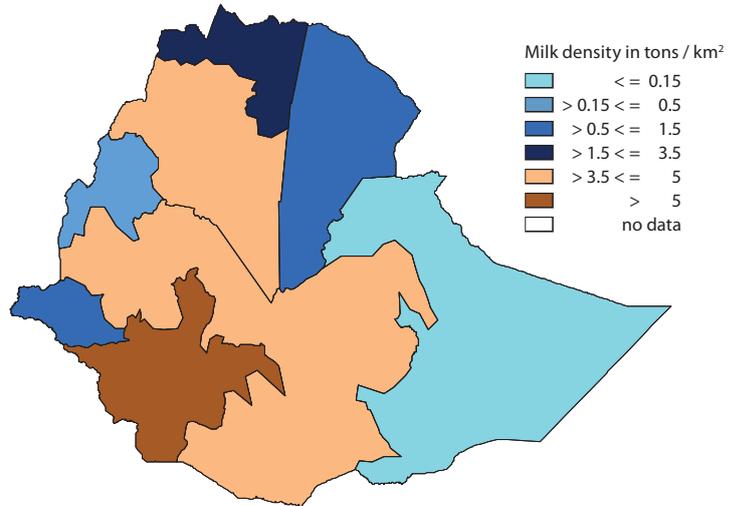
- Milk production (cow's): 3 mill t ECM (number 36 in the world)
- No. of dairy farms: 2,245,600
- Share of milk produced in farms with more than 50 cows: 2%
- Milk price: 10% to world market
- Feed price: 63% to world market

Key developments 2006-2010

- Milk production growth: +6.1% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 30% above the world market
- Share of time feed price was above world market level: 80%
- Share of time milk : feed price ratio was above 1.5 (favourable): 20%

Milk density 2010

in tons / km²

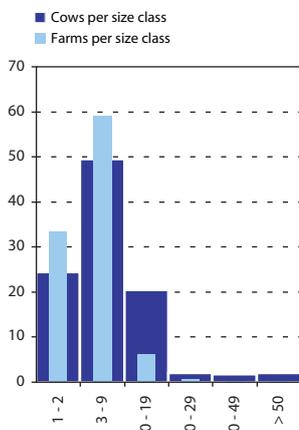


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.96	0.98	1.34	1.66	2.52	2.40	3.33	3.04	8.6%	6.1%
Cows (in 1,000's)	8,809	10,894	10,360	9,307	8,713	8,194	9,923	9,628	0.6%	4.1%
Milk yield (t/cow/year)	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.3	7.9%	1.9%
Farm structure										
No. of dairy farms (in 1,000's)						1,842	2,106	2,246		5.1%
Average farm size (cows/farm)						4.4	4.7	4.3		-0.9%
Prices in national currency										
Milk : feed price ratio	1.4	1.8	2.1	3.1	2.0	2.7	1.1	1.2	-0.8%	-17.9%
Cull cow (ETB / kg live weight)				2.83	4.13	5.00	7.43	9.94		18.7%
Land - buy (ETB / ha)										

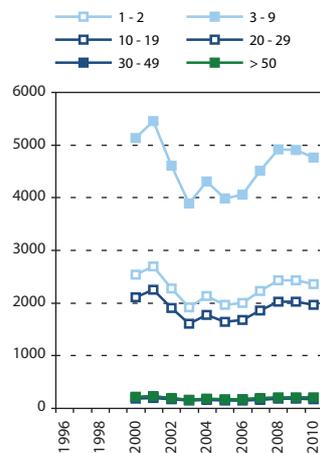
Farm structure

% of dairy farms and cows in size classes (2010)



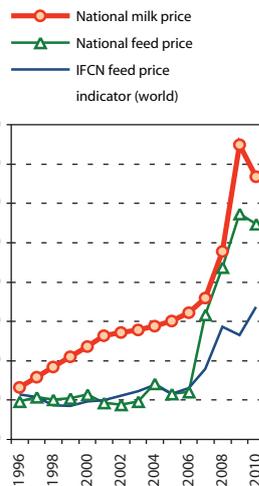
Farm structure

cows per herd size (in 1,000's)



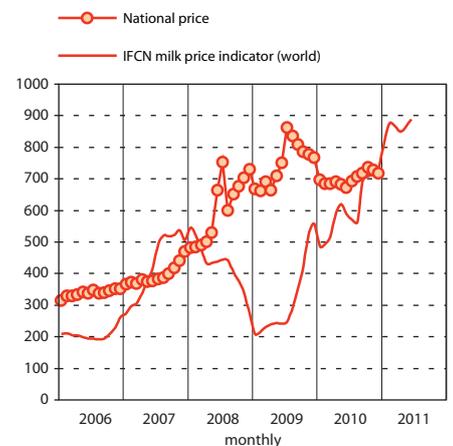
Milk and feed price

ETB / 100 kg



Farm gate milk prices

ETB / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.



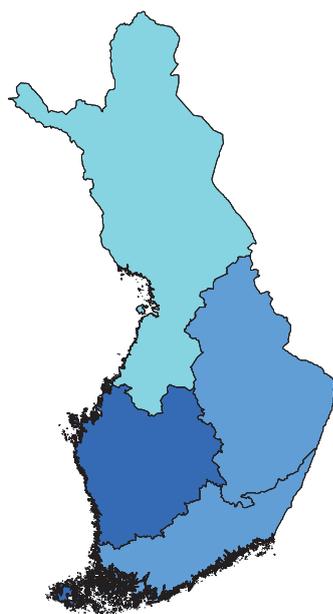
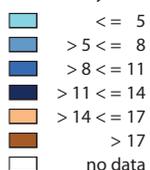
Sami Ovaska,
Jukka Tauriainen,
Timo Sipiläinen,
Matti Ryhänen



Milk density 2010

in tons / km²

Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 2.5 mill t ECM (number 42 in the world)
- No. of dairy farms: 11,256
- Share of milk produced in farms with more than 50 cows: 26%
- Milk price: 18% to world market
- Feed price: 11% to world market

Key developments 2006-2010

- Milk production growth: -0.5% per year
- Share of time milk price was above world market level: 100%
- Milk price was on average 42% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

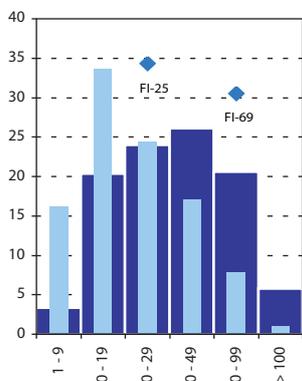
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	2.53	2.54	2.62	2.62	2.54	2.50	2.40	2.45	-0.2%	-0.5%
Cows (in 1,000's)	392	383	364	348	324	309	289	289	-2.1%	-1.7%
Milk yield (t/cow/year)	6.5	6.6	7.2	7.5	7.8	8.1	8.3	8.5	2.0%	1.2%
Farm structure										
No. of dairy farms (in 1,000's)	30	27	23	20	17	15	12	11	-6.8%	-7.2%
Average farm size (cows/farm)	13	14	16	17	19	20	23	26	5.0%	6.0%
Prices in national currency										
Milk : feed price ratio	1.7	1.7	1.7	1.9	1.8	1.9	1.6	1.9	1.0%	0.6%
Cull cow (EUR / kg live weight)	0.75	0.71	0.62	0.48	0.51	0.59	0.68	0.66	-0.9%	2.7%
Land - buy (EUR / ha)	2,663	3,141	3,933	4,301	5,200	5,971	6,648	7,743	7.9%	6.7%
Quota (EUR / kg milk)			0.13	0.25	0.26	0.19	0.10	0.04		-31.9%

Farm structure

% of dairy farms and cows in size classes (2010)

■ Cows per size class
■ Farms per size class
◆ IFCN typical farms*

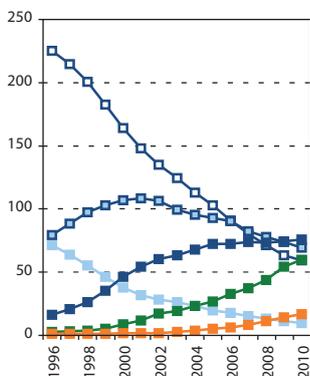


* size class where IFCN typical farms are

Farm structure

cows per herd size (in 1,000's)

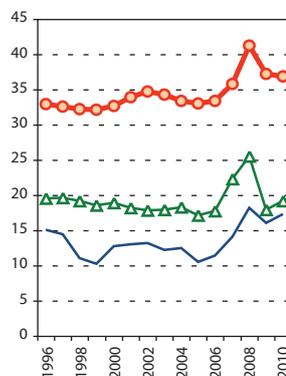
■ 1 - 9 ■ 10 - 19
■ 20 - 29 ■ 30 - 49
■ 50 - 99 ■ > 100



Milk and feed price

EUR / 100 kg

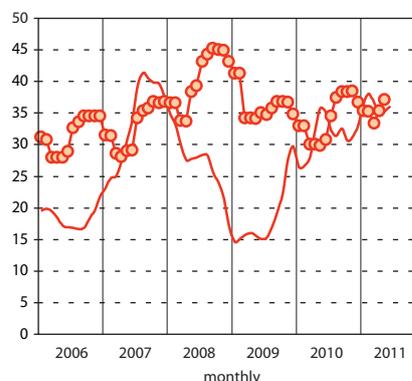
● National milk price
▲ National feed price
— IFCN feed price indicator (world)



Farm gate milk prices

EUR / 100 kg milk (ECM)

● National price
— IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.





STATUS AND KEY DEVELOPMENTS

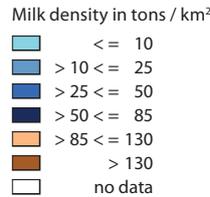
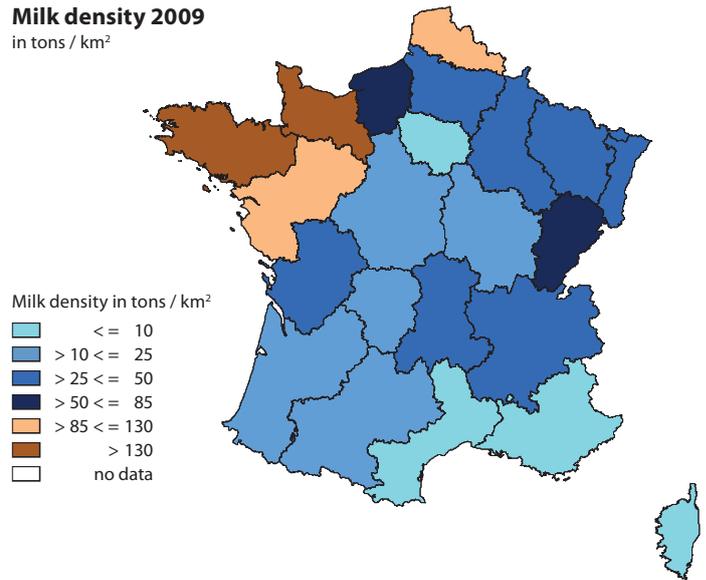
Status 2010

- Milk production (cow's): 24 mill t ECM (number 8 in the world)
- No. of dairy farms: 76,700
- Share of milk produced in farms with more than 50 cows: 53%
- Milk price: -1% to world market
- Feed price: 23% to world market

Key developments 2006-2010

- Milk production growth: -0.4% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average 22% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 80%

Milk density 2009
in tons / km²

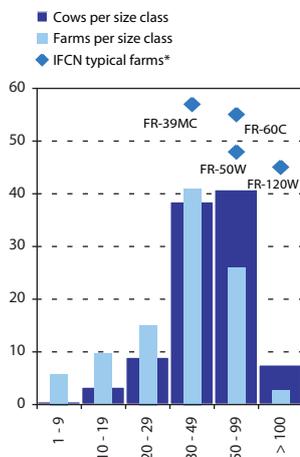


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	25.17	24.96	24.94	25.31	24.53	24.37	24.23	23.99	-0.3%	-0.4%
Cows (in 1,000's)	4,566	4,432	4,153	4,134	3,947	3,799	3,794	3,626	-1.6%	-1.2%
Milk yield (t/cow/year)	5.5	5.6	6.0	6.1	6.2	6.4	6.4	6.6	1.3%	0.8%
Farm structure										
No. of dairy farms (in 1,000's)	155	138	133	121	112	94	85	77	-4.9%	-5.0%
Average farm size (cows/farm)	30	32	31	34	35	40	45	47	3.4%	4.1%
Prices in national currency										
Milk : feed price ratio	1.4	1.7	1.9	2.0	1.9	1.9	1.6	1.5	0.2%	-6.8%
Cull cow (EUR / kg live weight)	1.13	1.30	1.21	1.05	1.22	1.33	1.33	1.26	0.8%	-1.3%
Land - buy (EUR / ha)	2,860	3,160	3,570	4,180	4,510	4,740	5,170	5,173	4.3%	2.2%
Quota (EUR / kg milk)	no open quota market									

Farm structure

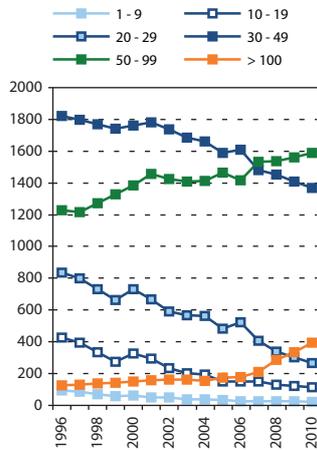
% of dairy farms and cows in size classes (2008)



* size class where IFCN typical farms are

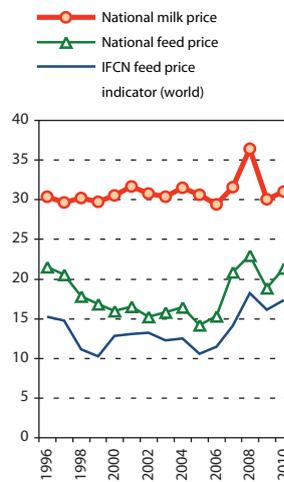
Farm structure

cows per herd size (in 1,000's)



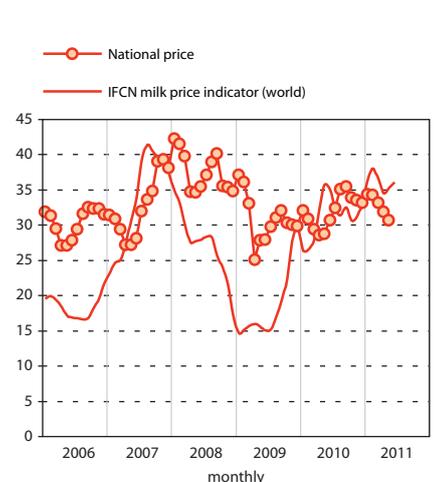
Milk and feed price

EUR / 100 kg



Farm gate milk prices

EUR / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, milk production.

Estimates done for: Farm structure: Cow number 2009-2010 following the trend. Land price 2010.

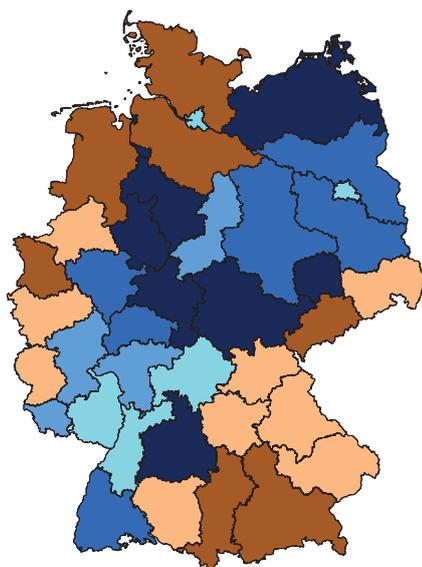
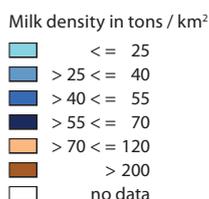


Eva Schröer-Merker



Milk density 2010

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 30.5 mill t ECM (number 6 in the world)
- No. of dairy farms: 91,550
- Share of milk produced in farms with more than 50 cows: 64%
- Milk price: -1% to world market
- Feed price: -2% to world market

Key developments 2006-2010

- Milk production growth: +1.4% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 18% above the world market
- Share of time feed price was above world market level: 80%
- Share of time milk : feed price ratio was above 1.5 (favourable): 60%

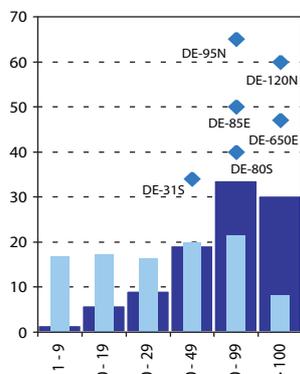
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	29.88	29.44	29.34	28.82	29.29	28.76	29.39	30.47	0.1%	1.4%
Cows (in 1,000's)	5,195	4,833	4,564	4,373	4,287	4,054	4,229	4,182	-1.5%	0.8%
Milk yield (t/cow/year)	5.8	6.1	6.4	6.6	6.8	7.1	7.0	7.3	1.7%	0.7%
Farm structure										
No. of dairy farms (in 1,000's)	186	164	142	127	116	106	99	92	-4.9%	-3.6%
Average farm size (cows/farm)	28	30	32	35	37	38	43	46	3.6%	4.5%
Prices in national currency										
Milk : feed price ratio	1.8	2.1	2.1	2.2	2.1	2.1	1.4	1.8	0.3%	-3.6%
Cull cow (EUR / kg live weight)	1.11	1.18	1.17	0.94	1.06	1.25	1.26	1.29	1.1%	0.7%
Land - buy (EUR / ha)	10,394	9,500	9,081	9,465	9,233	8,909	9,955	12,484	1.3%	8.8%
Quota (EUR / kg milk)	0.82	0.85	0.57	0.72	0.43	0.48	0.34	0.10	-14.2%	-33.0%

Farm structure

% of dairy farms and cows in size classes (2010)

- Cows per size class
- Farms per size class
- ◆ IFCN typical farms*

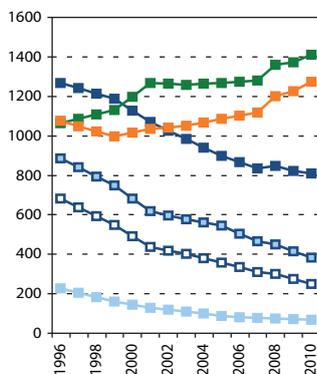


* size class where IFCN typical farms are

Farm structure

cows per herd size (in 1,000's)

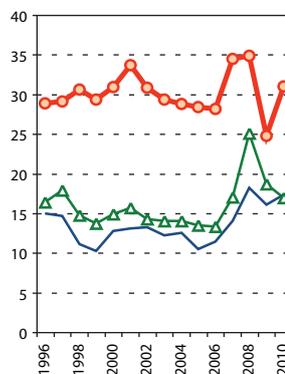
- 1 - 9
- 10 - 19
- 20 - 29
- 30 - 49
- 50 - 99
- > 100



Milk and feed price

EUR / 100 kg

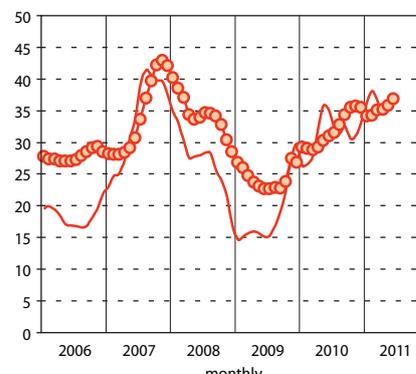
- National milk price
- ▲ National feed price
- IFCN feed price indicator (world)



Farm gate milk prices

EUR / 100 kg milk (ECM)

- National price
- IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Farm structure: Cow number 2008-2010 following the trend. Land price 2010. Cull cow price 2008-2010. Regional milk production 2010.

Remarks: More typical farms are analysed in the Chapter 1 which are not shown in the chart.



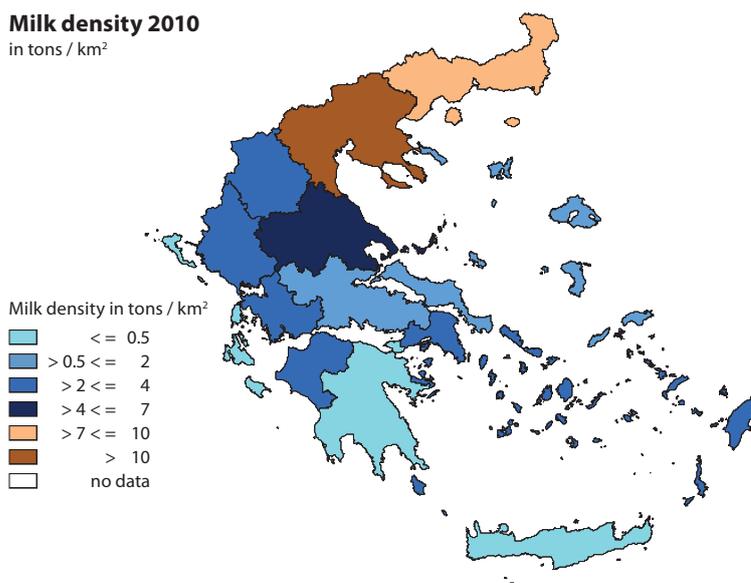


3.40 Greece – Milk production fact sheet



Milk density 2010

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 0.7 mill t ECM (number 43 in the world)
- No. of dairy farms: 6,034
- Share of milk produced in farms with more than 50 cows: 64% (2007)
- Milk price: 20% to world market
- Feed price: 30% to world market

Key developments 2006-2010

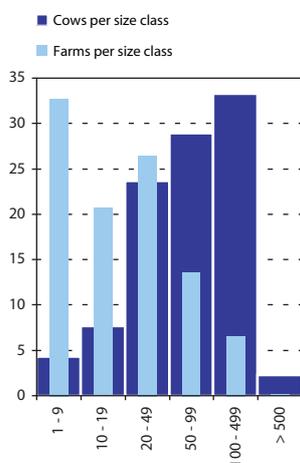
- Milk production growth: +0.4% per year
- Share of time milk price was above world market level: 100%
- Milk price was on average 50% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.74	0.74	0.78	0.78	0.78	0.74	0.78	0.75	0.1%	0.4%
Cows (in 1,000's)	185	172	180	152	150	168	154	144	-1.8%	-3.8%
Milk yield (t/cow/year)	4.0	4.3	4.3	5.2	5.2	4.4	5.1	5.2	1.9%	4.3%
Farm structure										
No. of dairy farms (in 1,000's)	24	17	12	12	11	9	7	6	-9.3%	-9.3%
Average farm size (cows/farm)	8	10	15	13	14	19	21	24	8.3%	6.0%
Prices in national currency										
Milk : feed price ratio	2.1	2.1	2.4	2.5	2.0	2.2	1.5	1.7	-1.7%	-6.3%
Cull cow (EUR / kg live weight)										
Land - buy (EUR / ha)										

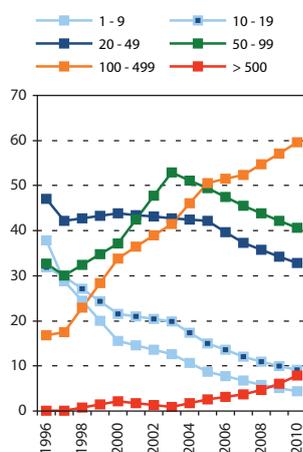
Farm structure

% of dairy farms and cows in size classes (2007)



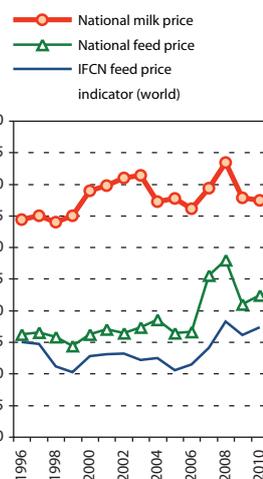
Farm structure

cows per herd size (in 1,000's)



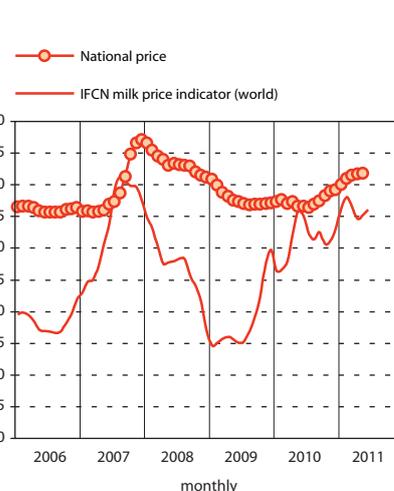
Milk and feed price

EUR / 100 kg



Farm gate milk prices

EUR / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Farm structure: Cow number 2008-2010 following the trend.

Remarks: Since no statistical information on soybean meal and barley prices are available the European trend is used.

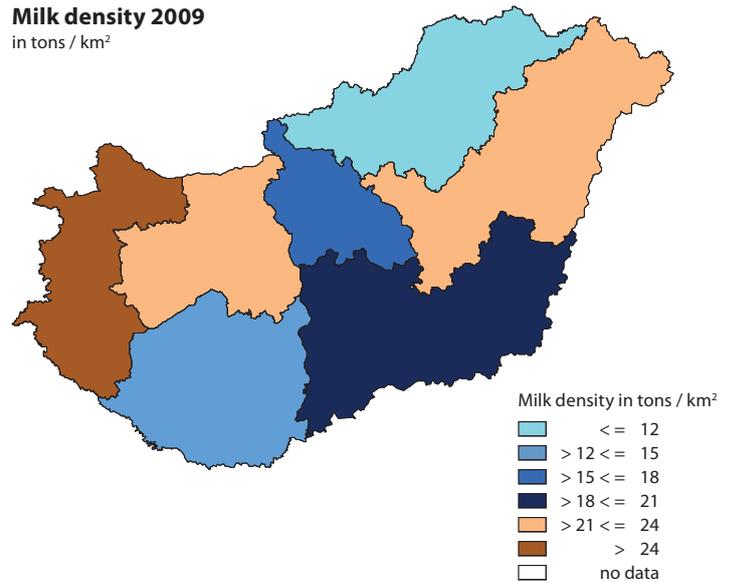



STATUS AND KEY DEVELOPMENTS
Status 2010

- Milk production (cow's): 1.6 mill t ECM (number 58 in the world)
- No. of dairy farms: 11,542
- Share of milk produced in farms with more than 50 cows: 74% (2007)
- Milk price: -14% to world market
- Feed price: 11% to world market

Key developments 2006-2010

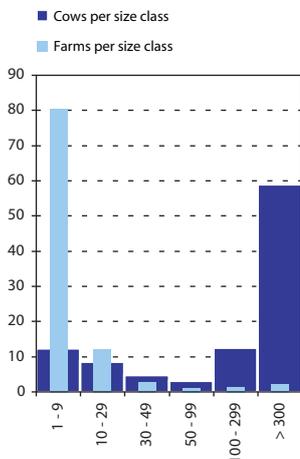
- Milk production growth: -2.4% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average 6% above the world market
- Share of time feed price was above world market level: 60%
- Share of time milk : feed price ratio was above 1.5 (favourable): 60%

Milk density 2009
in tons / km²

Key variables

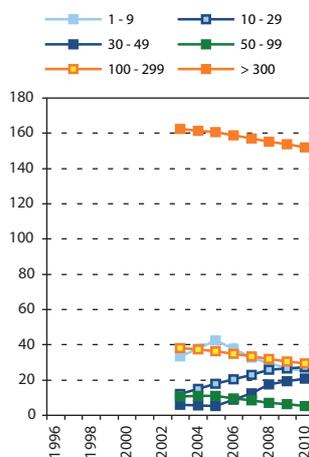
	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	1.92	1.99	2.02	2.01	1.81	1.75	1.77	1.59	-1.4%	-2.4%
Cows (in 1,000's)	386	384	355	338	304	268	264	240	-3.3%	-2.7%
Milk yield (t/cow/year)	5.0	5.2	5.7	5.9	5.9	6.5	6.7	6.6	2.1%	0.4%
Farm structure										
No. of dairy farms (in 1,000's)			35	26	19	14	12	12		-5.1%
Average farm size (cows/farm)			10	13	16	19	21	21		2.5%
Prices in national currency										
Milk : feed price ratio	1.2	2.4	1.9	2.4	1.9	1.9	2.0	1.4	0.8%	-7.1%
Cull cow (HUF / kg live weight)					218	261	271	285		2.2%
Land - buy (1,000 HUF / ha)					346	388	439	478		5.4%
Quota (HUF / kg milk)										

Farm structure

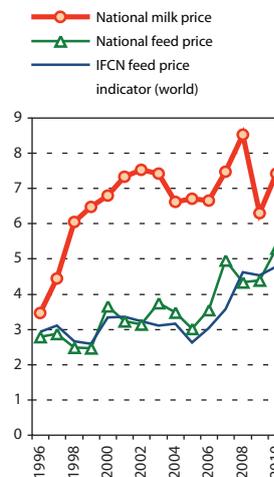
% of dairy farms and cows in size classes (2007)


Farm structure

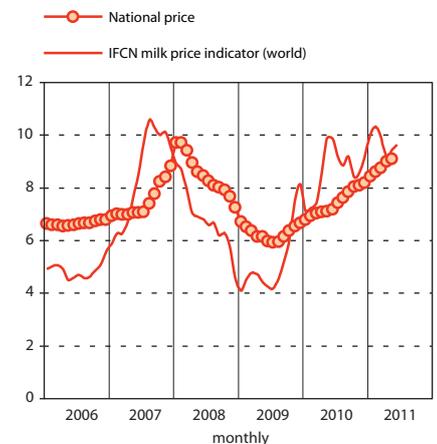
cows per herd size (in 1,000's)


Milk and feed price

1,000 HUF / 100 kg


Farm gate milk prices

1,000 HUF / 100 kg milk (ECM)


Explanations
Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, milk production.

Estimates done for: Farm structure: Cow number 2008-2010 following the trend.

Remarks: Dairy farm numbers include dairy and beef farms, no separation in national statistics.

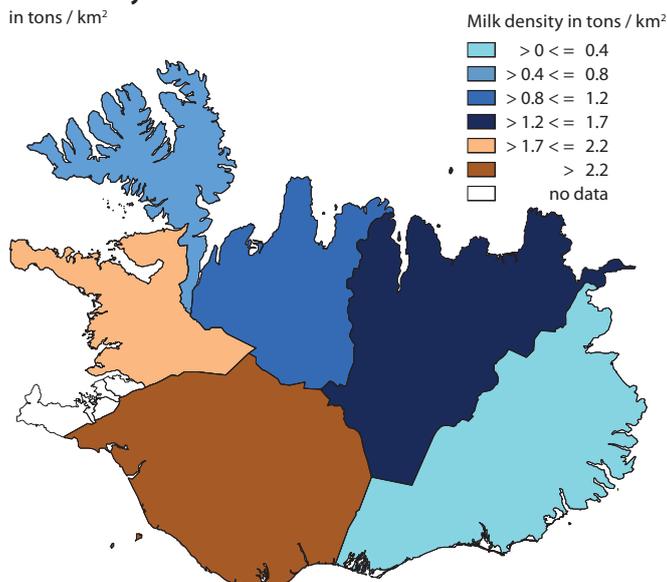


Baldur H. Benjamínsson



Milk density 2010

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 0.1 mill t ECM (number 122 in the world)
- No. of dairy farms: 690
- Share of milk produced in farms with more than 50 cows: 33%
- Milk price: 33% to world market
- Feed price: 142% to world market

Key developments 2006-2010

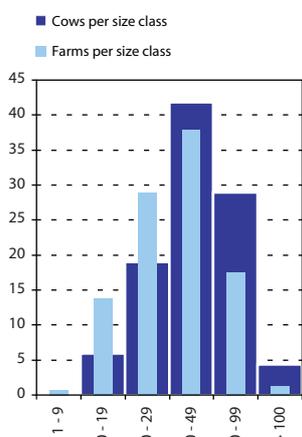
- Milk production growth: +2.8% per year
- Share of time milk price was above world market level: 100%
- Milk price was on average 81% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.10	0.11	0.11	0.12	0.12	0.12	0.14	0.13	1.8%	2.8%
Cows (in 1,000's)	30	29	28	26	25	24	26	26	-1.0%	2.0%
Milk yield (t/cow/year)	3.5	3.7	4.1	4.7	4.9	5.0	5.3	5.2	2.8%	0.8%
Farm structure										
No. of dairy farms (in 1,000's)	1.29	1.19	1.04	0.93	0.85	0.75	0.70	0.69	-4.4%	-1.9%
Average farm size (cows/farm)	23	24	27	28	29	32	37	38	3.5%	4.0%
Prices in national currency										
Milk : feed price ratio				1.4	1.3	1.2	1.0	1.0		-5.2%
Cull cow (ISK / kg live weight)				123	153	213	240	260		5.1%
Land - buy (1,000 ISK / ha)										
Quota (ISK / kg milk)					308	280	288	280		0.0%

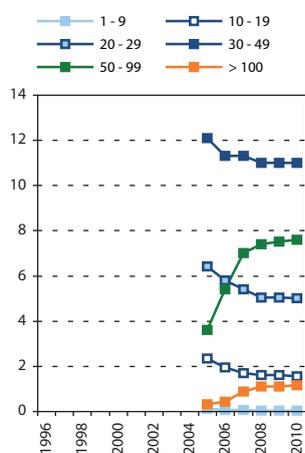
Farm structure

% of dairy farms and cows in size classes (2010)



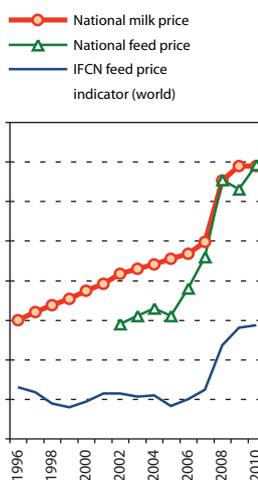
Farm structure

cows per herd size (in 1,000's)



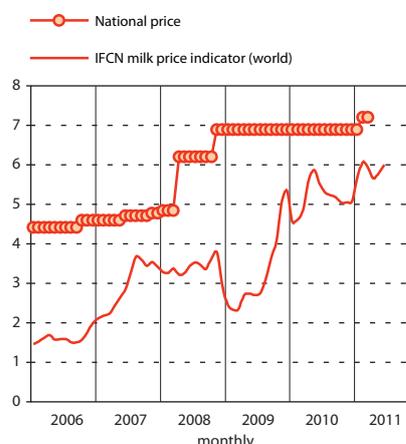
Milk and feed price

1,000 ISK / 100 kg



Farm gate milk prices

1,000 ISK / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.





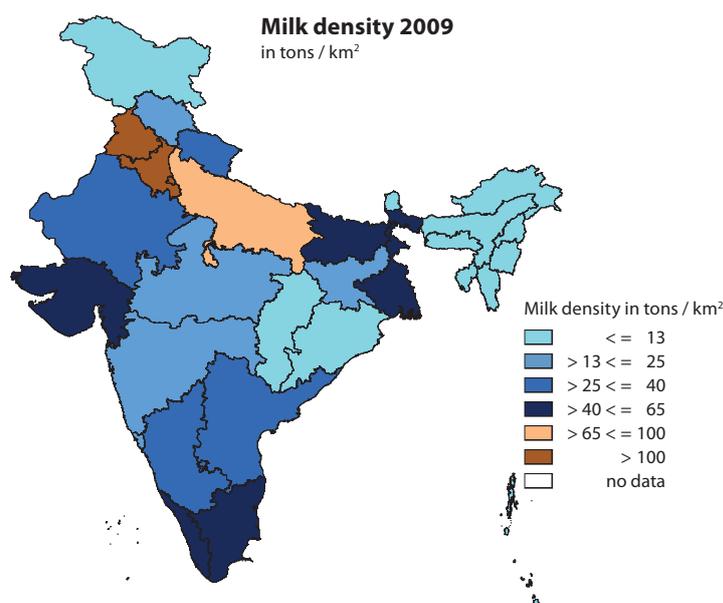
STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's and buffalo's): 125.8 mill t ECM (number 1 in the world)
- No. of dairy farms: 75 mill (2007)
- Share of milk produced in farms with more than 20 cows: 10% (2004)
- Milk price: -12% to world market
- Feed price: 4% to world market

Key developments 2006-2010

- Milk production growth: +2.5% per year
- Share of time milk price was above world market level: 40%
- Milk price was on average -17% below the world market
- Share of time feed price was above world market level: 60%
- Share of time milk : feed price ratio was above 1.5 (favourable): 40%

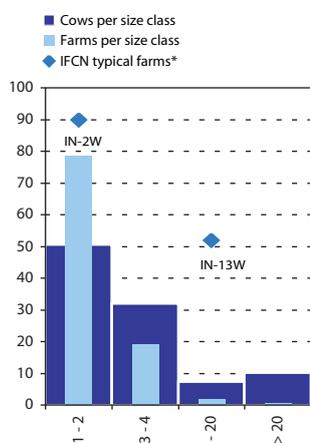


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's and buffalo's)										
Production (mill t)	77.35	84.82	90.81	95.09	104.28	114.00	119.20	125.82	3.5%	2.5%
Cows and buffalos (in 1,000's)	100,962	102,767	103,768	106,296	110,158	115,142	120,378	125,881	1.6%	2.3%
Milk yield (t/cow/year)	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.9%	0.2%
Farm structure										
No. of dairy farms (in 1,000's)	50,481	51,643	56,833	62,024	67,214	72,405	75,236	77,889	3.1%	1.8%
Average farm size (cows/farm)	2.0	2.0	1.8	1.7	1.6	1.6	1.6	1.6	-1.5%	0.4%
Prices in national currency										
Milk : feed price ratio	1.4	1.6	1.3	1.5	1.3	1.6	1.2	1.5	0.5%	-2.1%
Cull cow (INR / kg live weight)	11	11	12	12	13	14	21	26	6.6%	17.4%
Land - buy (1,000 INR / ha)	700	715	750	800	850	917	1,056	1,326	4.7%	9.7%

Farm structure

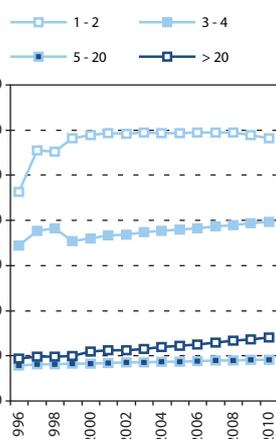
% of dairy farms and cows in size classes (2004)



* size class where IFCN typical farms are

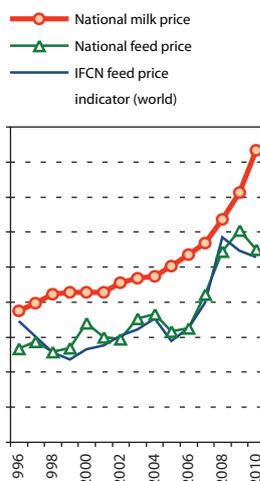
Farm structure

cows per herd size (in 1,000's)



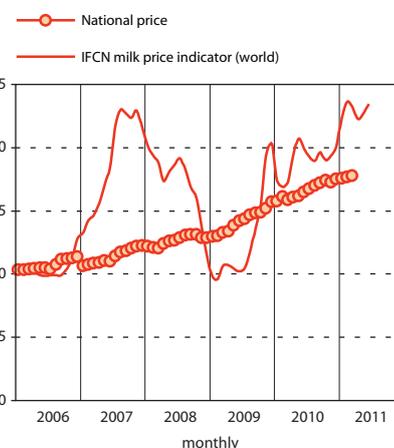
Milk and feed price

1,000 INR / 100 kg



Farm gate milk prices

1,000 INR / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, milk production.

Estimates done for: Milk price 2007-2010 based on index to consumer price for milk. Cow and buffalo numbers 1996, 2008-2010.

Dairy farm numbers based on census 1997 and 2007. Feed price 2010. Land price 2007-2010. Farm structure data based on the Dairy Report 2005.

Remarks: Cull cow price: Selling price of unproductive buffalos. Cull cow and land price: Average prices based on typical farms.

3.44 Indonesia – Milk production fact sheet

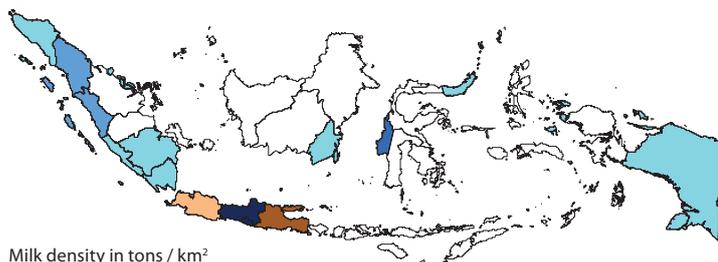


Istiqomah

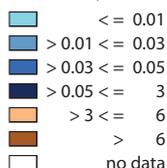


Milk density 2009

in tons / km²



Milk density in tons / km²



Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.44	0.37	0.49	0.49	0.55	0.61	0.64	0.92	5.5%	10.8%
Cows (in 1,000's)	334	322	354	358	364	369	458	495	2.8%	7.6%
Milk yield (t/cow/year)	1.3	1.2	1.4	1.4	1.5	1.7	1.4	1.9	2.5%	2.9%
Farm structure										
No. of dairy farms (in 1,000's)	104	108	113	117	121	125	129	133	1.8%	1.6%
Average farm size (cows/farm)	3.2	3.0	3.1	3.1	3.0	3.0	3.5	3.7	1.0%	5.9%
Prices in national currency										
Milk : feed price ratio	1.0	0.6	1.0	1.0	0.8	0.9	1.3	1.2	1.1%	8.0%
Cull cow (IDR / kg live weight)			15,170	20,511	21,471	27,328	33,832	42,311		11.5%
Land - buy (1,000 IDR / ha)							300,000	330,372		

STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 0.9 mill t ECM (number 66 in the world)
- No. of dairy farms: 133,347
- Milk price: -14% to world market
- Feed price: 27% to world market

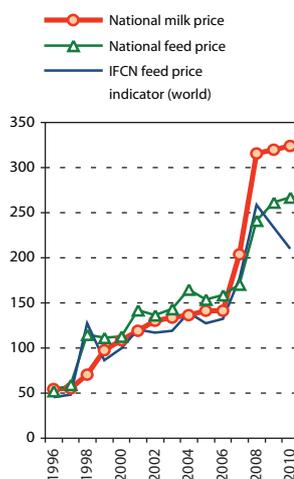
Key developments 2006-2010

- Milk production growth: +10.8% per year
- Share of time milk price was above world market level: 20%
- Milk price was on average -22% below the world market
- Share of time feed price was above world market level: 60%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%



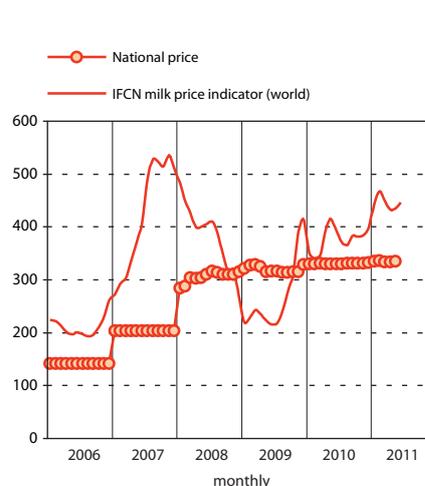
Milk and feed price

1,000 IDR / 100 kg



Farm gate milk prices

1,000 IDR / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, milk production.

Estimates done for: Dairy farm numbers 1996-2002 and 2004-2010 based on 1993 and 2003 census.

Land and cull cow prices 2009-2010.

Country supporter:
The participation
in the IFCN was
supported by Nestlé.





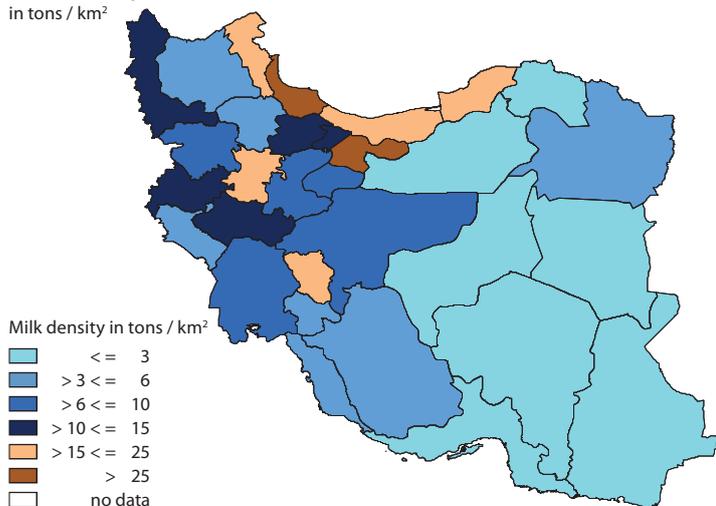


Massoumeh
Nasrollah Zadeh,
Farhad Mirzaei



Milk density 2009

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's and buffalo's): 10 mill t ECM (number 17 in the world)
- No. of dairy farms: 1,010,930
- Milk price: 25% to world market
- Feed price: 57% to world market

Key developments 2006-2010

- Milk production growth: +9% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 24% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 20%

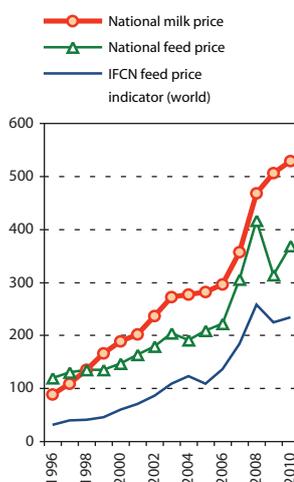
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's and buffalo's)										
Production (mill t)	3.99	4.29	5.01	5.23	6.11	7.10	8.07	10.04	6.8%	9.0%
Cows and buffalos (in 1,000's)	3,366	3,547	3,830	3,650	3,707	3,830	3,730	3,538	0.4%	-2.0%
Milk yield (t/cow/year)	1.2	1.2	1.3	1.4	1.6	1.9	2.2	2.8	6.4%	11.2%
Farm structure										
No. of dairy farms (in 1,000's)	1,122	1,182	1,277	1,217	1,236	1,197	1,130	1,011	-0.7%	-4.1%
Average farm size (cows/farm)	3.0	3.0	3.0	3.0	3.0	3.2	3.3	3.5	1.1%	2.3%
Prices in national currency										
Milk : feed price ratio	0.7	1.0	1.3	1.3	1.4	1.3	1.1	1.4	4.8%	1.9%
Cull cow (IRR / kg live weight)		3,859	5,009	7,319	9,443	11,755	15,779	23,240		18.6%
Land - buy (1,000 IRR / ha)										



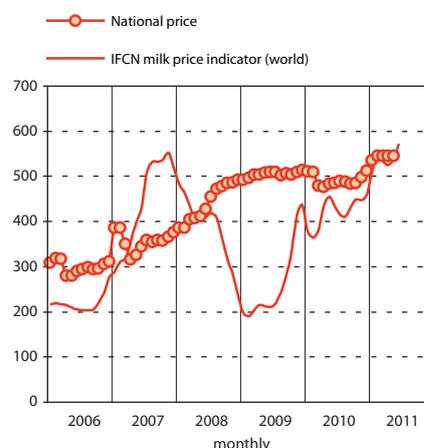
Milk and feed price

1,000 IRR / 100 kg



Farm gate milk prices

1,000 IRR / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, milk production.

Estimates done for: Milk cow numbers 2010. Buffalo numbers 2009-2010. Dairy farm numbers by IFCN based on the assumption that the average herd size is 3 - 3.5 cows / farm.

Remarks: Since no statistical information on feed prices have been available for 1996-2003 the world market price trends are used.



STATUS AND KEY DEVELOPMENTS

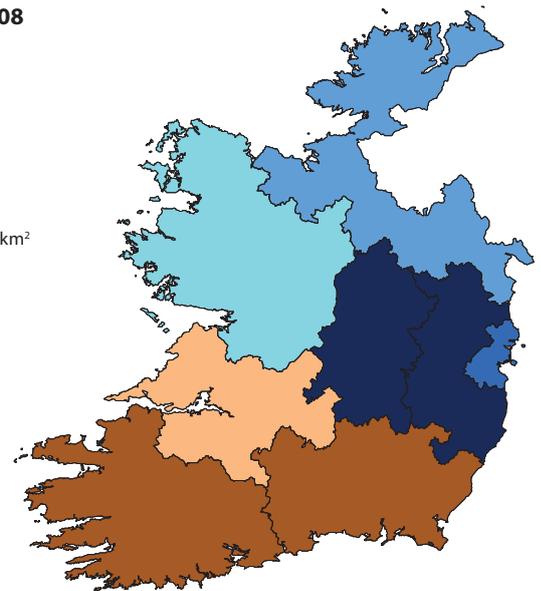
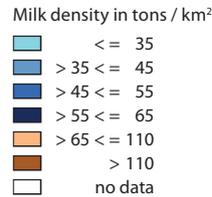
Status 2010

- Milk production (cow's): 5.3 mill t ECM (number 28 in the world)
- No. of dairy farms: 18,294
- Share of milk produced in farms with more than 50 cows: 95%
- Milk price: 0% to world market
- Feed price: 58% to world market

Key developments 2006-2010

- Milk production growth: +0.7% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 14% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

Milk density 2008
in tons / km²

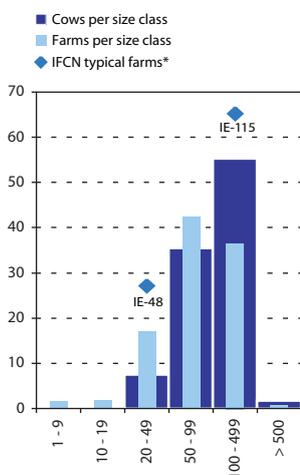


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	5.08	4.93	5.03	5.10	5.18	5.15	5.08	5.31	0.3%	0.7%
Cows (in 1,000's)	1,266	1,234	1,178	1,164	1,156	1,109	1,114	1,122	-0.9%	0.3%
Milk yield (t/cow/year)	4.0	4.0	4.3	4.4	4.5	4.6	4.6	4.7	1.2%	0.5%
Farm structure										
No. of dairy farms (in 1,000's)	41	37	32	27	24	22	20	18	-5.6%	-4.6%
Average farm size (cows/farm)	31	33	37	43	49	50	57	61	5.0%	5.1%
Prices in national currency										
Milk : feed price ratio	1.3	1.4	1.4	1.3	1.2	1.2	1.1	1.1	-1.2%	-1.0%
Cull cow (EUR / kg live weight)	0.83	0.73	0.74	0.62	0.76	0.87	1.02	0.92	0.7%	1.4%
Land - buy (EUR / ha)	6,769	8,961	12,816	13,574	16,258	20,000	16,720	8,800	1.9%	-18.6%
Quota (EUR / kg milk)	0.58	0.46	0.39	0.31	0.41	0.12	0.23	0.15	-9.3%	5.2%

Farm structure

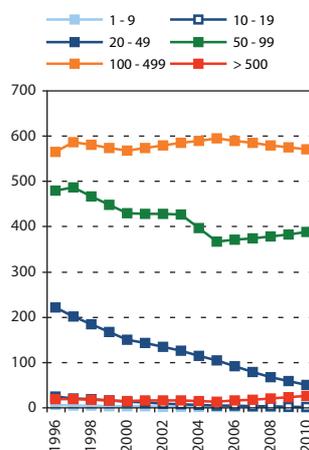
% of dairy farms and cows
in size classes (2007)



* size class where IFCN typical farms are

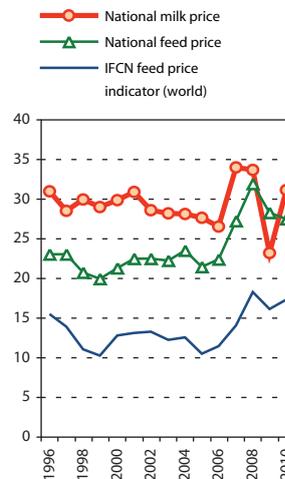
Farm structure

cows per herd size (in 1,000's)



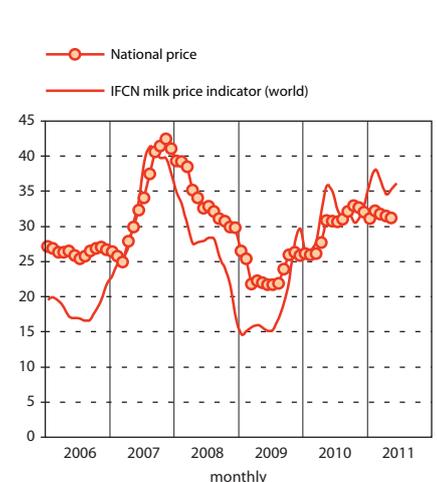
Milk and feed price

EUR / 100 kg



Farm gate milk prices

EUR / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2008, milk production.

Estimates done for: Farm structure: Cow number 2008-2010 following the trend. Quota price 2009-2010.

3.47 Israel – Milk production fact sheet



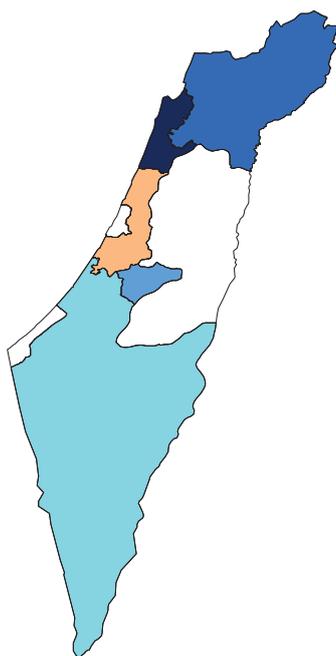
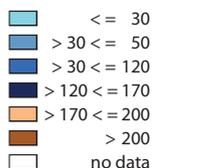
Liron Tamir



Milk density 2010

in tons / km²

Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 1.2 mill t ECM (number 63 in the world)
- No. of dairy farms: 951
- Share of milk produced in farms with more than 50 cows: 89%
- Milk price: 26% to world market
- Feed price: 47% to world market

Key developments 2006-2010

- Milk production growth: +2.9% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 40% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

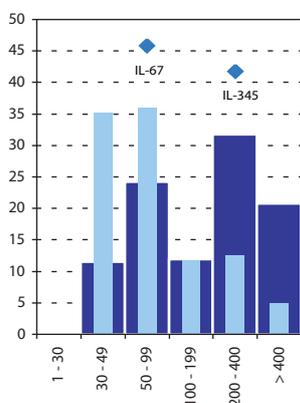
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.98	1.03	1.05	1.09	1.10	1.08	1.24	1.21	1.5%	2.9%
Cows (in 1,000's)	132	122	120	115	110	106	122	119	-0.7%	2.9%
Milk yield (t/cow/year)	7.4	8.4	8.7	9.5	10.0	10.2	10.1	10.2	2.3%	0.0%
Farm structure										
No. of dairy farms (in 1,000's)	1.48	1.45	1.32	1.18	1.08	1.03	0.99	0.95	-3.1%	-1.9%
Average farm size (cows/farm)	89	84	91	98	102	103	123	125	2.5%	4.9%
Prices in national currency										
Milk : feed price ratio	2.1	2.5	2.9	2.1	1.7	1.9	1.5	1.5	-2.1%	-5.5%
Cull cow (ILS / kg live weight)			4.13	3.54	4.82	6.98	7.35	8.76		5.9%
Land - buy (ILS / ha)										
Quota (ILS / kg milk)	1.00	1.18	1.40	1.37	1.25	1.25	2.00	2.80	7.6%	22.3%

Farm structure

% of dairy farms and cows in size classes (2010)

■ Cows per size class
■ Farms per size class
◆ IFCN typical farms*

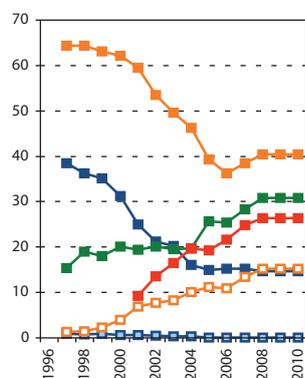


* size class where IFCN typical farms are

Farm structure

cows per herd size (in 1,000's)

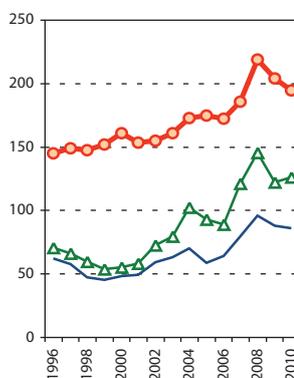
■ 1 - 30 ■ 30 - 49
■ 50 - 99 ■ 100 - 199
■ 200 - 400 ■ > 400



Milk and feed price

ILS / 100 kg

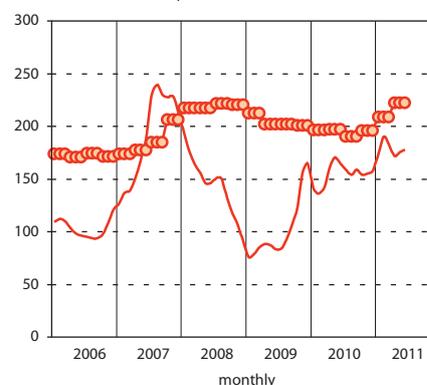
● National milk price
▲ National feed price
— IFCN feed price indicator (world)



Farm gate milk prices

ILS / 100 kg milk (ECM)

● National price
— IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.





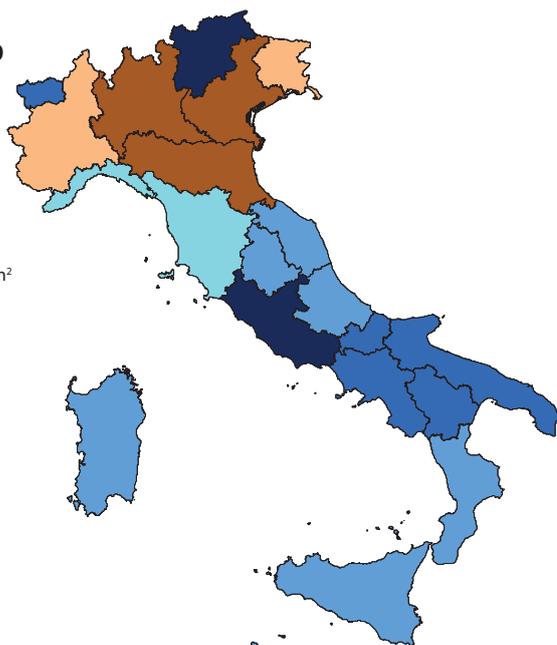
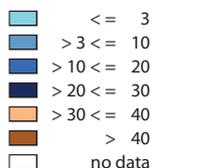
Alberto Menghi



Milk density 2010

in tons / km²

Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 10.9 mill t ECM (number 13 in the world)
- No. of dairy farms: 52,000
- Share of milk produced in farms with more than 50 cows: 78%
- Milk price: 17% to world market
- Feed price: 26% to world market

Key developments 2006-2010

- Milk production growth: +0.7% per year
- Share of time milk price was above world market level: 100%
- Milk price was on average 39% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 80%

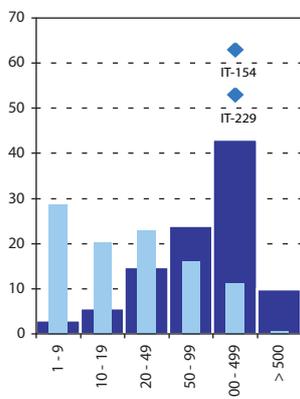
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	10.16	10.97	10.39	10.28	10.52	10.66	10.97	10.94	0.5%	0.7%
Cows (in 1,000's)	2,070	2,116	2,172	1,911	1,838	1,821	1,831	1,820	-0.9%	0.0%
Milk yield (t/cow/year)	4.9	5.2	4.8	5.4	5.7	5.9	6.0	6.0	1.5%	0.7%
Farm structure										
No. of dairy farms (in 1,000's)	109	96	82	72	64	62	58	52	-5.2%	-4.3%
Average farm size (cows/farm)	19	22	27	26	29	29	32	35	4.5%	4.4%
Prices in national currency										
Milk : feed price ratio	2.2	2.1	2.0	2.3	1.8	2.1	1.5	1.7	-1.8%	-5.1%
Cull cow (EUR / kg live weight)	0.67	0.85	0.84	0.66	0.88	0.69	0.80	0.95	2.5%	8.3%
Land - buy (EUR / ha)	33,570	38,734	45,190	50,000	57,100	58,000	67,000	68,000	5.2%	4.1%
Quota (EUR / kg milk)		0.57	0.66	0.56	0.62	0.52	0.30	0.13		-29.3%

Farm structure

% of dairy farms and cows in size classes (2007)

■ Cows per size class
■ Farms per size class
◆ IFCN typical farms*

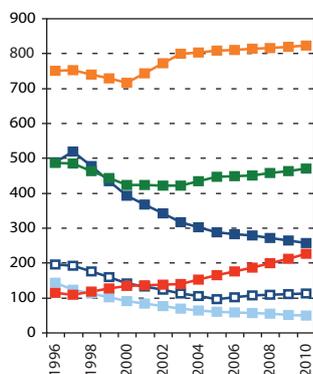


* size class where IFCN typical farms are

Farm structure

cows per herd size (in 1,000's)

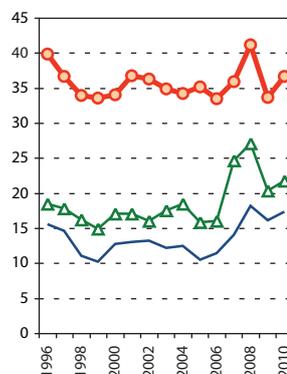
■ 1 - 9 ■ 10 - 19
■ 20 - 49 ■ 50 - 99
■ 100 - 499 ■ > 500



Milk and feed price

EUR / 100 kg

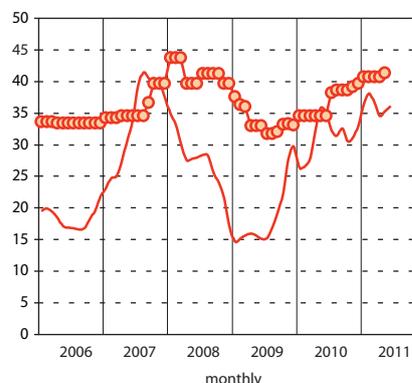
○ National milk price
△ National feed price
— IFCN feed price indicator (world)



Farm gate milk prices

EUR / 100 kg milk (ECM)

○ National price
— IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk delivered.

Estimates done for: Farm structure: Cow number 2008-2010 following the trend. Milk production 2010 based on monthly data.



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 0.014 mill t ECM (number 117 in the world)
- No. of dairy farms: 254 (2004)
- Share of milk produced in farms with more than 100 cows: 67% (2004)
- Milk price: 23% to world market
- Feed price: 0% to world market

Key developments 2006-2010

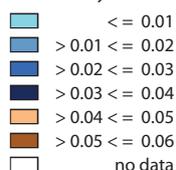
- Milk production growth: -2.5% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 33% above the world market
- Share of time feed price was above world market level: 0%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

Milk density 2010

in tons / km²



Milk density in tons / km²

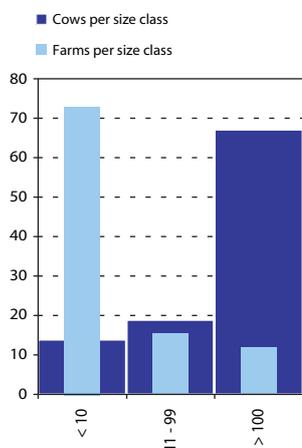


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.03	0.03	0.03	0.02	0.02	0.01	0.01	0.01	-4.8%	-2.5%
Cows (in 1,000's)	27	28	27	22	16	15	15	15	-4.2%	-0.8%
Milk yield (t/cow/year)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	-0.6%	-1.7%
Farm structure										
No. of dairy farms (in 1,000's)					0.254					
Average farm size (cows/farm)					63					
Prices in national currency										
Milk : feed price ratio	1.1	1.9	4.3	2.9	2.2	2.7	2.0	2.2	5.2%	-4.6%
Cull cow (JMD / kg live weight)										
Land - buy (1,000 JMD / ha)										

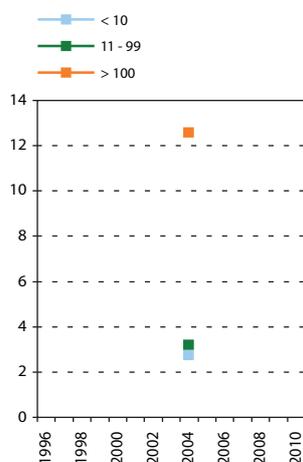
Farm structure

% of dairy farms and cows in size classes (2004)



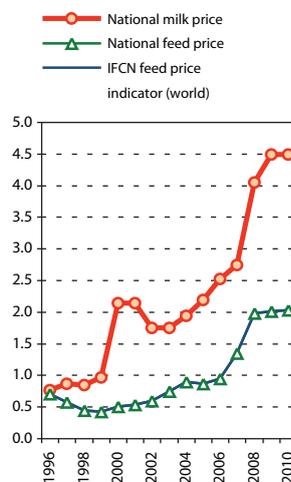
Farm structure

cows per herd size (in 1,000's)



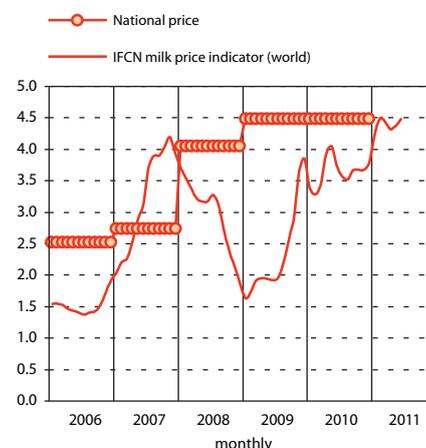
Milk and feed price

1,000 JMD / 100 kg



Farm gate milk prices

1,000 JMD / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Milk production and milk price 2010. Monthly milk prices: annual prices.

Remarks: Since no statistical information on soybean meal and corn prices are available the world market price is used.

3.50 Japan – Milk production fact sheet

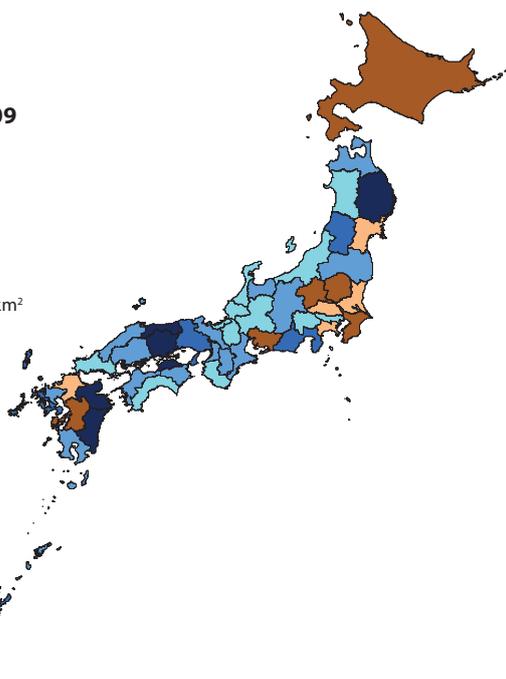
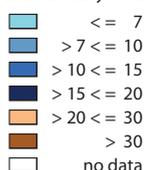


Kenji Namiki

Milk density 2009

in tons / km²

Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 7.6 mill t ECM (number 22 in the world)
- No. of dairy farms: 21,900
- Share of milk produced in farms with more than 50 cows: 68%
- Milk price: 148% to world market
- Feed price: 165% to world market

Key developments 2006-2010

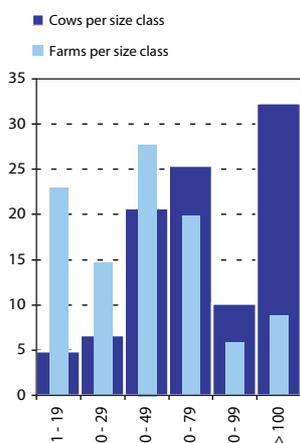
- Milk production growth: -1.5% per year
- Share of time milk price was above world market level: 100%
- Milk price was on average 121% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 60%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	8.47	8.39	8.32	8.33	8.29	8.11	7.92	7.62	-0.8%	-1.5%
Cows (in 1,000's)	1,211	1,190	1,150	1,126	1,088	1,046	998	964	-1.6%	-2.0%
Milk yield (t/cow/year)	7.0	7.0	7.2	7.4	7.6	7.7	7.9	7.9	0.9%	0.5%
Farm structure										
No. of dairy farms (in 1,000's)	42	37	34	31	29	27	24	22	-4.5%	-4.7%
Average farm size (cows/farm)	29	32	34	36	38	39	41	44	3.0%	2.9%
Prices in national currency										
Milk : feed price ratio	1.8	1.8	2.1	1.9	1.7	1.7	1.2	1.7	-0.3%	-0.7%
Cull cow (JPY / kg live weight)	154	146	142	72	185	190	193	156	0.1%	-4.8%
Land - buy (1,000 JPY / ha)	13,410	12,670	12,100	11,710	10,980	10,360	10,282	10,040	-2.0%	-0.8%

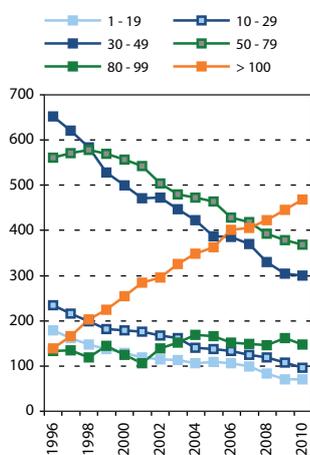
Farm structure

% of dairy farms and cows in size classes (2010)



Farm structure

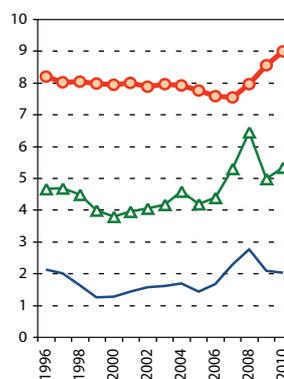
cows per herd size (in 1,000's)



Milk and feed price

1,000 JPY / 100 kg

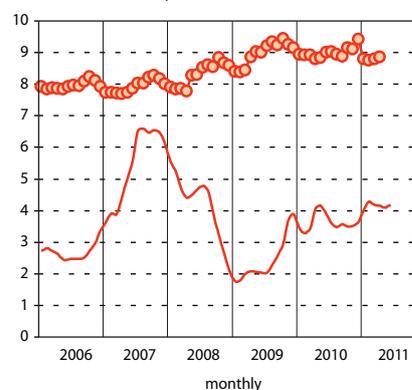
Legend:
 - National milk price (red circle)
 - National feed price (green triangle)
 - IFCN feed price indicator (world) (blue line)



Farm gate milk prices

1,000 JPY / 100 kg milk (ECM)

Legend:
 - National price (red circle)
 - IFCN milk price indicator (world) (red line)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, milk production.

Estimates done for: Land price 2008-2010.

Remarks: Farm structure: The cow numbers include all cows older than two years.





STATUS AND KEY DEVELOPMENTS

Status 2010

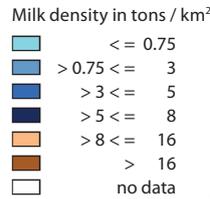
- Milk production (cow's): 0.3 mill t ECM (number 101 in the world)
- No. of dairy farms: 850
- Share of milk produced in farms with more than 50 cows: 53%
- Milk price: 53% to world market
- Feed price: 73% to world market

Key developments 2006-2010

- Milk production growth: +5.2% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 57% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 80%

Milk density 2008

in tons / km²

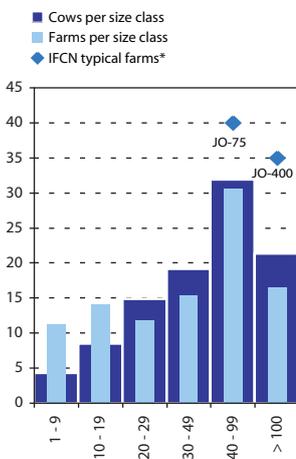


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.11	0.12	0.16	0.18	0.17	0.21	0.19	0.25	6.4%	5.2%
Cows (in 1,000's)	36	38	47	39	43	50	43	47	1.9%	-1.5%
Milk yield (t/cow/year)	2.9	3.2	3.4	4.5	3.9	4.1	4.4	5.4	4.4%	6.9%
Farm structure										
No. of dairy farms (in 1,000's)	0.82	0.86	0.86	0.86	0.72	0.67	0.60	0.64	0.2%	6.1%
Average farm size (cows/farm)	44	44	55	46	60	75	72	73	1.7%	-7.2%
Prices in national currency										
Milk : feed price ratio	1.8	2.0	1.7	1.7	1.8	2.0	1.7	1.6	-0.7%	-5.9%
Cull cow (JOD / kg live weight)					1.60	1.70	1.90	2.30		7.8%
Land - buy (JOD / ha)				15,000	25,000	60,000	60,000	100,000		13.6%

Farm structure

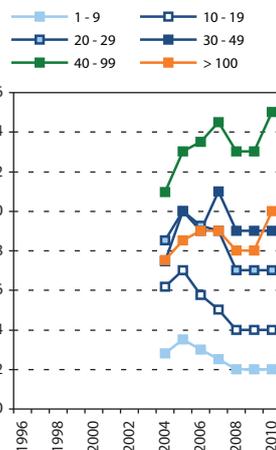
% of dairy farms and cows in size classes (2010)



* size class where IFCN typical farms are

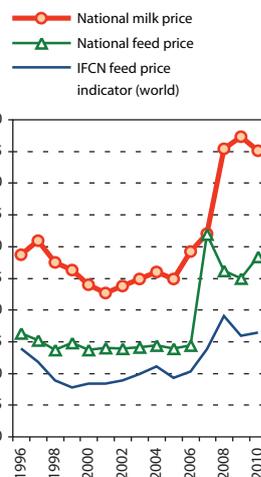
Farm structure

cows per herd size (in 1,000's)



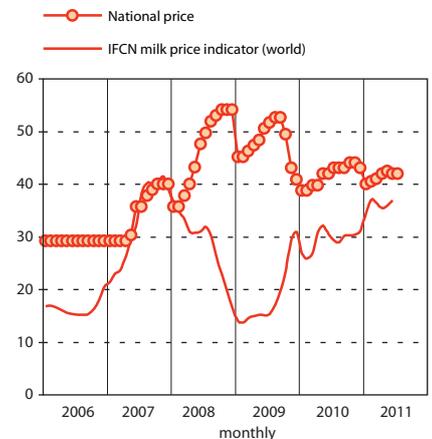
Milk and feed price

JOD / 100 kg



Farm gate milk prices

JOD / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2008, milk production.

Estimates done for: Monthly milk price 2011. Farm structure information 2009-2010.

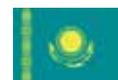
Country supporter: The participation in IFCN was supported via DAAD research support.

DAAD Deutscher Akademischer Austausch Dienst
German Academic Exchange Service

3.52 Kazakhstan – Milk production fact sheet

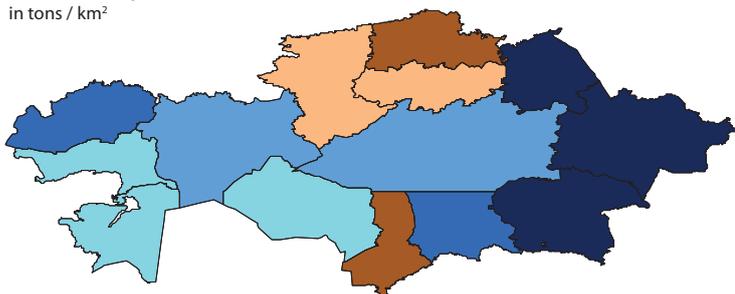


Galiya Akimbekova

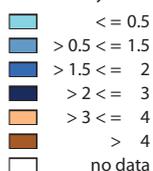


Milk density 2010

in tons / km²



Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 5 mill t ECM (number 32 in the world)
- No. of dairy farms: 880,000
- Share of milk produced in agricultural enterprises: 4%
- Milk price: 21% to world market
- Feed price: -10% to world market

Key developments 2006-2010

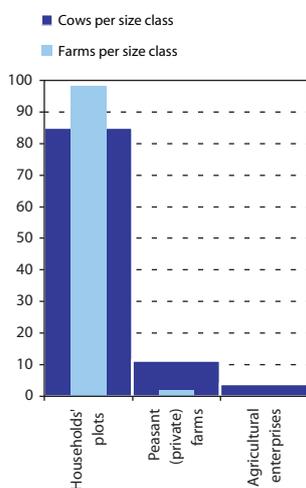
- Milk production growth: +1.9% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average -2% below the world market
- Share of time feed price was above world market level: 0%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	3.41	2.85	3.51	3.76	4.22	4.60	4.79	4.95	2.7%	1.9%
Cows (in 1,000's)	2,547	1,953	2,015	2,171	2,399	2,555	2,675	2,779	0.6%	2.1%
Milk yield (t/cow/year)	1.3	1.5	1.7	1.7	1.8	1.8	1.8	1.8	2.1%	-0.2%
Farm structure										
No. of dairy farms (in 1,000's)			618	664	718	753	878	880		4.0%
Average farm size (cows/farm)			3.3	3.3	3.3	3.4	3.0	3.2		-1.8%
Prices in national currency										
Milk : feed price ratio	1.0	2.4	1.6	1.7	1.6	2.3	1.6	2.4	6.3%	1.0%
Cull cow (KZT / kg live weight)										
Land - buy (1,000 KZT / ha)										

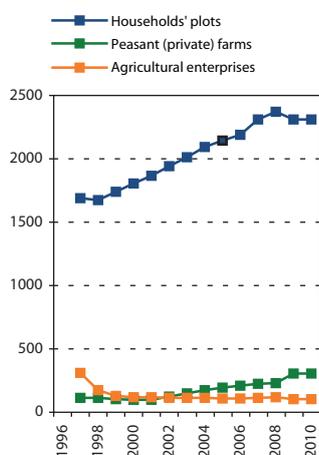
Farm structure

% of dairy farms and cows in size classes (2010)



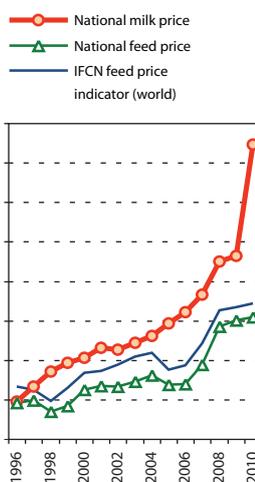
Farm structure

cows per herd size (in 1,000's)



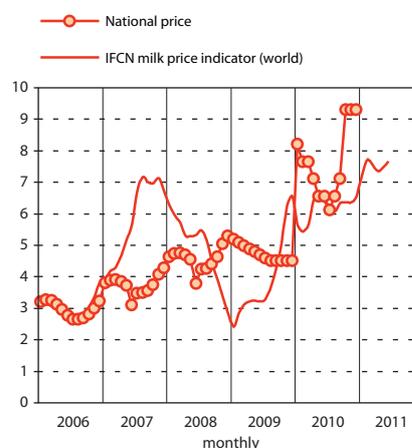
Milk and feed price

1,000 KZT / 100 kg



Farm gate milk prices

1,000 KZT / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Corn price: trend of world corn price used for the years 2006-2008.

Remarks: Since no statistical information on soybean meal prices are available the world market price is used.



STATUS AND KEY DEVELOPMENTS

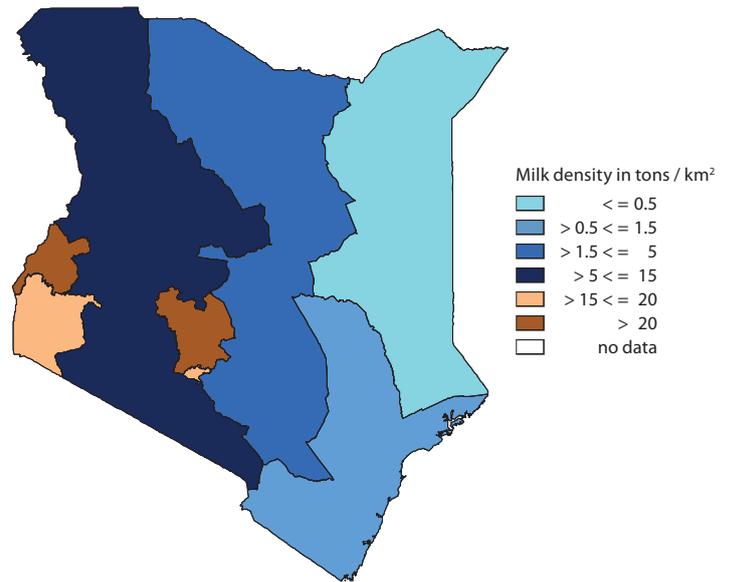
Status 2010

- Milk production (cow's): 3.9 mill t ECM (number 34 in the world)
- No. of dairy farms: 1,725,000
- Milk price: -35% to world market
- Feed price: -2% to world market

Key developments 2006-2010

- Milk production growth: +2.8% per year
- Share of time milk price was above world market level: 40%
- Milk price was on average -18% below the world market
- Share of time feed price was above world market level: 0%
- Share of time milk : feed price ratio was above 1.5 (favourable): 40%

Milk density 2008
in tons / km²

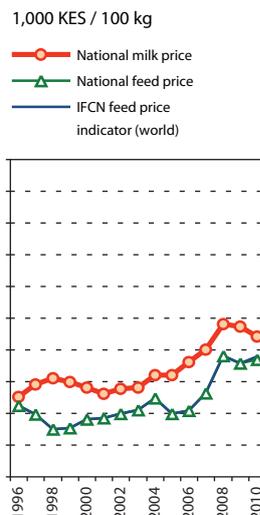


Key variables

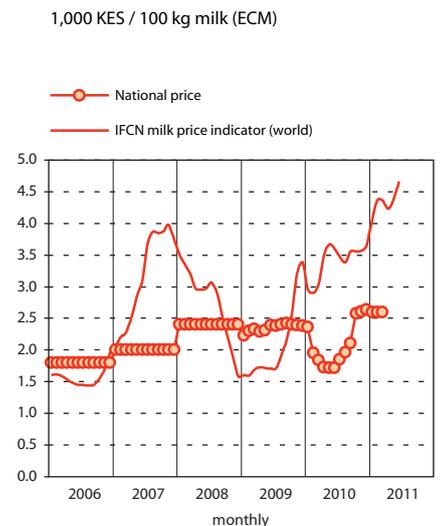
	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	1.91	2.01	2.22	2.81	2.83	3.50	3.99	3.91	5.2%	2.8%
Cows (in 1,000's)	4,550	4,420	4,690	4,000	5,500	6,200	7,200	6,964	3.1%	2.9%
Milk yield (t/cow/year)	0.4	0.5	0.5	0.7	0.5	0.6	0.6	0.6	2.1%	-0.2%
Farm structure										
No. of dairy farms (in 1,000's)	623	623	623	623	1,094	1,565	1,850	1,725	7.5%	2.5%
Average farm size (cows/farm)	7.3	7.1	7.5	6.4	5.0	4.0	3.9	4.0	-4.1%	0.5%
Prices in national currency										
Milk : feed price ratio	1.1	2.1	1.6	1.4	1.3	1.7	1.3	1.2	0.5%	-8.8%
Cull cow (KES / kg live weight)								150		
Land - buy (1,000 KES / ha)								1,750		



Milk and feed price



Farm gate milk prices



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2008, milk production.

Estimates done for: Cow numbers 2009-2010. Monthly milk price 2006-2008: annual averages.

Remarks: Since no statistical information on soybean meal and corn prices 1996-2009 are available the world market prices are used.

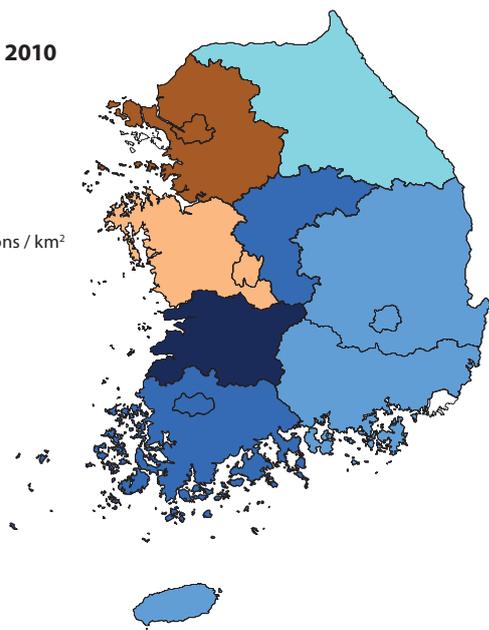
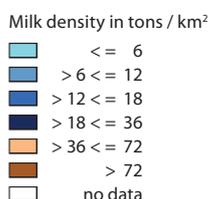


Kim Wontae



Milk density 2010

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 2 mill t ECM (number 47 in the world)
- No. of dairy farms: 6,347
- Share of milk produced in farms with more than 50 cows: 83%
- Milk price: 60% to world market
- Feed price: -3% to world market

Key developments 2006-2010

- Milk production growth: -2.2% per year
- Share of time milk price was above world market level: 100%
- Milk price was on average 95% above the world market
- Share of time feed price was above world market level: 60%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

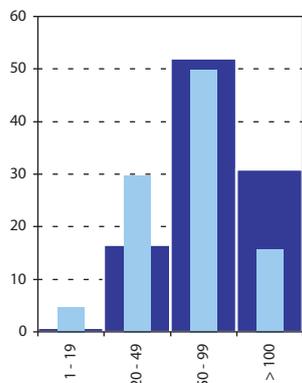
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	1.95	1.92	2.19	2.50	2.22	2.22	2.10	2.03	0.3%	-2.2%
Cows (in 1,000's)	551	539	544	544	497	464	446	430	-1.8%	-1.9%
Milk yield (t/cow/year)	3.5	3.6	4.0	4.6	4.5	4.8	4.7	4.7	2.1%	-0.3%
Farm structure										
No. of dairy farms (in 1,000's)	21	16	13	12	10	8	7	6	-8.2%	-6.4%
Average farm size (cows/farm)	26	34	41	46	52	56	64	68	7.1%	4.8%
Prices in national currency										
Milk : feed price ratio	2.9	2.6	4.3	3.9	2.8	4.1	1.7	3.0	0.2%	-7.9%
Cull cow (KRW / kg live weight)	1,700	897	1,101	1,324	1,072	1,135	957	1,224	-2.3%	1.9%
Land - buy (1,000 KRW / ha)										
Quota (KRW / kg milk)							245	165		

Farm structure

% of dairy farms and cows in size classes (2010)

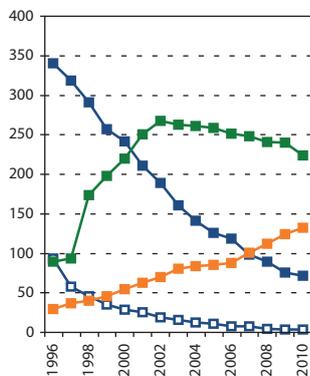
■ Cows per size class
■ Farms per size class



Farm structure

cows per herd size (in 1,000's)

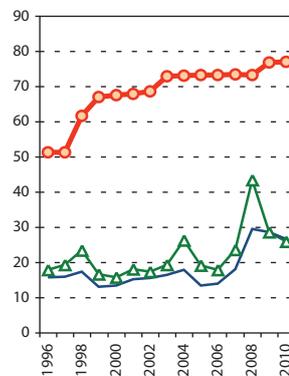
■ 1 - 19 ■ 20 - 49
■ 50 - 99 ■ > 100



Milk and feed price

1,000 KRW / 100 kg

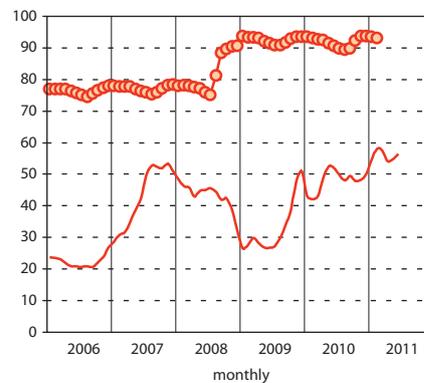
○ National milk price
△ National feed price
■ IFCN feed price indicator (world)



Farm gate milk prices

1,000 KRW / 100 kg milk (ECM)

○ National price
■ IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.





STATUS AND KEY DEVELOPMENTS

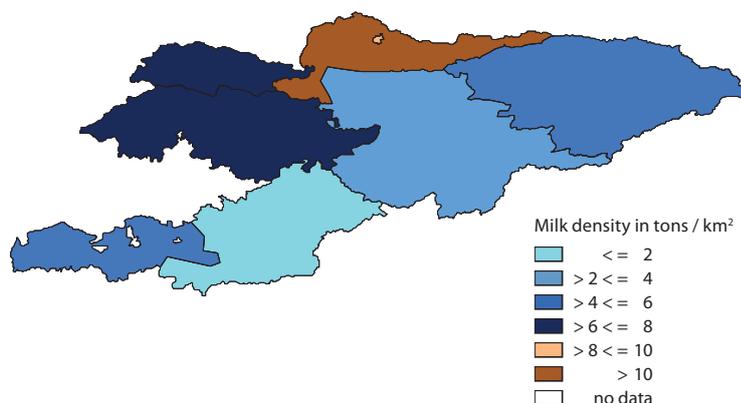
Status 2010

- Milk production (cow's): 1.3 mill t ECM (number 62 in the world)
- Share of milk produced in collective farms: 1%
- Milk price: -26% to world market
- Feed price: 2% to world market
-

Key developments 2006-2010

- Milk production growth: +2.9% per year
- Share of time milk price was above world market level: 40%
- Milk price was on average -7% below the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 20%

Milk density 2009

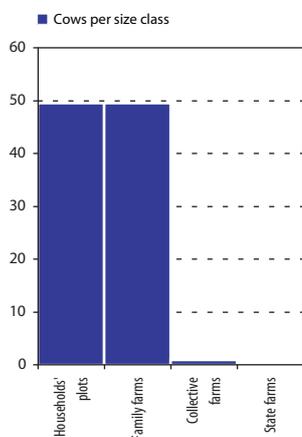
 in tons / km²


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.82	0.90	1.03	1.09	1.10	1.12	1.18	1.26	3.1%	2.9%
Cows (in 1,000's)	471	474	512	536	534	565	607	664	2.5%	4.1%
Milk yield (t/cow/year)	1.7	1.9	2.0	2.0	2.1	2.0	1.9	1.9	0.6%	-1.2%
Farm structure										
No. of dairy farms (in 1,000's)	314	316	341	357	356	377	405	443	2.5%	4.1%
Average farm size (cows/farm)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0.0%	0.0%
Prices in national currency										
Milk : feed price ratio		1.1	0.6	0.8	0.9	1.2	1.2	1.3		2.0%
Cull cow (KGS / kg live weight)										
Land - buy (KGS / ha)										

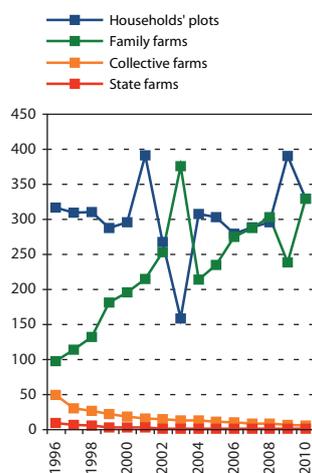
Farm structure

% of dairy farms and cows in size classes (2010)



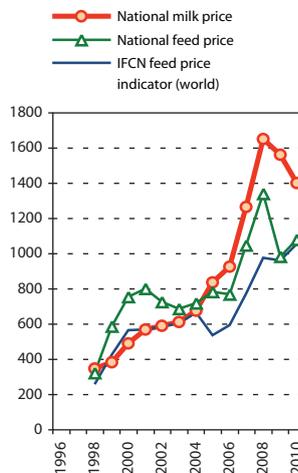
Farm structure

cows per herd size (in 1,000's)



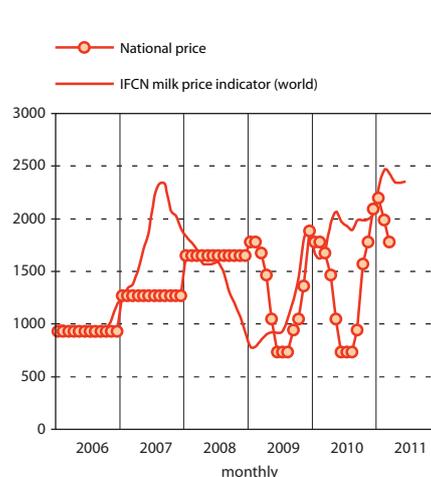
Milk and feed price

KGS / 100 kg



Farm gate milk prices

KGS / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, milk production.

Estimates done for: Farm structure: Cow number 2010 following the trend. Milk production 2010. Monthly milk prices 2006-2007: annual averages.

Estimated dairy farm number by IFCN via farm size assumption (1.5 cows per farm).

Remarks: Since no statistical information on soybean meal prices are available the world market price is used.

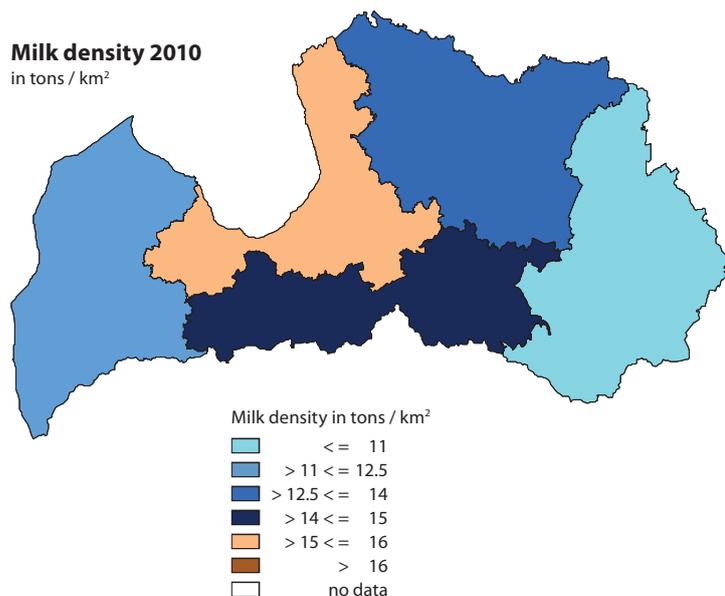


Agnese Krievina



Milk density 2010

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 0.9 mill t ECM (number 77 in the world)
- No. of dairy farms: 30,004
- Share of milk produced in farms with more than 50 cows: 37%
- Milk price: -23% to world market
- Feed price: 2% to world market

Key developments 2006-2010

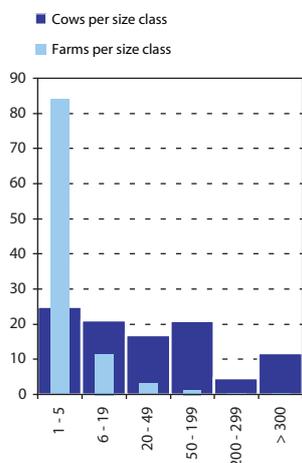
- Milk production growth: +0.7% per year
- Share of time milk price was above world market level: 20%
- Milk price was on average -11% below the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.91	0.94	0.82	0.81	0.80	0.84	0.86	0.86	-0.4%	0.7%
Cows (in 1,000's)	275	242	204	205	186	182	170	164	-3.6%	-2.6%
Milk yield (t/cow/year)	3.3	3.9	4.0	4.0	4.3	4.6	5.1	5.3	3.3%	3.4%
Farm structure										
No. of dairy farms (in 1,000's)	117	96	82	71	61	46	36	30	-9.2%	-10.1%
Average farm size (cows/farm)	2.4	2.5	2.5	2.9	3.0	4.0	4.8	5.5	6.2%	8.3%
Prices in national currency										
Milk : feed price ratio	0.9	1.0	0.8	1.0	1.3	1.5	1.2	1.4	2.8%	-2.0%
Cull cow (LVL / kg live weight)	0.42	0.40	0.33	0.42	0.35	0.51	0.60	0.54	1.8%	1.8%
Land - buy (LVL / ha)				300	700	2,600	1,360	690		-28.2%
Quota (LVL / kg milk)						0.04	0.05	0.03		-6.9%

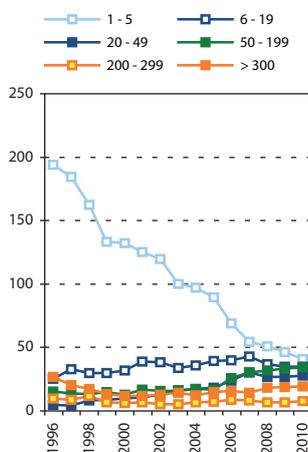
Farm structure

% of dairy farms and cows in size classes (2010)



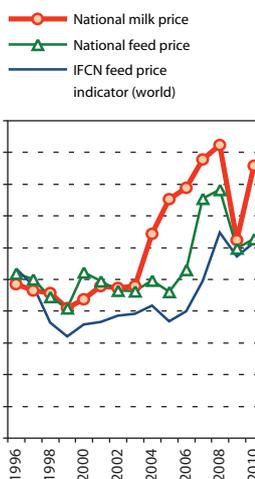
Farm structure

cows per herd size (in 1,000's)



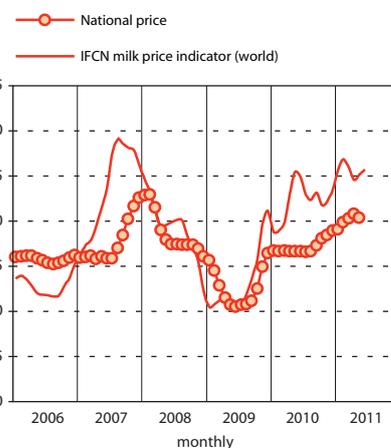
Milk and feed price

LVL / 100 kg



Farm gate milk prices

LVL / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.





Deiva Mikelionyte



STATUS AND KEY DEVELOPMENTS

Status 2010

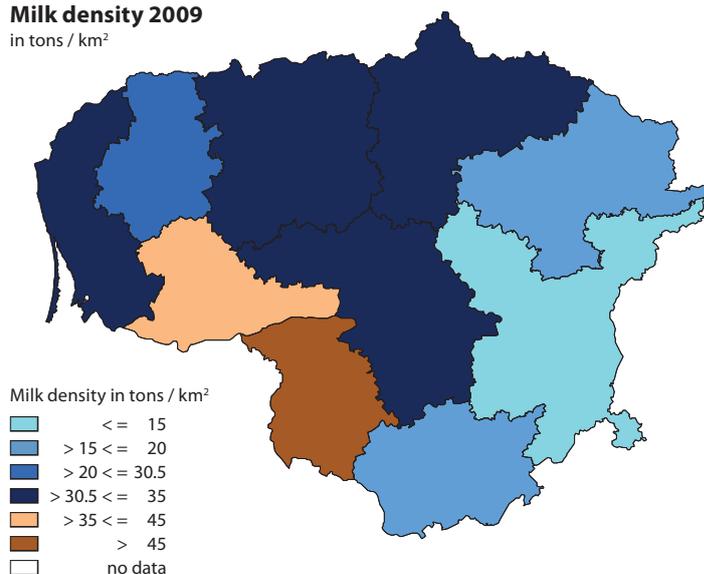
- Milk production (cow's): 1.8 mill t ECM (number 52 in the world)
- No. of dairy farms: 91,100
- Share of milk produced in farms with more than 30 cows: 40%
- Milk price: -27% to world market
- Feed price: -6% to world market

Key developments 2006-2010

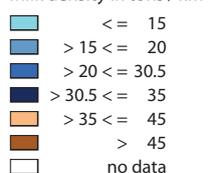
- Milk production growth: -1.8% per year
- Share of time milk price was above world market level: 20%
- Milk price was on average -21% below the world market
- Share of time feed price was above world market level: 40%
- Share of time milk : feed price ratio was above 1.5 (favourable): 20%

Milk density 2009

in tons / km²



Milk density in tons / km²

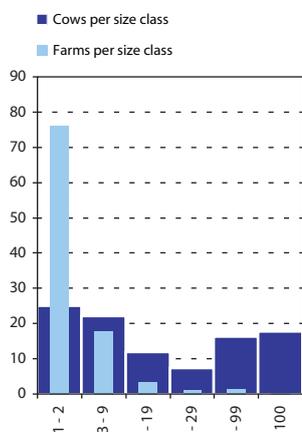


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	1.82	1.91	1.71	1.76	1.87	1.91	1.92	1.78	-0.2%	-1.8%
Cows (in 1,000's)	586	583	494	442	434	399	395	360	-3.4%	-2.5%
Milk yield (t/cow/year)	3.1	3.3	3.5	4.0	4.3	4.8	4.9	4.9	3.4%	0.7%
Farm structure										
No. of dairy farms (in 1,000's)		242	219	198	182	154	108	91		-12.2%
Average farm size (cows/farm)		2.4	2.3	2.2	2.4	2.6	3.7	4.0		11.0%
Prices in national currency										
Milk : feed price ratio	0.9	1.5	1.0	1.1	1.2	1.6	1.3	1.4	3.5%	-2.5%
Cull cow (LTL / kg live weight)					1.60	2.31	2.79	2.69		3.9%
Land - buy (LTL / ha)				1,531	1,045	3,426	7,991	3,576		1.1%
Quota (LTL / kg milk)							0.08	0.02		

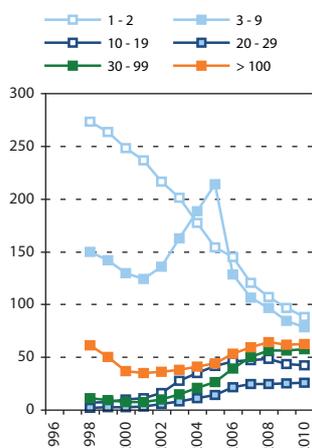
Farm structure

% of dairy farms and cows in size classes (2010)



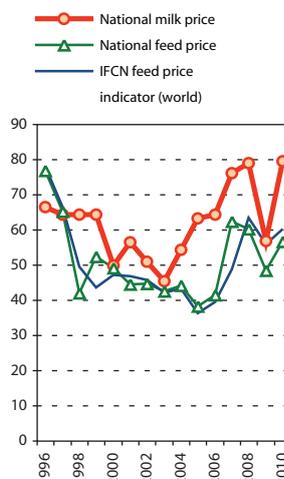
Farm structure

cows per herd size (in 1,000's)



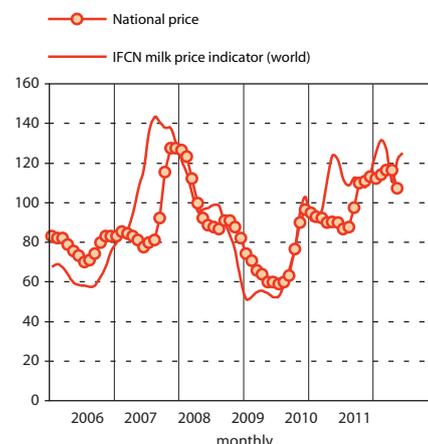
Milk and feed price

LTL / 100 kg



Farm gate milk prices

LTL / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, milk production.

Estimates done for: Land price 2010.

Remarks: Since no statistical information on soybean meal prices are available the world market price is used.



Simone Adam



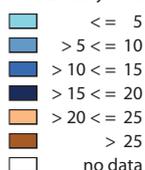
MINISTÈRE DE L'AGRICULTURE, DE LA VITICULTURE ET DU DÉVELOPPEMENT RURAL
Service d'économie rurale

Milk density 2010

in tons / km²



Milk density in tons / km²

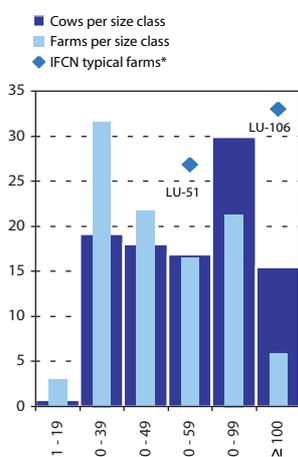


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.28	0.27	0.27	0.28	0.28	0.28	0.29	0.30	0.7%	2.4%
Cows (in 1,000's)	48	46	43	42	40	39	40	41	-1.1%	1.5%
Milk yield (t/cow/year)	5.7	6.0	6.3	6.6	6.9	7.2	7.2	7.4	1.9%	0.9%
Farm structure										
No. of dairy farms (in 1,000's)	1.34	1.26	1.16	1.07	0.99	0.93	0.86	0.81	-3.5%	-3.3%
Average farm size (cows/farm)	36	37	37	39	40	41	46	50	2.4%	5.0%
Prices in national currency										
Milk : feed price ratio	1.9	2.2	1.9	2.1	1.7	1.9	1.5	1.5	-1.6%	-6.1%
Cull cow (EUR / kg live weight)	1.32	1.37	1.33	1.18	1.34	1.58	1.63	1.63	1.5%	0.8%
Land - buy (EUR / ha)					15,449	16,077	17,853	20,465		6.2%
Quota (EUR / kg milk)			0.68	0.89	1.11	1.24	0.81	0.46		-22.0%

Farm structure

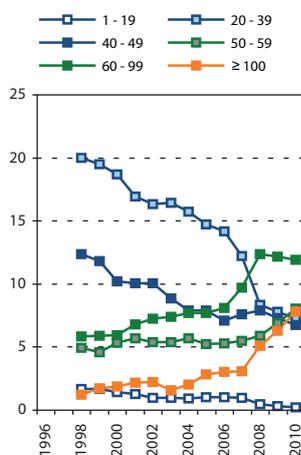
% of dairy farms and cows in size classes (2009)



* size class where IFCN typical farms are

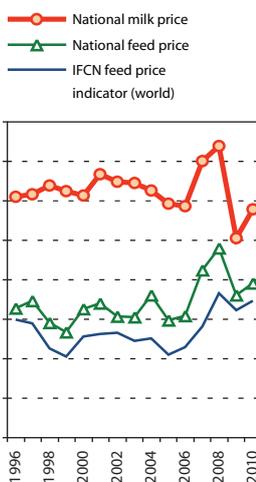
Farm structure

cows per herd size (in 1,000's)



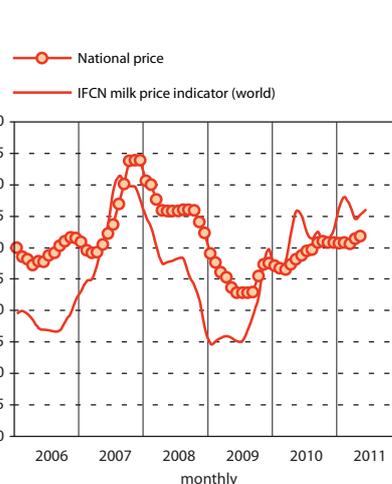
Milk and feed price

EUR / 100 kg



Farm gate milk prices

EUR / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Farm structure: Cow number 2010 following the trend. Land price 2010.





Blagica Sekovska



3.59 Macedonia – Milk production fact sheet

STATUS AND KEY DEVELOPMENTS

Status 2010

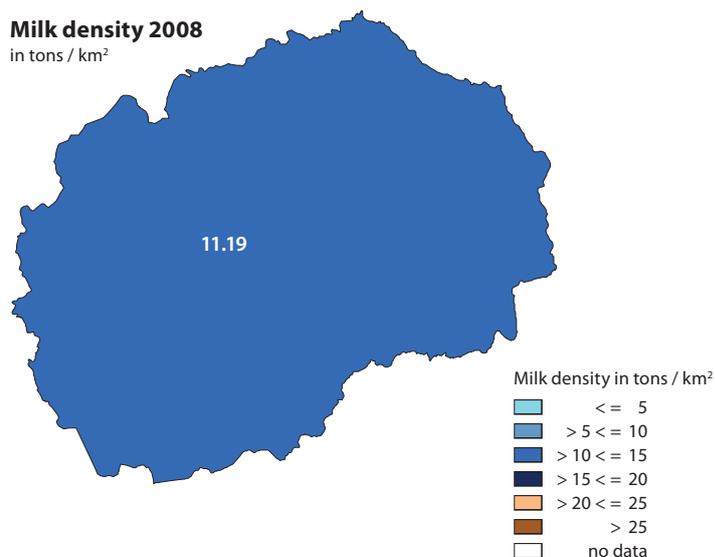
- Milk production (cow's): 0.3 mill t ECM (number 102 in the world)
- No. of dairy farms: 44,000
- Milk price: -10% to world market
- Feed price: 0% to world market

Key developments 2006-2010

- Milk production growth: +4.7% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average 15% above the world market
- Share of time feed price was above world market level: 20%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

Milk density 2008

in tons / km²



Key variables

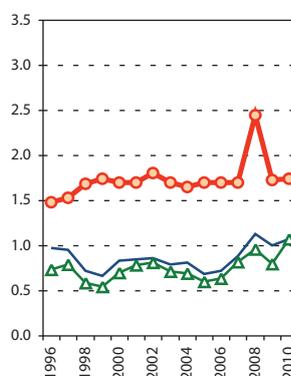
	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.13	0.17	0.22	0.20	0.21	0.23	0.27	0.28	5.5%	4.7%
Cows (in 1,000's)	95	91	95	95	90	94	130	95	0.0%	0.3%
Milk yield (t/cow/year)	1.4	1.9	2.3	2.1	2.3	2.5	2.1	2.9	5.5%	4.4%
Farm structure										
No. of dairy farms (in 1,000's)					41	41	42	44		1.5%
Average farm size (cows/farm)					2.2	2.3	3.1	2.2		-1.2%
Prices in national currency										
Milk : feed price ratio	2.0	2.9	2.4	2.2	2.4	2.7	2.6	1.6	-1.5%	-11.8%
Cull cow (MKD / kg live weight)							57	65		
Land - buy (1,000 MKD / ha)										



Milk and feed price

1,000 MKD / 100 kg

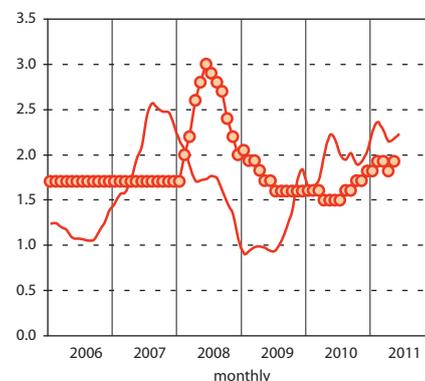
● National milk price
▲ National feed price
— IFCN feed price indicator (world)



Farm gate milk prices

1,000 MKD / 100 kg milk (ECM)

● National price
— IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2008, milk production.

Estimates done for: Number of cows in 2010. Monthly milk prices 2006-2007: annual averages.

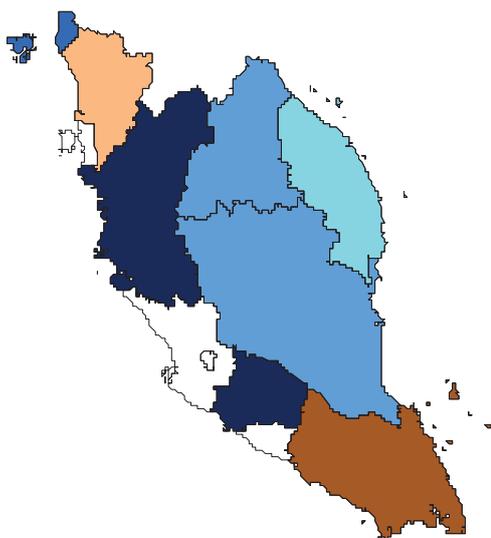
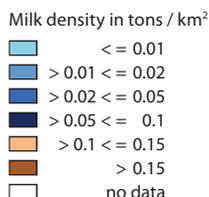
Remarks: Since no statistical information on soybean meal and barley prices are available 1996-2009 a differential to the world commodity prices is used.

3.60 Malaysia – Milk production fact sheet



Zakaria Abd Rahman Dairy Farmer

Milk density 2008 in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 0.1 mill t ECM (number 132 in the world)
- No. of dairy farms: 790
- Milk price: 50% to world market
- Feed price: 17% to world market

Key developments 2006-2010

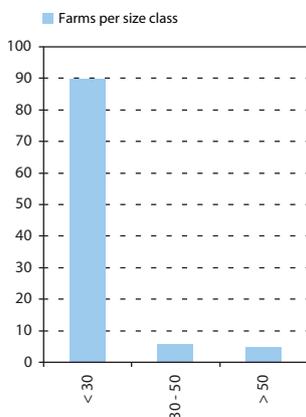
- Milk production growth: +10.1% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 45% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)				0.04	0.04	0.05	0.06	0.07		10.1%
Cows (in 1,000's)				28	28	28	24	35		5.7%
Milk yield (t/cow/year)				1.3	1.3	1.6	2.3	1.9		4.2%
Farm structure										
No. of dairy farms (in 1,000's)	0.60	0.60	0.60	0.50	0.50	0.50	0.52	0.79	2.0%	12.1%
Average farm size (cows/farm)				56	56	56	46	44		-5.7%
Prices in national currency										
Milk : feed price ratio	1.8	2.7	2.9	2.8	2.2	2.1	1.9	2.3	1.9%	2.1%
Cull cow (MYR / kg live weight)	4.50	4.50	4.50	4.50	5.50	5.50	6.00	7.50	3.7%	8.1%
Land - buy (MYR / ha)	20,000	20,000	25,000	25,000	35,000	40,000	40,000	45,000	6.0%	3.0%

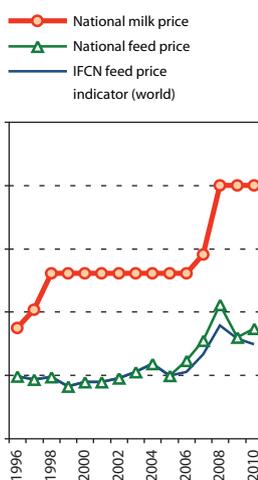
Farm structure

% of dairy farms and cows in size classes (2008)



Milk and feed price

MYR / 100 kg



Farm gate milk prices

MYR / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2008, milk production.

Remarks: Since no statistical information on corn price is available the world market price is used. Soybean meal price 1996-2005 is linked to world market price.



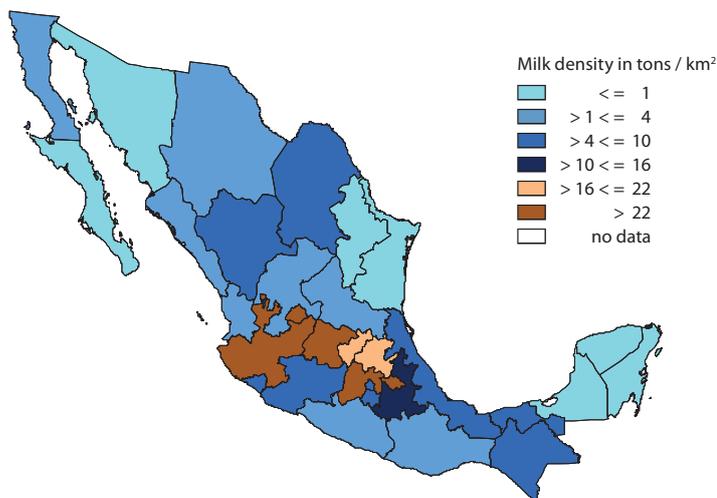


Jaime Jurado Arredondo



Milk density 2010

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 11.2 mill t ECM (number 16 in the world)
- No. of dairy farms: 133,671
- Milk price: -10% to world market
- Feed price: 36% to world market

Key developments 2006-2010

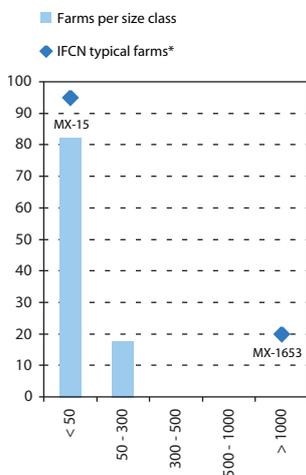
- Milk production growth: +1.8% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average 7% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 40%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	7.84	8.59	9.62	9.98	10.19	10.42	10.85	11.21	2.6%	1.8%
Cows (in 1,000's)	1,694	1,814	2,075	2,182	2,234	2,221	2,340	2,348	2.4%	1.4%
Milk yield (t/cow/year)	4.6	4.7	4.6	4.6	4.6	4.7	4.6	4.8	0.2%	0.4%
Farm structure										
No. of dairy farms (in 1,000's)	119	123	126	128	130	133	133	134	0.8%	0.1%
Average farm size (cows/farm)	14	15	16	17	17	17	18	18	1.5%	1.3%
Prices in national currency										
Milk : feed price ratio	1.5	2.0	2.1	2.0	1.8	2.2	1.4	1.2	-1.5%	-13.8%
Cull cow (MXN / kg live weight)	6.00	6.80	6.80	7.00	6.90	7.20	7.00	7.10	1.2%	-0.3%
Land - buy (MXN / ha)	25,000	25,000	27,000	28,000	29,000	30,000	30,000	35,000	2.4%	3.9%

Farm structure

% of dairy farms and cows in size classes (2010)

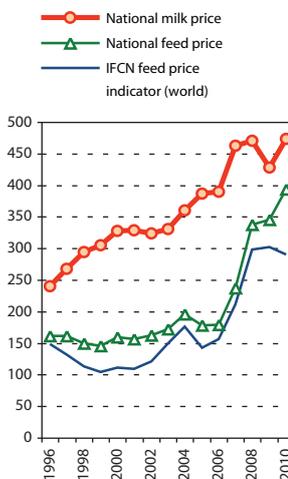


* size class where IFCN typical farms are



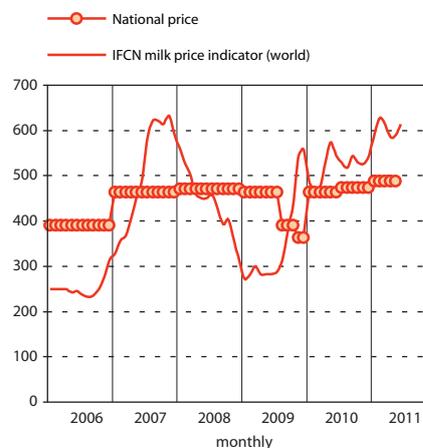
Milk and feed price

MXN / 100 kg



Farm gate milk prices

MXN / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Cow numbers 2010. Dairy farm numbers 2009-2010. Land price is estimated from land prices in different regions.

Remarks: Since no statistical information on soybean meal prices are available the world market price is used.

The dairy farm numbers represent the following regions: Guanajuato, Hidalgo, Jalisco, Michoacan, Puebla y Queretaro.





STATUS AND KEY DEVELOPMENTS

Status 2010

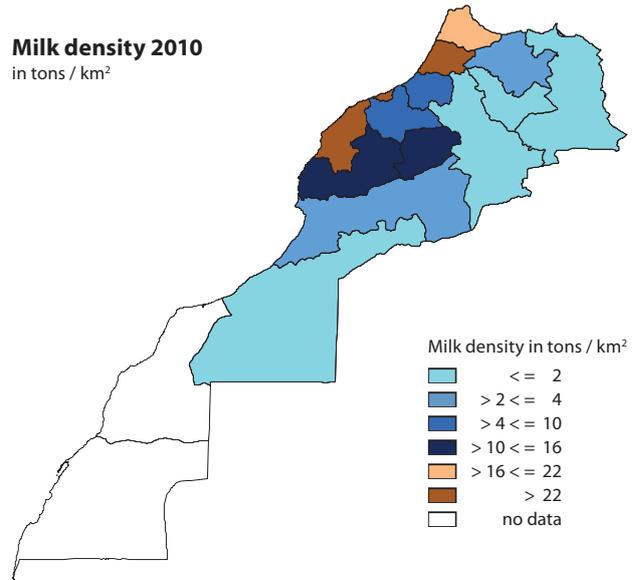
- Milk production (cow's): 2.2 mill t ECM (number 55 in the world)
- No. of dairy farms: 261,000
- Share of milk produced in farms with more than 10 cows: 1% (1996)
- Milk price: -1% to world market
- Feed price: 33% to world market

Key developments 2006-2010

- Milk production growth: +7.5% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average 17% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 60%

Milk density 2010

in tons / km²

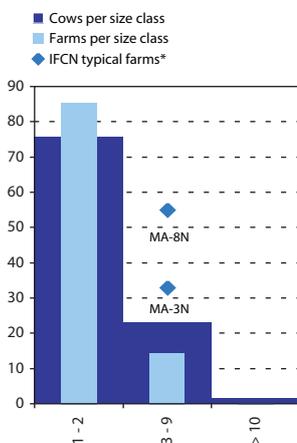


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.87	1.05	1.18	1.23	1.41	1.61	1.84	2.15	6.7%	7.5%
Cows (in 1,000's)	1,205	1,324	1,308	1,331	1,350	1,497	1,561	1,835	3.0%	5.2%
Milk yield (t/cow/year)	0.7	0.8	0.9	0.9	1.0	1.1	1.2	1.2	3.5%	2.2%
Farm structure										
No. of dairy farms (in 1,000's)	769	700	650	550	450	400	287	261	-7.4%	-10.1%
Average farm size (cows/farm)	1.6	1.9	2.0	2.4	3.0	3.7	5.4	7.0	11.3%	17.1%
Prices in national currency										
Milk : feed price ratio	1.8	1.8	1.5	1.5	1.6	1.6	1.2	1.3	-2.3%	-5.0%
Cull cow (MAD / kg live weight)							22	22		
Land - buy (MAD / ha)								350,000		

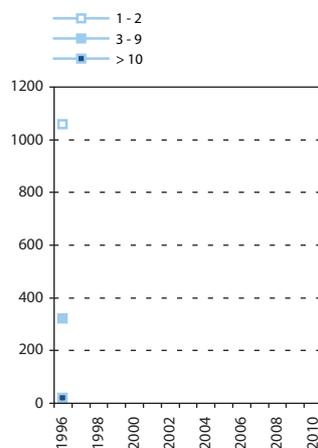
Farm structure

% of dairy farms and cows
in size classes (1996)



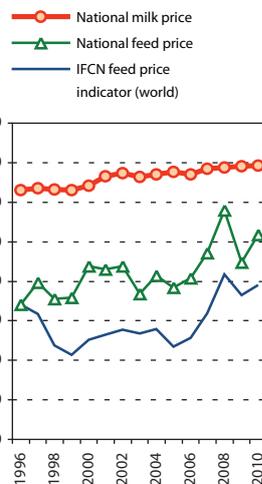
Farm structure

cows per herd size (in 1,000's)



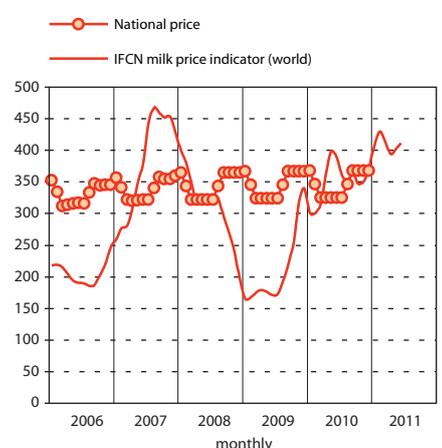
Milk and feed price

MAD / 100 kg



Farm gate milk prices

MAD / 100 kg milk (ECM)



* size class where IFCN typical farms are

Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Dairy farm numbers interpolated for the years 2000-2004 and 2008-2009. Barley price 2007-2010.

Remarks: Since no statistical information on soybean meal prices are available the world market price is used.



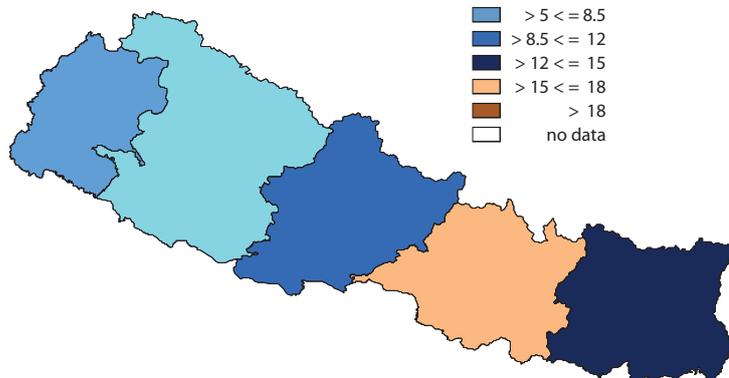
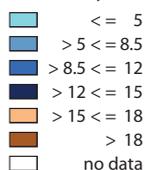
Romy Das

Agriculture Researcher

Milk density 2009

in tons / km²

Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's and buffalo's): 1.7 mill t ECM (number 50 in the world)
- Milk price: -11% to world market
- Feed price: 0% to world market

Key developments 2006-2010

- Milk production growth: +3.5% per year
- Share of time milk price was above world market level: 40%
- Milk price was on average -1% below the world market
- Share of time feed price was above world market level: 0%
- Share of time milk : feed price ratio was above 1.5 (favourable): 60%

Key variables

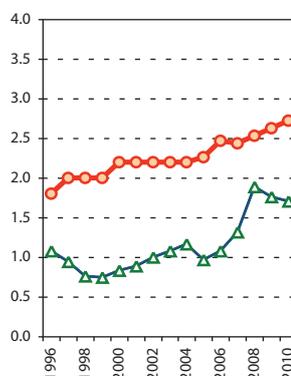
	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's and buffalo's)										
Production (mill t)	1.14	1.20	1.26	1.34	1.43	1.52	1.63	1.74	3.1%	3.5%
Cows and buffalos (in 1,000's)	1,674	1,725	1,789	1,859	1,953	2,033	2,144	2,272	2.2%	2.8%
Milk yield (t/cow/year)	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.9%	0.6%
Farm structure										
No. of dairy farms (in 1,000's)					376					
Average farm size (cows/farm)					5.2					
Prices in national currency										
Milk : feed price ratio	1.7	2.6	2.6	2.2	1.9	2.3	1.3	1.6	-0.3%	-8.6%
Cull cow (NPR / kg live weight)										
Land - buy (1,000 NPR / ha)							2007: 35.6			



Milk and feed price

1,000 NPR / 100 kg

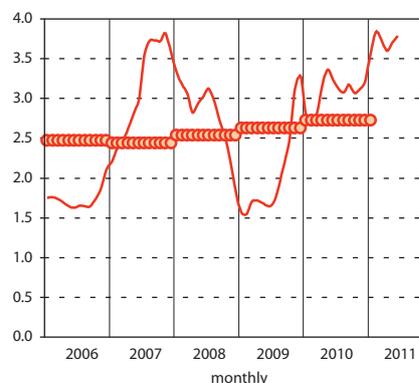
- National milk price
- ▲ National feed price
- IFCN feed price indicator (world)



Farm gate milk prices

1,000 NPR / 100 kg milk (ECM)

- National price
- IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, milk production.

Estimates done for: Milk production and cow/buffalo numbers 2010. Milk price 2009-2010. Monthly prices: annual prices.

Dairy farm number 2004: based on the mean number of cattle and buffalo per agricultural households (3.1 buffalo and 2.1 cattle per farm).

Remarks: Since no statistical information on soybean meal and corn prices are available the world market prices are used.

Land price: national survey; non-irrigated land price in Kavrepalanchowk district.





Michel de Haan



3.64 The Netherlands – Milk production fact sheet

STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 12.8 mill t ECM (number 12 in the world)
- No. of dairy farms: 19,800
- Share of milk produced in farms with more than 50 cows: 88%
- Milk price: -3% to world market
- Feed price: 17% to world market

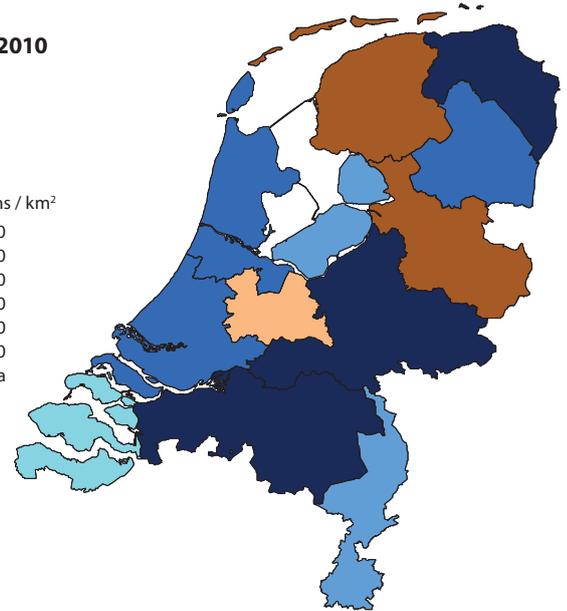
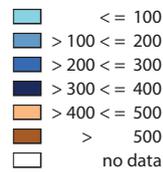
Key developments 2006-2010

- Milk production growth: +2.2% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 21% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 60%

Milk density 2010

in tons / km²

Milk density in tons / km²



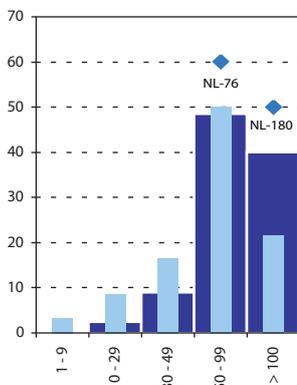
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	11.71	11.69	11.77	11.50	11.63	11.70	12.30	12.77	0.6%	2.2%
Cows (in 1,000's)	1,646	1,600	1,532	1,546	1,502	1,420	1,466	1,477	-0.8%	1.0%
Milk yield (t/cow/year)	7.1	7.3	7.7	7.4	7.7	8.2	8.4	8.6	1.4%	1.2%
Farm structure										
No. of dairy farms (in 1,000's)	39	36	32	26	24	22	21	20	-4.7%	-2.9%
Average farm size (cows/farm)	43	44	49	59	62	64	71	75	4.1%	4.0%
Prices in national currency										
Milk : feed price ratio	1.9	2.4	2.0	2.3	2.0	2.0	1.6	1.5	-1.6%	-7.1%
Cull cow (EUR / kg live weight)	0.98	1.00	1.04	0.73	0.88	1.08	1.15	1.03	0.3%	-1.2%
Land - buy (EUR / ha)	29,360	37,346	34,400	33,700	28,000	29,260	39,000	41,000	2.4%	8.8%
Quota (EUR / kg milk)	1.68	1.74	1.79	1.93	1.76	1.73	0.98	0.81	-5.1%	-17.3%

Farm structure

% of dairy farms and cows in size classes (2010)

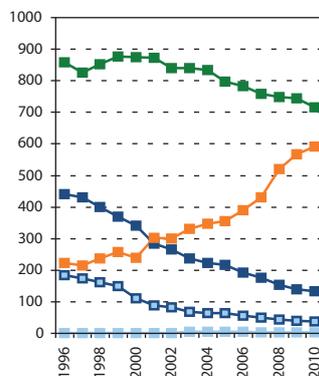
- Cows per size class
- Farms per size class
- ◆ IFCN typical farms*



Farm structure

cows per herd size (in 1,000's)

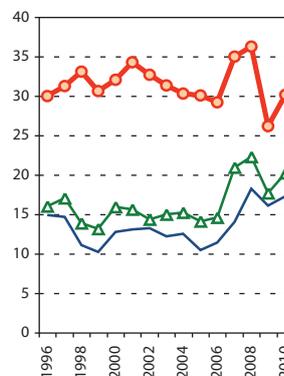
- 1 - 9
- 10 - 29
- 30 - 49
- 50 - 99
- > 100



Milk and feed price

EUR / 100 kg

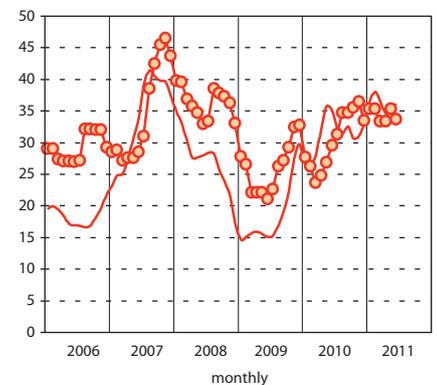
- National milk price
- △ National feed price
- IFCN feed price indicator (world)



Farm gate milk prices

EUR / 100 kg milk (ECM)

- National price
- IFCN milk price indicator (world)



* size class where IFCN typical farms are

Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.



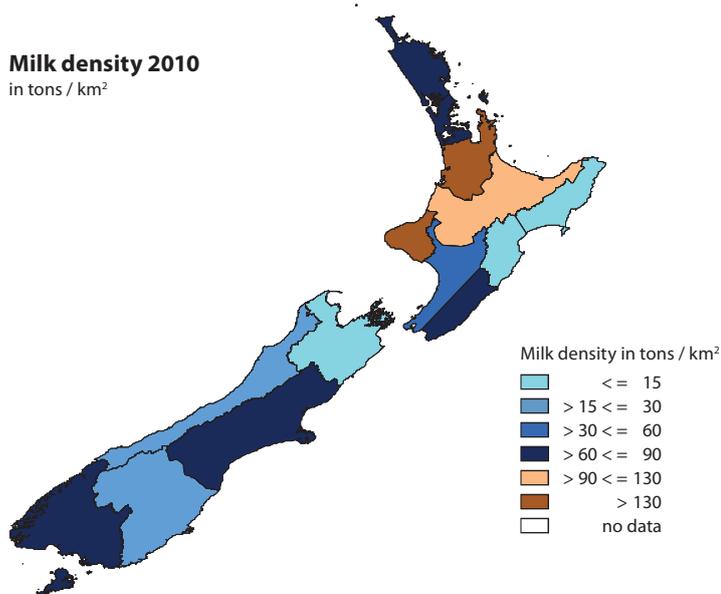
Nicola Shadbolt



Massey University

Milk density 2010

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 19.2 mill t ECM (number 9 in the world)
- No. of dairy farms: 11,691
- Share of milk produced in farms with more than 50 cows: 99%
- Milk price: -8% to world market
- Feed price: 22% to world market

Key developments 2006-2010

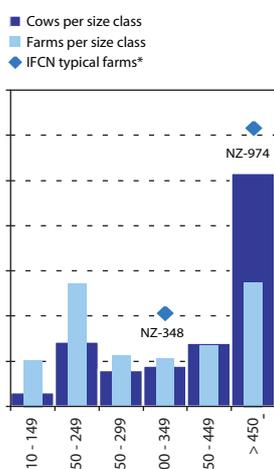
- Milk production growth: +1.4% per year
- Share of time milk price was above world market level: 20%
- Milk price was on average -12% below the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 20%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	11.86	12.00	14.06	15.78	16.55	18.11	17.40	19.16	3.5%	1.4%
Cows (in 1,000's)	2,936	3,223	3,269	3,693	3,851	3,832	4,013	4,397	2.9%	3.5%
Milk yield (t/cow/year)	4.0	3.7	4.3	4.3	4.3	4.7	4.3	4.4	0.5%	-2.0%
Farm structure										
No. of dairy farms (in 1,000's)	15	15	14	14	13	12	11	12	-1.6%	-0.4%
Average farm size (cows/farm)	199	220	236	271	302	322	351	376	4.6%	3.9%
Prices in national currency										
Milk : feed price ratio	0.9	1.0	1.1	1.0	1.2	1.2	1.1	1.4	2.9%	4.2%
Cull cow (NZD / kg live weight)	0.57	0.82	1.19	1.42	0.98	1.12	1.20	1.26	5.8%	2.9%
Land - buy (NZD / ha)	13,187	11,076	10,740	14,658	18,287	25,308	35,143	27,894	5.5%	2.5%

Farm structure

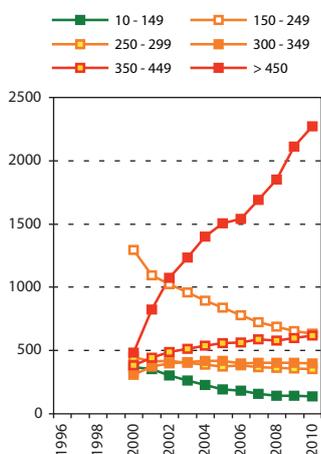
% of dairy farms and cows in size classes (2010)



* size class where IFCN typical farms are

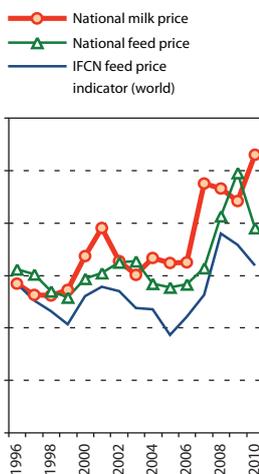
Farm structure

cows per herd size (in 1,000's)



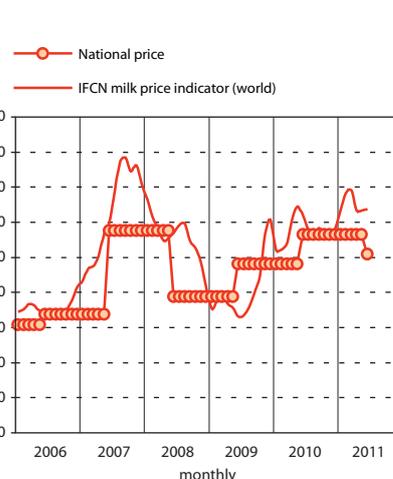
Milk and feed price

NZD / 100 kg



Farm gate milk prices

NZD / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Remarks: Annualised production and price data is shown.





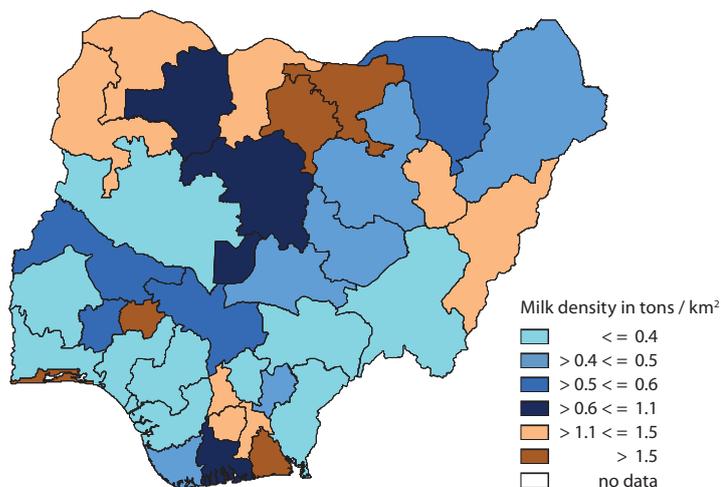


Isah Annatte,
Aminu Shittu



Milk density 2005

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 0.5 mill t ECM (number 94 in the world)
- No. of dairy farms: 325,000
- Share of milk produced in farms with more than 50 cows: 37% (2010)
- Milk price: -37% to world market
- Feed price: 82% to world market

Key developments 2006-2010

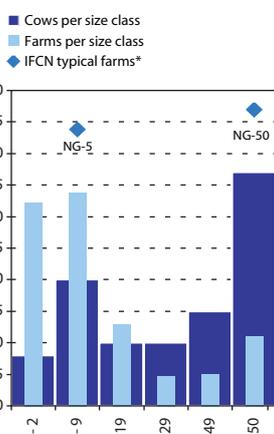
- Milk production growth: +1.4% per year
- Share of time milk price was above world market level: 0%
- Milk price was on average -26% below the world market
- Share of time feed price was above world market level: 20%
- Share of time milk : feed price ratio was above 1.5 (favourable): 80%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.38	0.37	0.39	0.41	0.42	0.46	0.47	0.49	1.8%	1.4%
Cows (in 1,000's)	3,401	3,002	3,207	3,573	3,864	4,262	4,252	4,252	1.6%	-0.1%
Milk yield (t/cow/year)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2%	1.5%
Farm structure										
No. of dairy farms (in 1,000's)	179	189	175	205	208	293	325	325	4.4%	2.6%
Average farm size (cows/farm)	19	16	18	17	19	15	13	13	-2.6%	-2.6%
Prices in national currency										
Milk : feed price ratio	2.7	3.4	3.6	4.8	3.7	4.0	2.9	0.6	-10.0%	-37.4%
Cull cow (NGN / kg live weight)	250	273	299	390	416	501	580	600	6.5%	4.6%
Land - buy (1,000 NGN / ha)	70	70	80	82	120	140	150	150	5.6%	1.7%

Farm structure

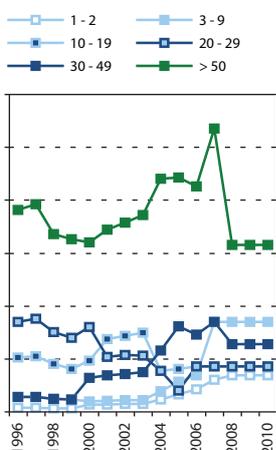
% of dairy farms and cows in size classes (2010)



* size class where IFCN typical farms are

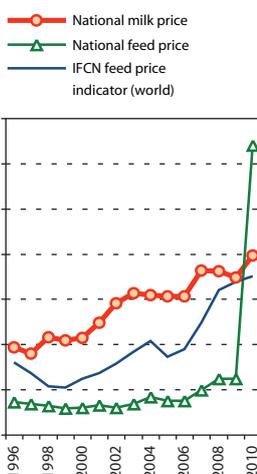
Farm structure

cows per herd size (in 1,000's)



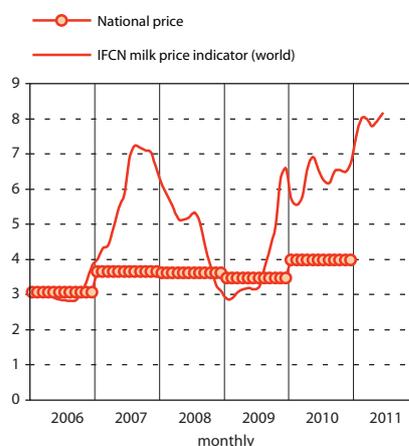
Milk and feed price

1,000 NGN / 100 kg



Farm gate milk prices

1,000 NGN / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2005, milk production.

Estimates done for: Monthly milk prices 2006-2010: Annual averages. Farm structure, cow and dairy farm numbers based on national reports.

Remarks: The price of soya bean and corn are not company quoted prices - it is the selling price per ton. It does not follow linear trends from year to year, instead it is influenced by price of farm inputs and supply-demand trend for the year.



Ola Flaten,
Bjørn Gunnar Hansen



3.67 Norway – Milk production fact sheet

STATUS AND KEY DEVELOPMENTS

Status 2010

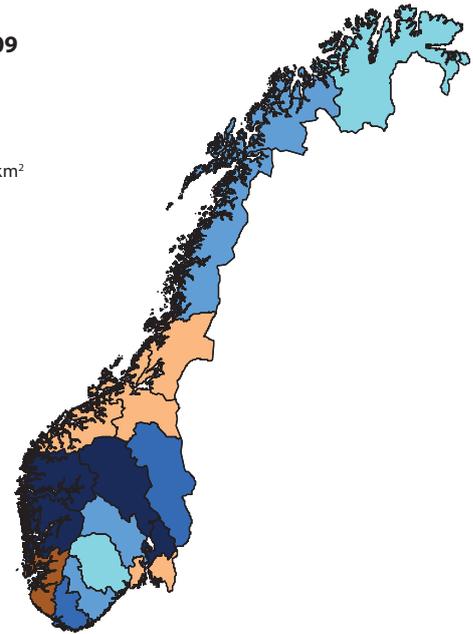
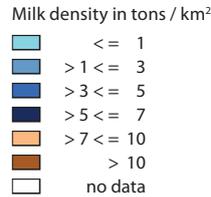
- Milk production (cow's): 1.7 mill t ECM (number 53 in the world)
- No. of dairy farms: 11,138
- Share of milk produced in farms with more than 30 cows: 34%
- Milk price: 67% to world market
- Feed price: 131% to world market

Key developments 2006-2010

- Milk production growth: +0.1% per year
- Share of time milk price was above world market level: 100%
- Milk price was on average 78% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

Milk density 2009

in tons / km²

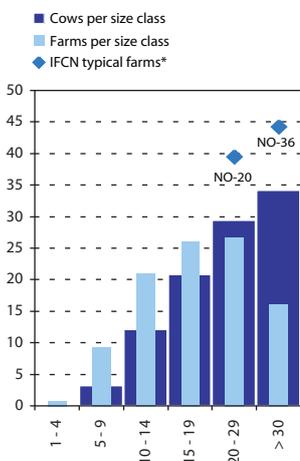


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	1.94	1.92	1.81	1.73	1.76	1.73	1.76	1.73	-0.8%	0.1%
Cows (in 1,000's)	318	314	298	282	272	259	248	238	-2.0%	-2.1%
Milk yield (t/cow/year)	6.1	6.1	6.1	6.1	6.5	6.7	7.1	7.3	1.3%	2.2%
Farm structure										
No. of dairy farms (in 1,000's)	25	24	21	19	17	15	13	11	-5.7%	-6.8%
Average farm size (cows/farm)	13	13	14	15	16	18	20	21	3.8%	5.0%
Prices in national currency										
Milk : feed price ratio	1.1	1.2	1.2	1.2	1.2	1.3	1.3	1.3	0.9%	0.1%
Cull cow (NOK / kg live weight)	14.60	14.30	11.10	12.21	13.37	13.82	15.09	16.68	1.0%	4.8%
Land - rent (NOK / ha)	1,370	1,470	1,520	1,220	1,300	1,440	1,350	1,390	0.1%	-0.9%
Quota (NOK / kg milk)		5.33	5.33	3.39	4.53	5.76	4.31	4.75		-4.7%

Farm structure

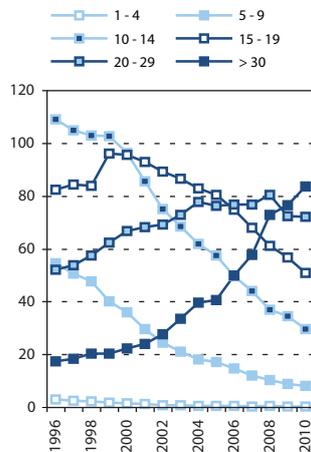
% of dairy farms and cows
in size classes (2010)



* size class where IFCN typical farms are

Farm structure

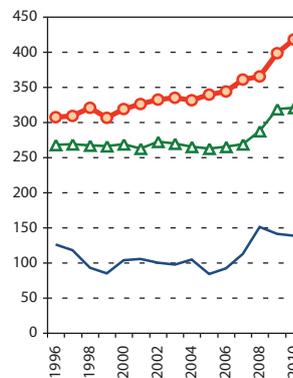
cows per herd size (in 1,000's)



Milk and feed price

NOK / 100 kg

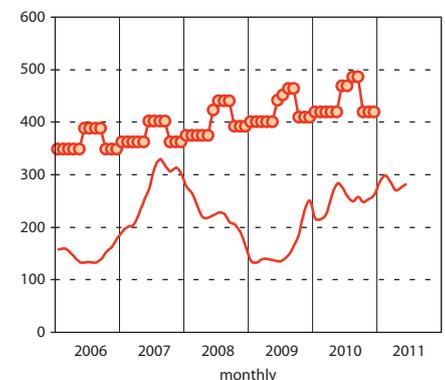
—○— National milk price
—△— National feed price
—□— IFCN feed price indicator (world)



Farm gate milk prices

NOK / 100 kg milk (ECM)

—○— National price
—□— IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, milk delivered.

Remarks: The feed price shown is that for a complete concentrate which is a mixture of soybean meal and barley including minerals and vitamins.

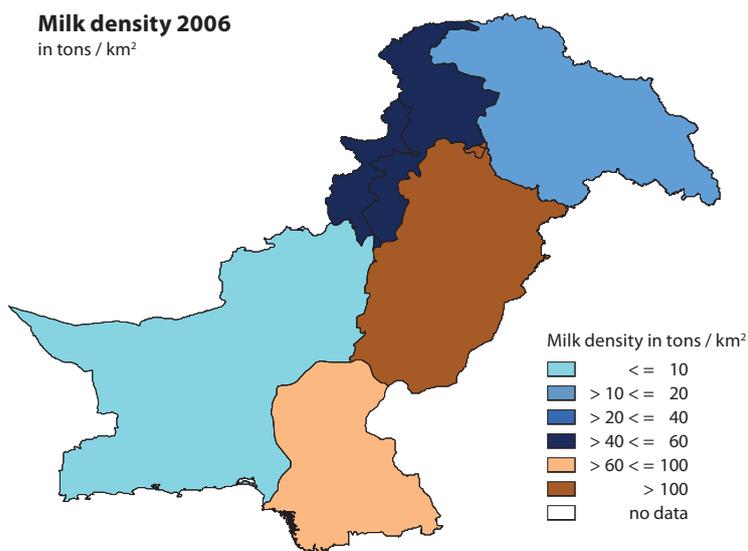


Saadia Hanif



Milk density 2006

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's and buffalo's): 40.9 mill t ECM (number 3 in the world)
- No. of dairy farms: 8.42 mill (2006)
- Share of milk produced in farms with more than 20 cows: 11% (2006)
- Milk price: -28% to world market
- Feed price: -37% to world market

Key developments 2006-2010

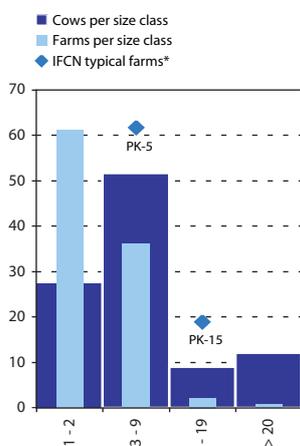
- Milk production growth: +3.2% per year
- Share of time milk price was above world market level: 0%
- Milk price was on average -29% below the world market
- Share of time feed price was above world market level: 20%
- Share of time milk : feed price ratio was above 1.5 (favourable): 40%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's and buffalo's)										
Production (mill t)	26.64	28.12	29.73	31.49	33.20	36.01	38.37	40.89	3.1%	3.2%
Cows and buffalos (in 1,000's)	20,949	21,961	23,270	24,452	25,733	24,917	28,750	30,350	2.7%	5.1%
Milk yield (t/cow/year)	1.3	1.3	1.3	1.3	1.3	1.4	1.3	1.3	0.4%	-1.7%
Farm structure										
No. of dairy farms (in 1,000's)	11,252	10,686	10,119	9,553	8,986	8,420	7,894	7,399	-3.0%	-3.2%
Average farm size (cows/farm)	1.9	2.1	2.3	2.6	2.9	3.0	3.6	4.1	5.8%	8.5%
Prices in national currency										
Milk : feed price ratio	0.8	0.8	0.8	0.9	1.6	1.3	1.5	2.0	6.6%	11.1%
Cull cow (PKR / kg live weight)	21	23	26	28	31	45	60	95	11.4%	20.5%
Land - buy (1,000 PKR / ha)	371	448	542	656	729	778	889	956	7.0%	5.3%

Farm structure

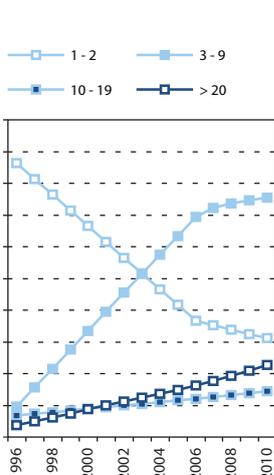
% of dairy farms and cows in size classes (2006)



* size class where IFCN typical farms are

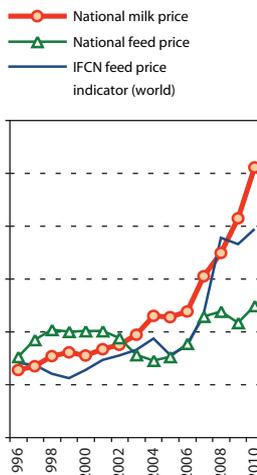
Farm structure

cows per herd size (in 1,000's)



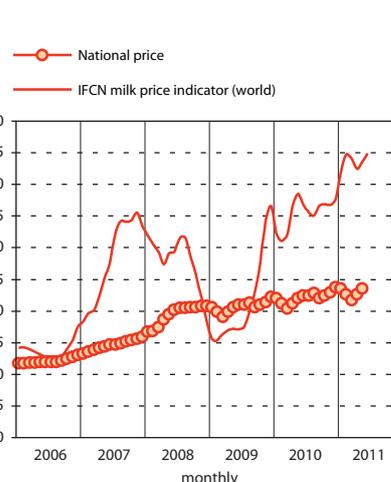
Milk and feed price

1,000 PKR / 100 kg



Farm gate milk prices

1,000 PKR / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2006, milk production based on regional distribution of milk cows and buffalos.

Estimates done for: Monthly milk price 2010-2011. Corn price 2009-2010. Farm structure: interpolated based on the census years 1996 and 2006; dairy farm and cow numbers 2007-2010 by IFCN.

Remarks: Cull cow and land price: Own data collection. Milk production data is seasonal (Year 2010 = season 2009/2010).

Country supporter:

The participation of Pakistan in IFCN was jointly supported by the organisations shown.



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 0.5 mill t ECM (number 95 in the world)
- No. of dairy farms: 7,000
- Milk price: -31% to world market
- Feed price: -17% to world market

Key developments 2006-2010

- Milk production growth: +1.4% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average -12% below the world market
- Share of time feed price was above world market level: 40%
- Share of time milk : feed price ratio was above 1.5 (favourable): 80%

Milk density 2010 in tons / km²



Key variables

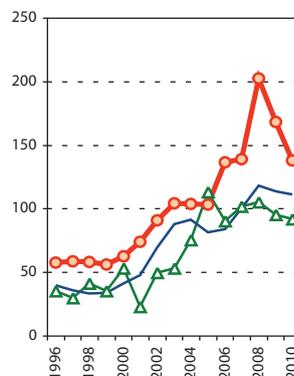
	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.34	0.37	0.43	0.42	0.41	0.45	0.45	0.48	2.5%	1.4%
Cows (in 1,000's)	174	185	138	163	157	157	160	170	-0.2%	2.0%
Milk yield (t/cow/year)	2.0	2.0	3.1	2.6	2.6	2.9	2.8	2.8	2.6%	-0.6%
Farm structure										
No. of dairy farms (in 1,000's)	17	14	11	9	8	8	7	7	-6.1%	-1.7%
Average farm size (cows/farm)	10	13	12	19	20	21	23	24	6.4%	3.8%
Prices in national currency										
Milk : feed price ratio	1.6	1.4	1.2	1.8	1.4	1.5	1.9	1.5	-0.6%	-0.2%
Cull cow (PYG / kg live weight)	1,329	1,770	1,897	2,285	3,031	4,155	5,380	7,250	12.9%	14.9%
Land - buy (1,000 PYG / ha)							3,000	3,219		



Milk and feed price

1,000 PYG / 100 kg

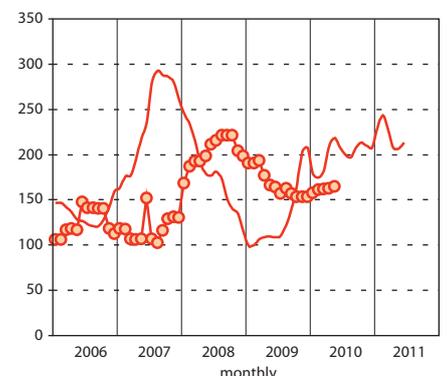
- National milk price
- △ National feed price
- IFCN feed price indicator (world)



Farm gate milk prices

1,000 PYG / 100 kg milk (ECM)

- National price
- IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Milk production 2010. Dairy farm numbers 1996, 2002 and 2008 estimated based on national surveys, inbetween interpolation. Soybean meal price 2010.

3.70 Peru – Milk production fact sheet



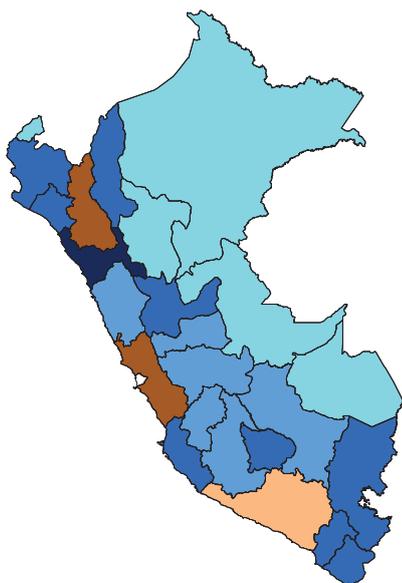
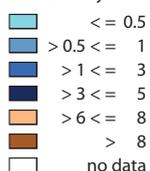
Carlos A. Gomez



Milk density 2008

in tons / km²

Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 1.7 mill t ECM (number 54 in the world)
- No. of dairy farms: 112,300
- Share of milk produced in farms with more than 100 cows: 6%
- Milk price: -28% to world market
- Feed price: 75% to world market

Key developments 2006-2010

- Milk production growth: +6% per year
- Share of time milk price was above world market level: 40%
- Milk price was on average -24% below the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

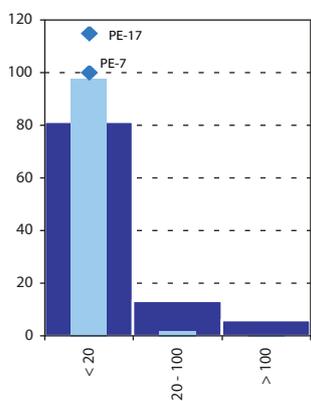
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.87	0.96	1.02	1.14	1.21	1.37	1.58	1.72	5.0%	6.0%
Cows (in 1,000's)	553	520	504	628	657	732	769	787	2.6%	1.8%
Milk yield (t/cow/year)	1.6	1.8	2.0	1.8	1.8	1.9	2.1	2.2	2.4%	4.1%
Farm structure										
No. of dairy farms (in 1,000's)	91	86	83	104	106	111	112	112	1.5%	0.3%
Average farm size (cows/farm)	6.1	6.1	6.1	6.1	6.2	6.6	6.9	7.0	1.0%	1.5%
Prices in national currency										
Milk : feed price ratio	0.8	0.8	0.9	0.9	1.0	1.0	0.8	0.7	-0.8%	-8.2%
Cull cow (PEN / kg live weight)	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	0.0%	0.0%
Land - buy (PEN / ha)	24,950	26,223	27,693	28,230	29,133	30,000	31,200	31,250	1.6%	1.0%

Farm structure

% of dairy farms and cows in size classes (2010)

■ Cows per size class
■ Farms per size class
◆ IFCN typical farms*

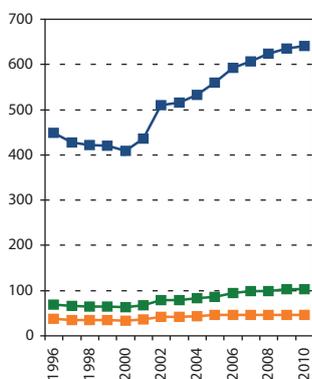


* size class where IFCN typical farms are

Farm structure

cows per herd size (in 1,000's)

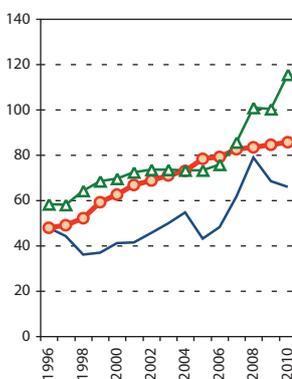
■ < 20
■ 20 - 100
■ > 100



Milk and feed price

PEN / 100 kg

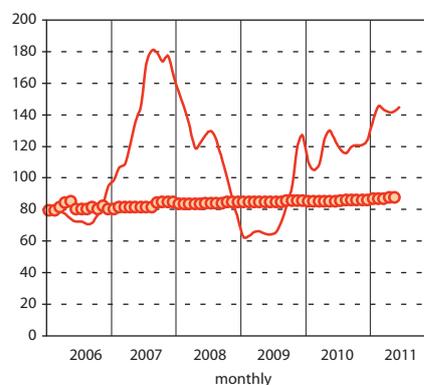
○ National milk price
△ National feed price
— IFCN feed price indicator (world)



Farm gate milk prices

PEN / 100 kg milk (ECM)

○ National price
— IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2008, milk production.



Naomi K. Torreta



3.71 Philippines – Milk production fact sheet

STATUS AND KEY DEVELOPMENTS

Status 2010

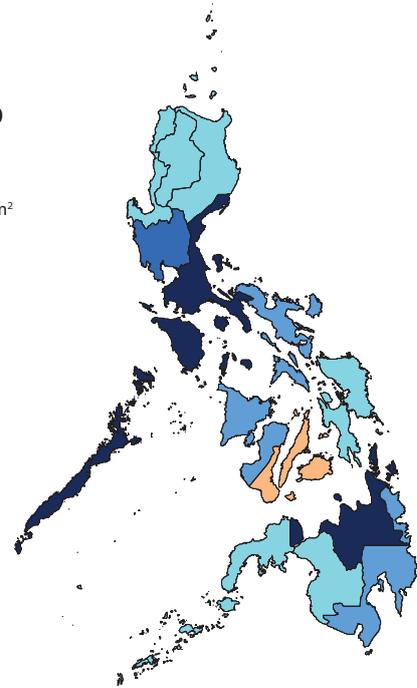
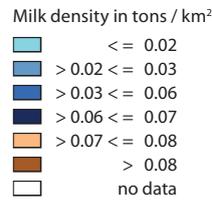
- Milk production (cow's and buffalo's): 0.02 mill t ECM (number 152 in the world)
- No. of dairy farms: 5,000
- Share of milk produced in farms with more than 50 cows: 28% (2002)
- Milk price: 38% to world market
- Feed price: 49% to world market

Key developments 2006-2010

- Milk production growth: +6.2% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 38% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 80%

Milk density 2010

in tons / km²

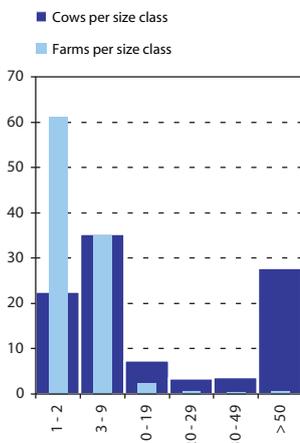


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's and buffalo's)										
Production (mill t)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	2.9%	6.2%
Cows and buffalos (in 1,000's)	4.8	3.7	5.5	6.1	7.0	7.4	7.9	8.7	4.3%	4.4%
Milk yield (t/cow/year)	2.2	2.4	2.0	1.9	1.7	1.7	1.8	1.8	-1.4%	1.7%
Farm structure										
No. of dairy farms (in 1,000's)				4.9	5.0	5.0	5.0	5.0		0.3%
Average farm size (cows/farm)				1.2	1.4	1.5	1.6	1.7		4.1%
Prices in national currency										
Milk : feed price ratio	1.8	1.8	1.9	2.1	1.6	1.9	1.5	1.7	-0.6%	-3.4%
Cull cow (PHP / kg live weight)	32.61	33.04	38.34	41.12	46.15	52.01	57.80	66.81	5.3%	6.5%
Land - buy (1,000 PHP / ha)										

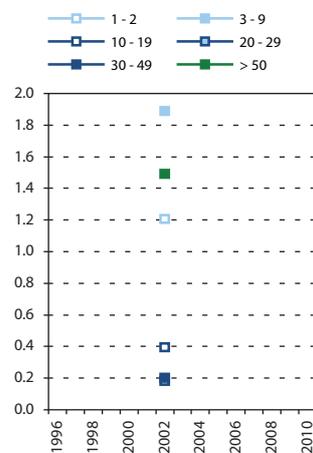
Farm structure

% of dairy farms and cows in size classes (2002)



Farm structure

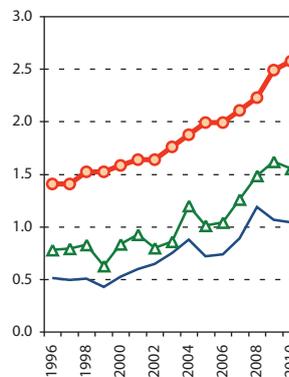
cows per herd size (in 1,000's)



Milk and feed price

1,000 PHP / 100 kg

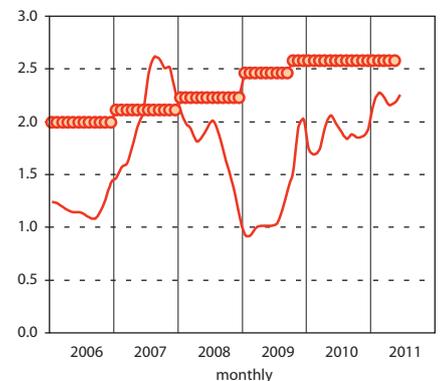
—○— National milk price
—△— National feed price
—□— IFCN feed price indicator (world)



Farm gate milk prices

1,000 PHP / 100 kg milk (ECM)

—○— National price
—□— IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

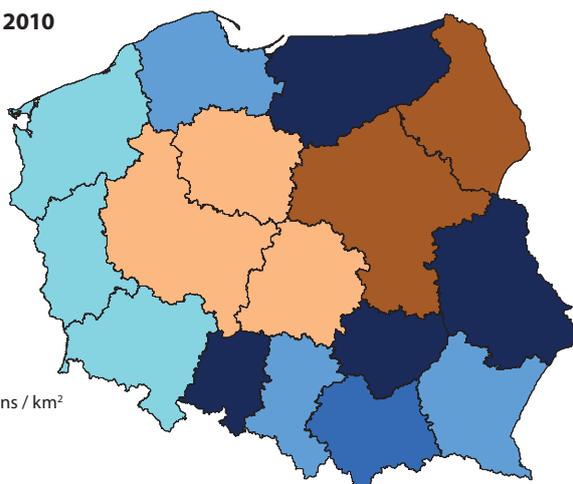
Milk map details: Data based on the year 2010, milk production.



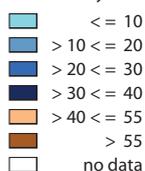
Michal Switlyk,
Agata Wójcik



Milk density 2010 in tons / km²



Milk density in tons / km²

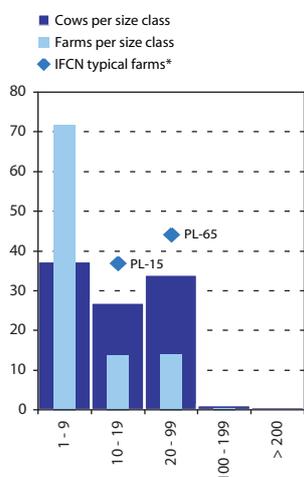


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	12.01	12.93	12.22	12.19	12.14	12.30	12.24	11.93	0.0%	-0.8%
Cows (in 1,000's)	3,442	3,471	3,047	2,904	2,730	2,705	2,551	2,529	-2.2%	-1.7%
Milk yield (t/cow/year)	3.5	3.7	4.0	4.2	4.4	4.5	4.8	4.7	2.2%	0.9%
Farm structure										
No. of dairy farms (in 1,000's)		1,397	1,281	875	910	693	575	465		-9.5%
Average farm size (cows/farm)		2.5	2.4	3.3	3.0	3.9	4.4	5.4		8.7%
Prices in national currency										
Milk : feed price ratio	0.9	1.1	1.1	1.1	1.2	1.7	1.3	1.5	4.3%	-2.7%
Cull cow (PLN / kg live weight)	2.25	2.26	2.33	2.18	2.55	4.12	4.07	3.35	2.9%	-5.0%
Land - buy (PLN / ha)	3,216	4,379	4,786	5,042	6,498	9,290	13,954	23,000	15.1%	25.4%
Quota (PLN / kg milk)						0.57	0.50	0.08		-38.8%

Farm structure

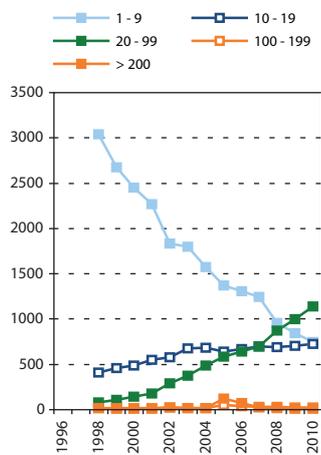
% of dairy farms and cows
in size classes (2008)



* size class where IFCN typical farms are

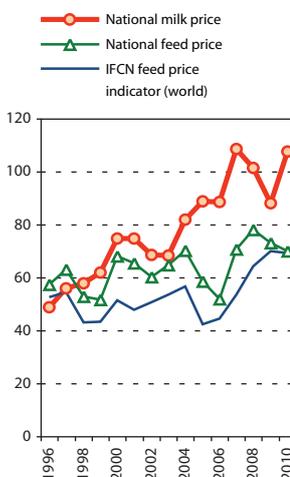
Farm structure

cows per herd size (in 1,000's)



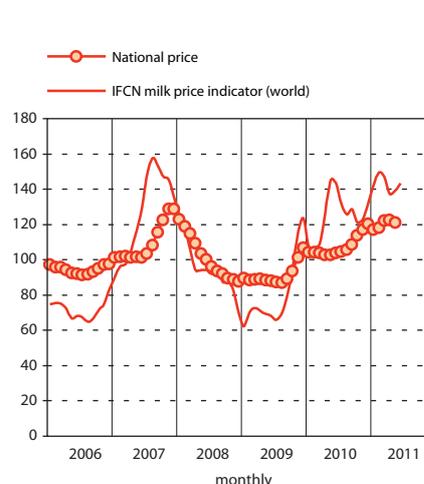
Milk and feed price

PLN / 100 kg



Farm gate milk prices

PLN / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Farm structure: Cow number 2009-2010 following the trend. Land prices 2009-2010. Soybean meal price 2004-2005 based on trend of world market price.



António Moitinho Rodrigues



3.73 Portugal – Milk production fact sheet

STATUS AND KEY DEVELOPMENTS

Status 2010

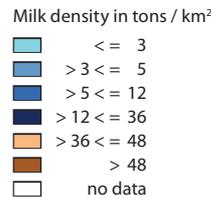
- Milk production (cow's): 1.9 mill t ECM (number 49 in the world)
- No. of dairy farms: 10,000
- Share of milk produced in farms with more than 50 cows: 64% (2009)
- Milk price: -6% to world market
- Feed price: 31% to world market

Key developments 2006-2010

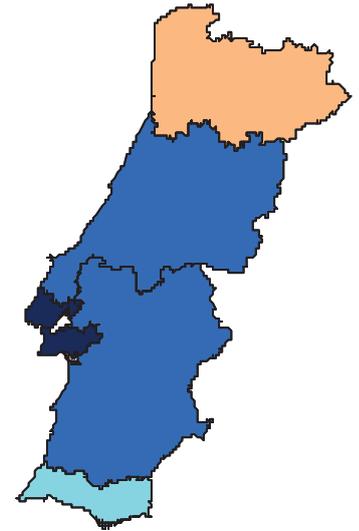
- Milk production growth: -0.5% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 23% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 60%

Milk density 2009

in tons / km²



Azoren
Madeira

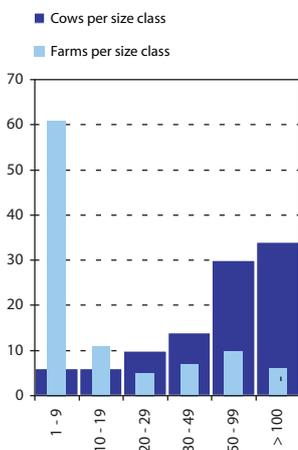


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	1.73	1.79	2.00	2.04	2.00	1.94	1.98	1.90	0.7%	-0.5%
Cows (in 1,000's)	376	372	355	341	338	307	301	282	-2.0%	-2.1%
Milk yield (t/cow/year)	4.6	4.8	5.6	6.0	5.9	6.3	6.6	6.7	2.8%	1.6%
Farm structure										
No. of dairy farms (in 1,000's)	48	41	24	19	16	15	11	10	-10.6%	-10.2%
Average farm size (cows/farm)	8	9	15	18	21	20	26	28	9.6%	9.0%
Prices in national currency										
Milk : feed price ratio	1.4	1.6	1.7	1.8	1.6	1.7	1.5	1.3	-0.4%	-6.8%
Cull cow (EUR / kg live weight)	0.63	0.70	0.73	0.77	0.71	0.92	0.81	0.79	1.6%	-3.7%
Land - buy (EUR / ha)	5,000	5,000	5,000	4,000	4,000	4,000	6,000	7,200	2.6%	15.8%
Quota (EUR / kg milk)	0.03	0.05	0.15	0.20	0.20	0.35	0.08	0.01	-6.3%	-58.9%

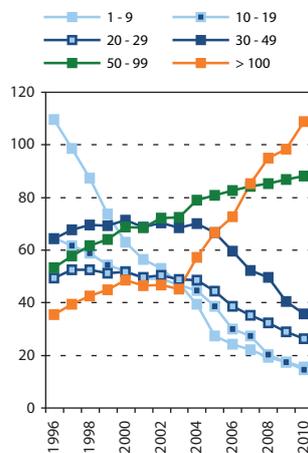
Farm structure

% of dairy farms and cows in size classes (2009)



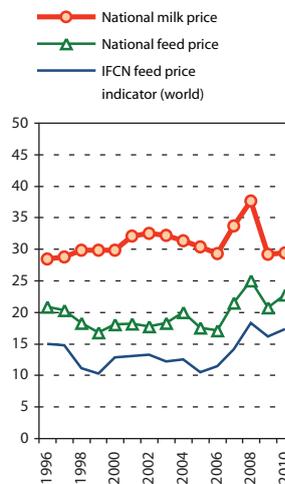
Farm structure

cows per herd size (in 1,000's)



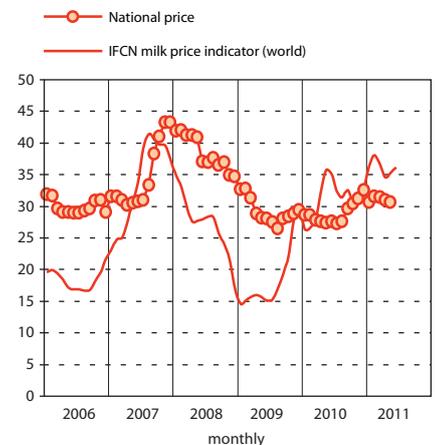
Milk and feed price

EUR / 100 kg



Farm gate milk prices

EUR / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, milk production.

Estimates done for: Farm structure: Cow number 2010 following the trend.

3.74 Romania – Milk production fact sheet



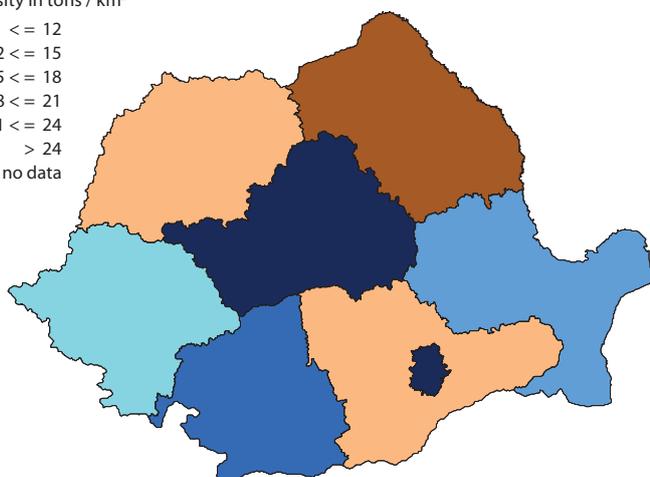
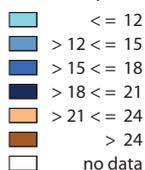
Michel Noordman

Dairy Farmer

Milk density 2009

in tons / km²

Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 4.6 mill t ECM (number 25 in the world)
- No. of dairy farms: 799,889
- Share of milk produced in farms with more than 50 cows: 6% (2007)
- Milk price: -24% to world market
- Feed price: 3% to world market

Key developments 2006-2010

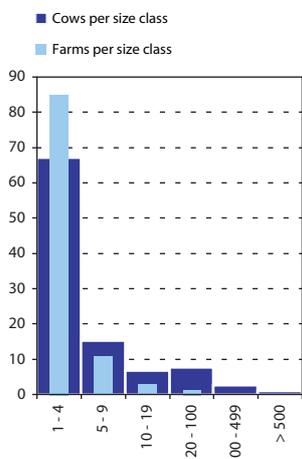
- Milk production growth: -3.4% per year
- Share of time milk price was above world market level: 40%
- Milk price was on average -13% below the world market
- Share of time feed price was above world market level: 80%
- Share of time milk : feed price ratio was above 1.5 (favourable): 40%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	4.66	4.49	4.28	4.61	5.02	5.29	4.86	4.61	-0.1%	-3.4%
Cows (in 1,000's)	1,939	1,794	1,775	1,759	1,755	1,733	1,483	1,349	-2.6%	-6.1%
Milk yield (t/cow/year)	2.4	2.5	2.4	2.6	2.9	3.1	3.3	3.4	2.5%	2.8%
Farm structure										
No. of dairy farms (in 1,000's)	1,365	1,260	1,329	1,191	1,170	1,073	946	800	-3.7%	-7.1%
Average farm size (cows/farm)	1.4	1.4	1.3	1.5	1.5	1.6	1.6	1.7	1.2%	1.1%
Prices in national currency										
Milk : feed price ratio	0.2	0.6	1.0	1.3	1.1	1.7	1.1	1.3	13.6%	-5.9%
Cull cow (RON / kg live weight)					2.19	2.60	2.75	3.50		7.7%
Land - buy (RON / ha)						5,250	4,430	5,579		1.5%

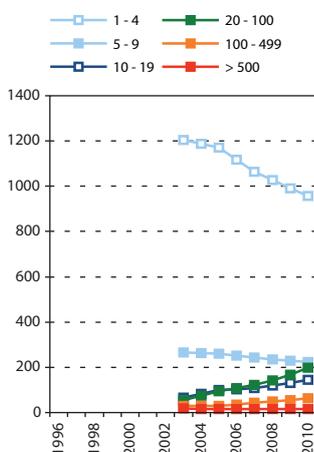
Farm structure

% of dairy farms and cows in size classes (2007)



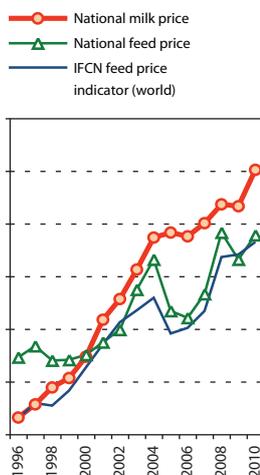
Farm structure

cows per herd size (in 1,000's)



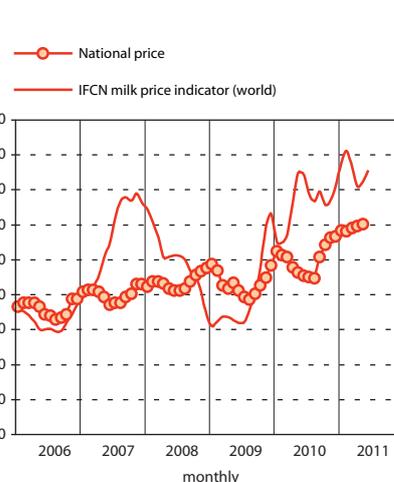
Milk and feed price

RON / 100 kg



Farm gate milk prices

RON / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, milk production.

Estimates done for: Farm structure: Cow number 2008-2010 following the trend. Dairy farm number 2010. Barley price 2007-2010.

Remarks: The milk price shown is for small farms. Farmers with a cooling tank and quality milk on EU standards receive higher prices.

A quota market is not really existing, but there are transaction costs which have to be paid.





Evgeny Smirnov



3.75 Russian Federation – Milk production fact sheet

STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 30.2 mill t ECM (number 7 in the world)
- No. of dairy farms: 3,160,000
- Share of milk produced in farms with more than 100 cows: 40%
- Milk price: 14% to world market
- Feed price: -18% to world market

Key developments 2006-2010

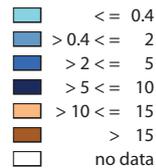
- Milk production growth: +0.8% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 7% above the world market
- Share of time feed price was above world market level: 40%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

Milk density 2010

in tons / km²



Milk density in tons / km²

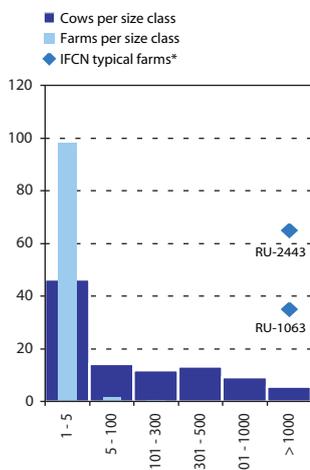


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	31.52	29.50	29.27	30.66	29.48	29.28	30.52	30.22	-0.3%	0.8%
Cows (in 1,000's)	16,557	13,837	12,771	11,873	10,425	9,647	9,129	8,800	-4.4%	-2.3%
Milk yield (t/cow/year)	1.9	2.1	2.3	2.6	2.8	3.0	3.3	3.4	4.3%	3.1%
Farm structure										
No. of dairy farms (in 1,000's)				2,222	2,679	3,135	3,160	3,160		0.2%
Average farm size (cows/farm)				5.3	3.9	3.1	2.9	2.8		-2.5%
Prices in national currency										
Milk : feed price ratio		1.4	1.2	1.5	1.4	1.8	1.6	2.5		8.4%
Cull cow (RUB / kg live weight)								35.00		
Land - buy (RUB / ha)								17,540		

Farm structure

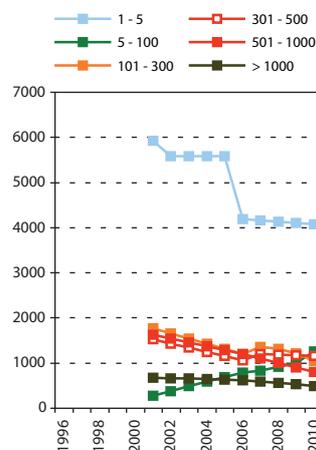
% of dairy farms and cows
in size classes (2010)



* size class where IFCN typical farms are

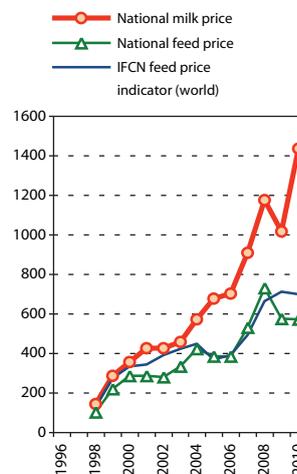
Farm structure

cows per herd size (in 1,000's)



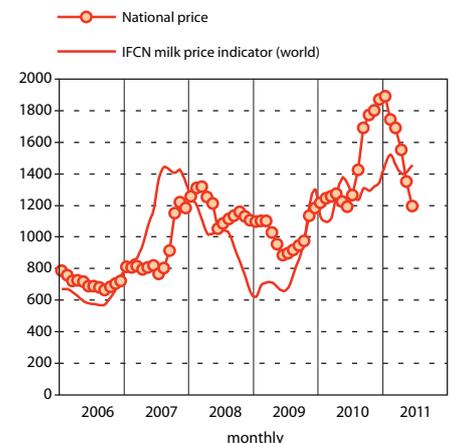
Milk and feed price

RUB / 100 kg



Farm gate milk prices

RUB / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

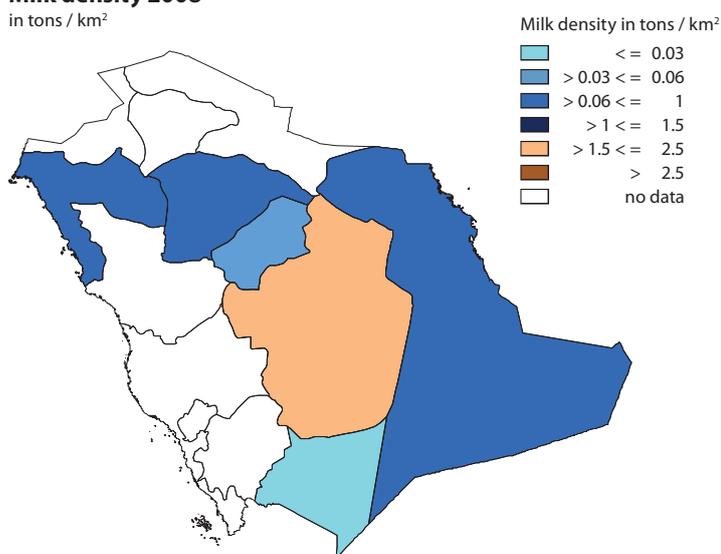
Milk map details: Data based on the year 2010, milk production.

Estimates done for: Barley prices 1996-2003 estimated to be 80% of world market price.

Remarks: Since no statistical information on soybean meal prices 1996-2003 are available the world market price is used.

Milk density 2008

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 1.1 mill t ECM (number 61 in the world)
- No. of dairy farms: 28
- Milk price: 84% to world market
- Feed price: 30% to world market

Key developments 2006-2010

- Milk production growth: +1% per year
- Share of time milk price was above world market level: 100%
- Milk price was on average 99% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

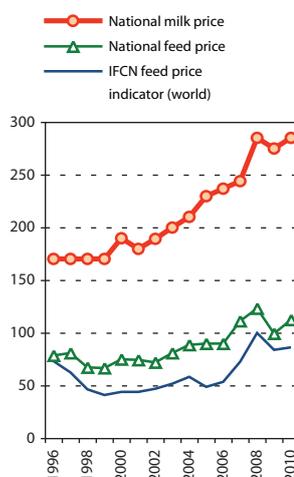
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates		
									1996-2010	2006-10	
Milk production in ECM (cow's)											
Production (mill t)	0.45	0.58	0.71	0.83	0.87	1.03	1.04	1.07	6.3%	1.0%	
Cows (in 1,000's)	59	73	84	88	101	109	112	118	5.1%	2.1%	
Milk yield (t/cow/year)	7.7	7.9	8.4	9.4	8.5	9.5	9.3	9.1	1.2%	-1.0%	
Farm structure											
No. of dairy farms (in 1,000's)				0.034	0.032	0.028	0.028	0.028			0.0%
Average farm size (cows/farm)				2,583	3,169	3,879	3,986	4,214			2.1%
Prices in national currency											
Milk : feed price ratio	2.2	2.5	2.5	2.6	2.4	2.6	2.3	2.5	1.1%	-0.9%	
Cull cow (SAR / kg live weight)											
Land - buy (SAR / ha)											



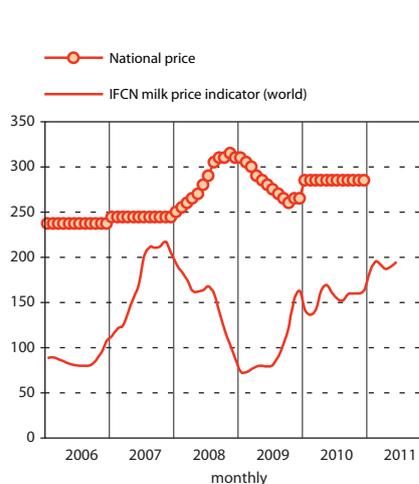
Milk and feed price

SAR / 100 kg



Farm gate milk prices

SAR / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2008, milk production.

Estimates done for: Soybean meal price estimated for the years 1996-2001. Barley price estimated for 2006-2007. Monthly milk prices 2009-2010.

Monthly milk price 2010: annual average.



STATUS AND KEY DEVELOPMENTS

Status 2010

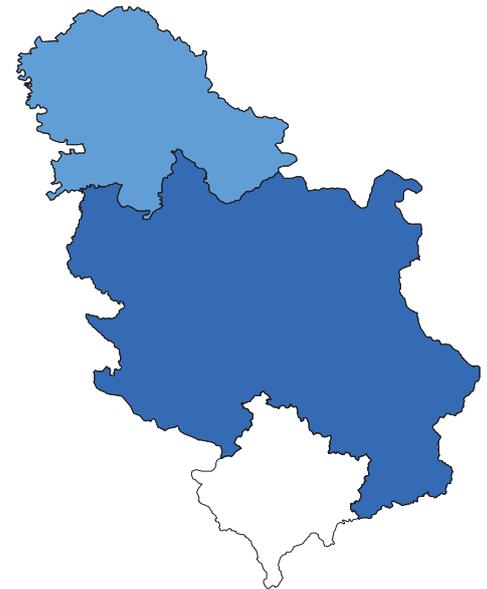
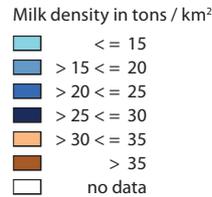
- Milk production (cow's): 1.5 mill t ECM (number 60 in the world)
- No. of dairy farms: 255,000
- Share of milk produced in farms with more than 50 cows: 10%
- Milk price: -32% to world market
- Feed price: 25% to world market

Key developments 2006-2010

- Milk production growth: -2.1% per year
- Share of time milk price was above world market level: 40%
- Milk price was on average -15% below the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

Milk density 2010

in tons / km²

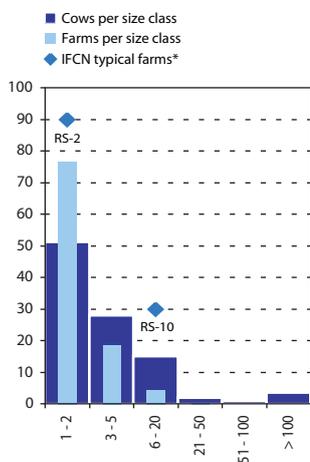


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	1.51	1.65	1.61	1.62	1.62	1.63	1.58	1.49	-0.1%	-2.1%
Cows (in 1,000's)	828	813	817	752	742	674	624	561	-2.7%	-4.5%
Milk yield (t/cow/year)	1.8	2.0	2.0	2.2	2.2	2.4	2.5	2.7	2.8%	2.5%
Farm structure										
No. of dairy farms (in 1,000's)				375	345	315	285	255		-5.1%
Average farm size (cows/farm)				2.0	2.2	2.1	2.2	2.2		0.7%
Prices in national currency										
Milk : feed price ratio	0.9	1.1	0.7	1.1	1.1	1.2	1.3	1.0	0.6%	-4.5%
Cull cow (RSD / kg live weight)	7	15	33	68	72	89	91	102	20.7%	3.5%
Land - buy (1,000 RSD / ha)					250	320	430	460		9.5%

Farm structure

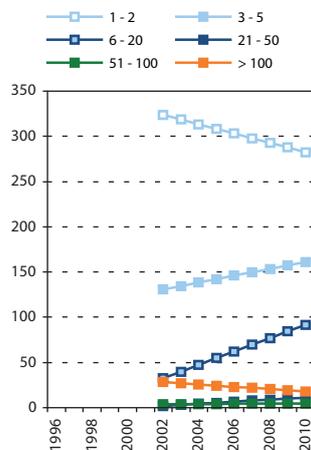
% of dairy farms and cows in size classes (2009)



* size class where IFCN typical farms are

Farm structure

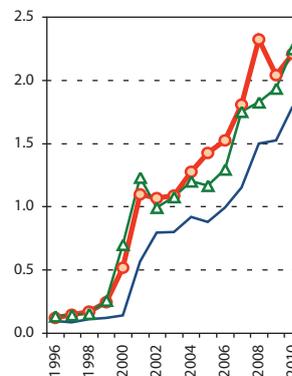
cows per herd size (in 1,000's)



Milk and feed price

1,000 RSD / 100 kg

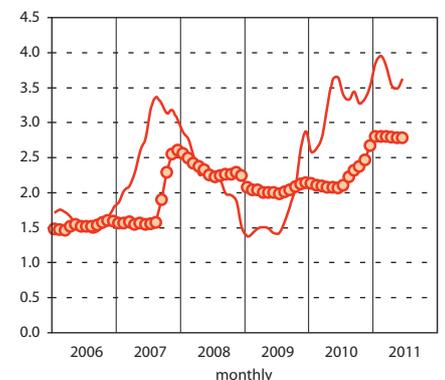
—○— National milk price
—△— National feed price
—□— IFCN feed price indicator (world)



Farm gate milk prices

1,000 RSD / 100 kg milk (ECM)

—○— National price
—□— IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Farm structure: Cow number 2003-2008 by interpolation and 2010 following the trend. Monthly milk prices May-June 2011.

Remarks: Farm structure includes only farms that participated in Census 2002. Beside family dairy farms in Serbia, now about 50 farms classified as legal units (ex- governmental, new company farms) exist which count about 20,000 cows.

Country supporter:

The participation in the IFCN was supported by Imlek and Mlekara Subotica



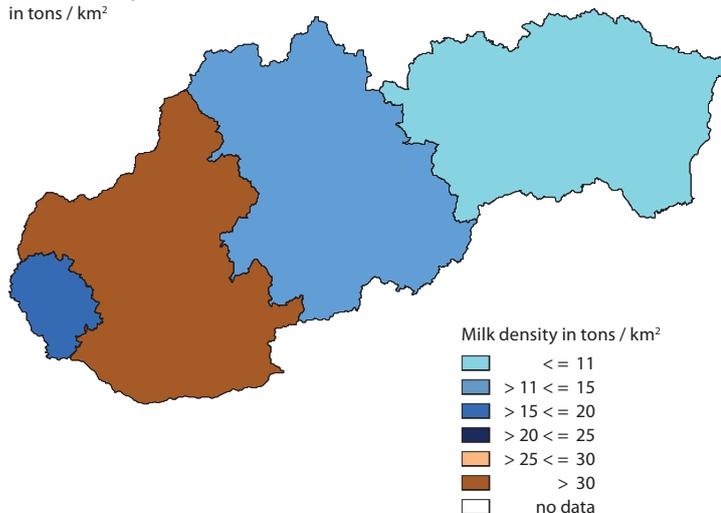


Margita Stefanikova



Milk density 2010

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 0.9 mill t ECM (number 73 in the world)
- No. of dairy farms: 5293
- Share of milk produced in farms with more than 50 cows: 91% (2010)
- Milk price: -11% to world market
- Feed price: -6% to world market

Key developments 2006-2010

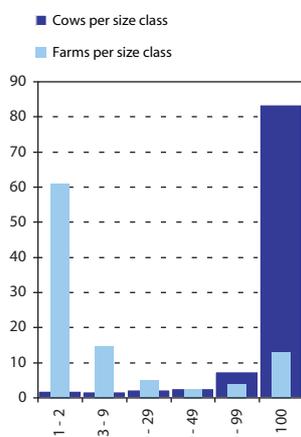
- Milk production growth: -3.9% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average 7% above the world market
- Share of time feed price was above world market level: 80%
- Share of time milk : feed price ratio was above 1.5 (favourable): 60%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	1.11	1.13	1.05	1.15	1.05	1.05	1.03	0.90	-1.5%	-3.9%
Cows (in 1,000's)			230	216	201	196	197	197		0.1%
Milk yield (t/cow/year)			4.5	5.3	5.2	5.4	5.2	4.6		-4.0%
Farm structure										
No. of dairy farms (in 1,000's)			8.1	7.0	6.3	5.5	5.3	5.3		-1.0%
Average farm size (cows/farm)			29	31	32	35	37	37		1.2%
Prices in national currency										
Milk : feed price ratio	1.2	1.3	1.5	1.6	1.7	1.5	1.5	1.7	2.6%	2.7%
Cull cow (EUR / kg live weight)	0.65	0.62	0.62	0.56	0.60	0.82	0.83	0.75	1.0%	-2.1%
Land - buy (EUR / ha)			895	888	946	1,017	1,211	1,265		5.6%
Quota (EUR / kg milk)										

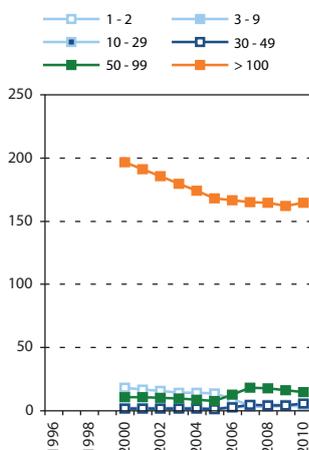
Farm structure

% of dairy farms and cows in size classes (2010)



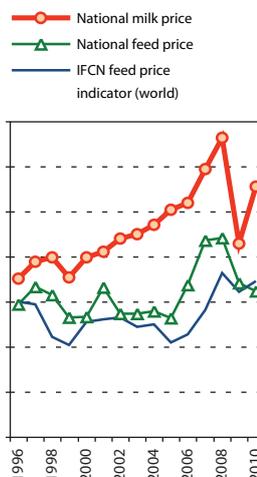
Farm structure

cows per herd size (in 1,000's)



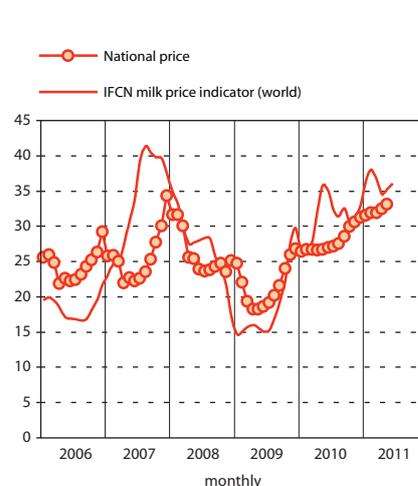
Milk and feed price

EUR / 100 kg



Farm gate milk prices

EUR / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Feed prices 2010: average of January-June prices. Land price: 2010.

Remarks: Farm structure, cow and dairy farm numbers include dairy and suckler cows / farms.

Farm numbers: 2000-2006 trend of all cattle farms used - no separation in national statistics.





Ben Moljk



STATUS AND KEY DEVELOPMENTS

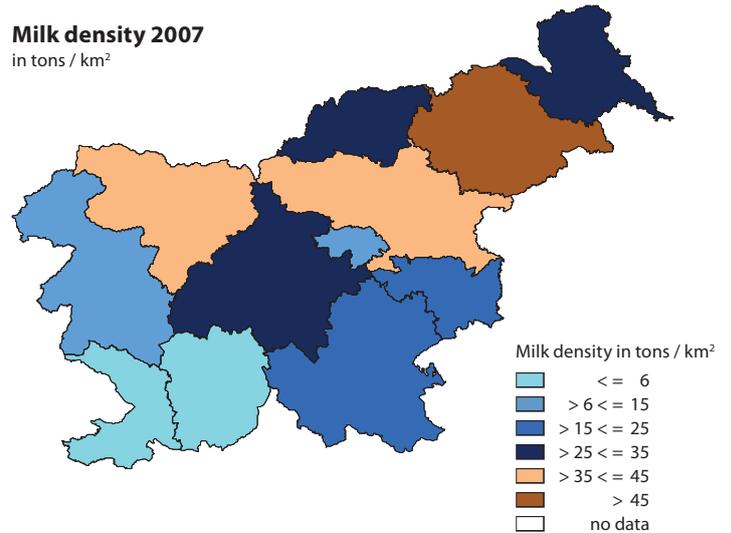
Status 2010

- Milk production (cow's): 0.6 mill t ECM (number 88 in the world)
- No. of dairy farms: 19,972
- Share of milk produced in farms with more than 50 cows: 8% (2007)
- Milk price: -17% to world market
- Feed price: 30% to world market

Key developments 2006-2010

- Milk production growth: -1.3% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average 5% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

Milk density 2007
in tons / km²

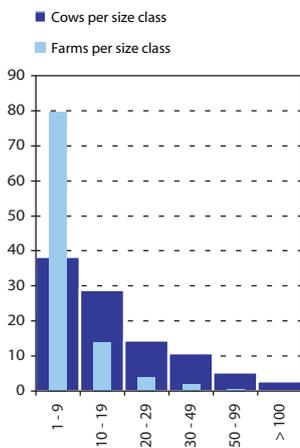


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.59	0.61	0.66	0.74	0.67	0.65	0.67	0.62	0.3%	-1.3%
Cows (in 1,000's)	155	146	140	140	134	113	113	109	-2.5%	-0.7%
Milk yield (t/cow/year)	3.8	4.1	4.7	5.3	5.0	5.8	5.9	5.6	2.8%	-0.7%
Farm structure										
No. of dairy farms (in 1,000's)			29	21	18	20	19	20		0.3%
Average farm size (cows/farm)			5	7	7	6	6	5		-1.0%
Prices in national currency										
Milk : feed price ratio	1.0	1.7	1.3	1.4	1.2	1.5	1.4	1.2	0.9%	-5.8%
Cull cow (EUR / kg live weight)	0.85	0.84	0.75	0.65	0.51	0.78	0.89	0.83	-0.2%	1.5%
Land - buy (EUR / ha)	8,792	12,809	14,172	12,984	13,775	14,069	14,694	15,800	4.3%	2.9%

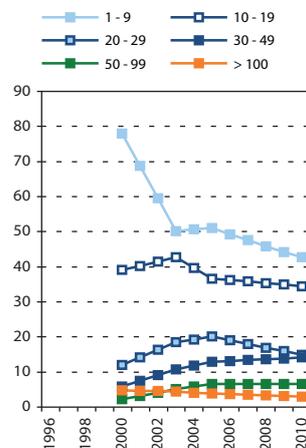
Farm structure

% of dairy farms and cows in size classes (2007)



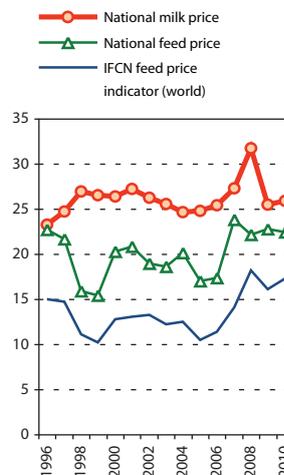
Farm structure

cows per herd size (in 1,000's)



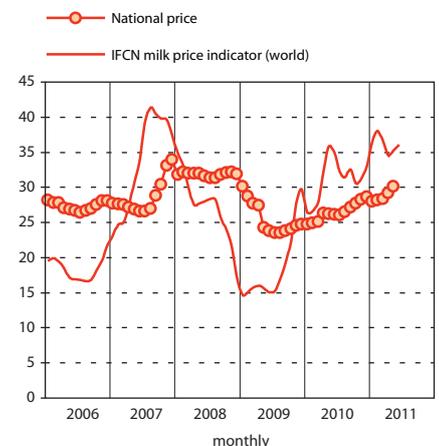
Milk and feed price

EUR / 100 kg



Farm gate milk prices

EUR / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2007, milk production.

Estimates done for: Dairy farm number 2008-2010. Farm structure: Cow number 2008-2010 following the trend.

Remarks: Feed prices are average prices out of nine Slovenian feed plants.

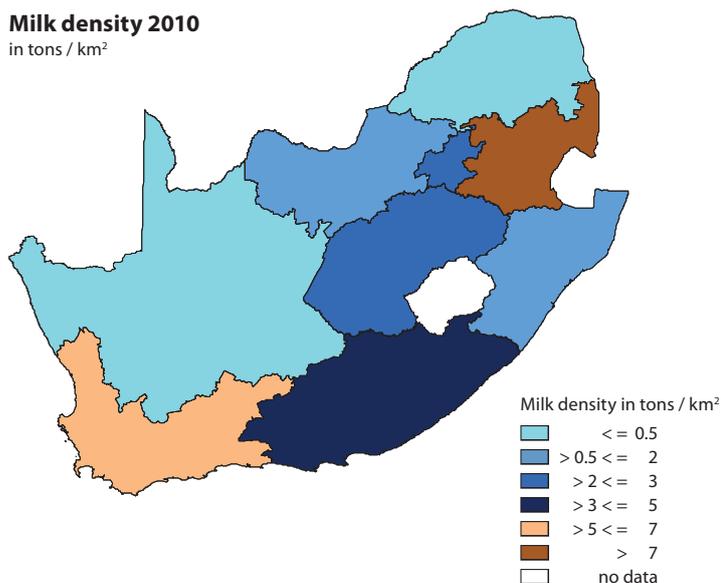


Koos Coetzee



Milk density 2010

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 2.8 mill t ECM (number 40 in the world)
- No. of dairy farms: 2,600
- Share of milk produced in farms with more than 50 cows: 95%
- Milk price: 0% to world market
- Feed price: 5% to world market

Key developments 2006-2010

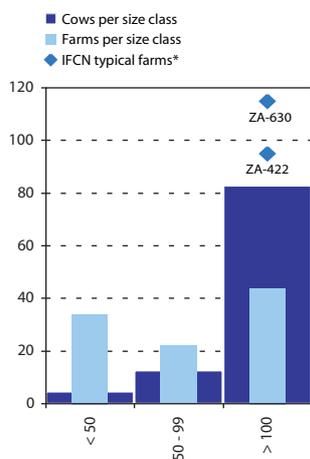
- Milk production growth: +2.6% per year
- Share of time milk price was above world market level: 40%
- Milk price was on average 3% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 20%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	2.62	2.94	2.52	2.60	2.32	2.49	2.80	2.76	0.4%	2.6%
Cows (in 1,000's)	562	552	545	540	540	520	520	530	-0.4%	0.5%
Milk yield (t/cow/year)	4.7	5.3	4.6	4.8	4.3	4.8	5.4	5.2	0.8%	2.1%
Farm structure										
No. of dairy farms (in 1,000's)	8.0	6.0	4.9	4.7	4.2	3.8	3.2	2.6	-7.7%	-9.1%
Average farm size (cows/farm)	70	92	111	115	129	137	163	204	7.9%	10.5%
Prices in national currency										
Milk : feed price ratio	1.3	1.5	1.4	1.1	1.6	1.2	1.2	1.7	1.9%	8.4%
Cull cow (ZAR / kg live weight)	10.00	9.67	10.00	11.00	12.00	13.00	14.00	12.00	1.3%	-2.0%
Land - buy (ZAR / ha)								20,000		

Farm structure

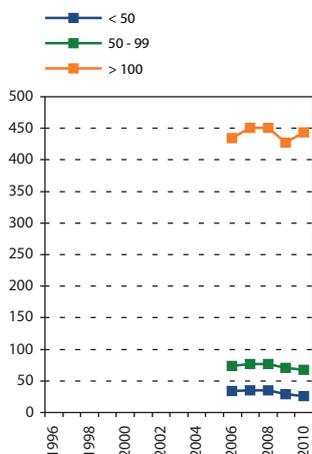
% of dairy farms and cows in size classes (2010)



* size class where IFCN typical farms are

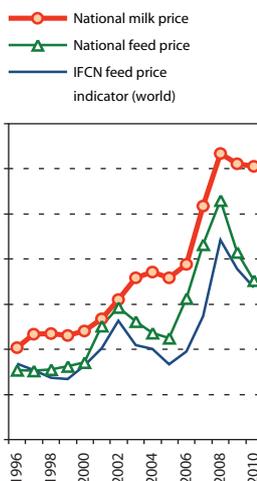
Farm structure

cows per herd size (in 1,000's)



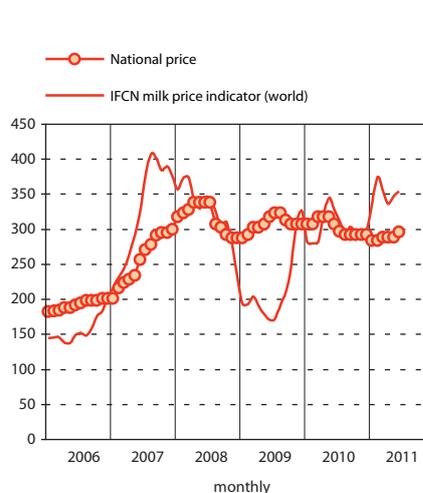
Milk and feed price

ZAR / 100 kg



Farm gate milk prices

ZAR / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Remarks: The farm gate milk price is taken from MPO (Milk Producer Organisation).





STATUS AND KEY DEVELOPMENTS

Status 2010

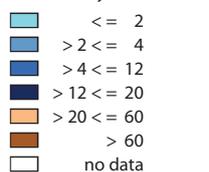
- Milk production (cow's): 6.1 mill t ECM (number 23 in the world)
- No. of dairy farms: 32,522
- Share of milk produced in farms with more than 50 cows: 54%
- Milk price: -1% to world market
- Feed price: 17% to world market

Key developments 2006-2010

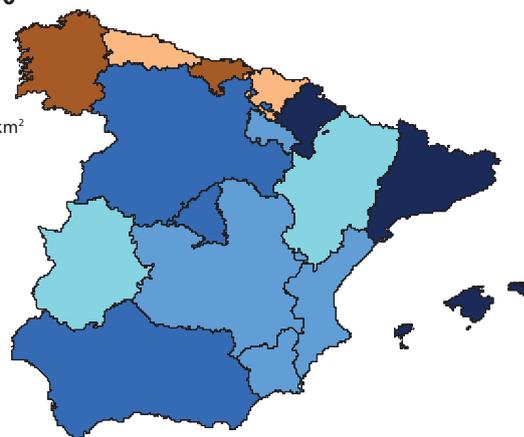
- Milk production growth: +0.5% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 30% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

Milk density 2010

 in tons / km²

 Milk density in tons / km²


■ Canary Islands



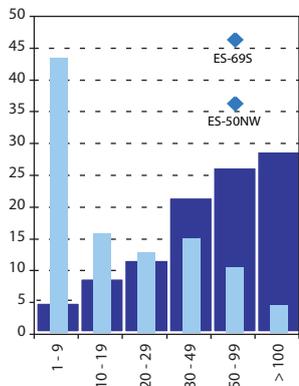
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	5.76	5.66	5.61	6.26	6.34	5.93	6.09	6.06	0.4%	0.5%
Cows (in 1,000's)			1,141	1,436	1,171	992	902	861		-3.5%
Milk yield (t/cow/year)			4.9	4.4	5.4	6.0	6.8	7.0		4.2%
Farm structure										
No. of dairy farms (in 1,000's)				79	64	50	39	33		-10.3%
Average farm size (cows/farm)				18	18	20	23	26		7.6%
Prices in national currency										
Milk : feed price ratio	1.7	2.2	1.9	2.0	1.8	2.0	1.6	1.5	-0.9%	-6.4%
Cull cow (EUR / kg live weight)	0.97	0.94	0.85	0.86	0.80	0.99	1.08	1.20	1.5%	4.9%
Land - buy (EUR / ha)	4,616	6,125	7,292	8,026	9,024	10,402	10,974	10,622	6.1%	0.5%
Quota (EUR / kg milk)	0.21	0.31	0.40	0.37	0.39	0.27	0.27	0.17	-1.4%	-10.6%

Farm structure

% of dairy farms and cows in size classes (2010)

- Cows per size class
- Farms per size class
- ◆ IFCN typical farms*

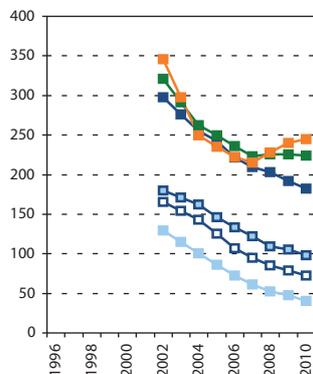


* size class where IFCN typical farms are

Farm structure

cows per herd size (in 1,000's)

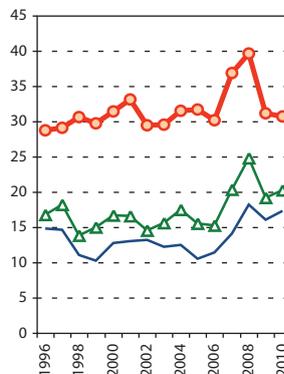
- 1 - 9
- 10 - 19
- 20 - 29
- 30 - 49
- 50 - 99
- > 100



Milk and feed price

EUR / 100 kg

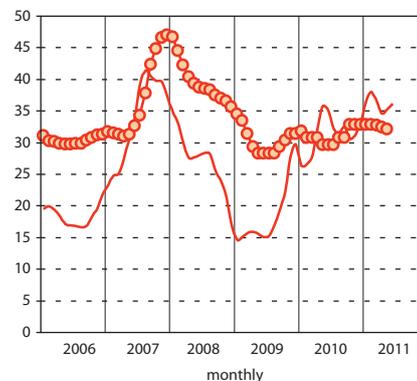
- National milk price
- △ National feed price
- IFCN feed price indicator (world)



Farm gate milk prices

EUR / 100 kg milk (ECM)

- National price
- IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Beef price 2009-2010. Quota price 2009-2010. Land price 2010.

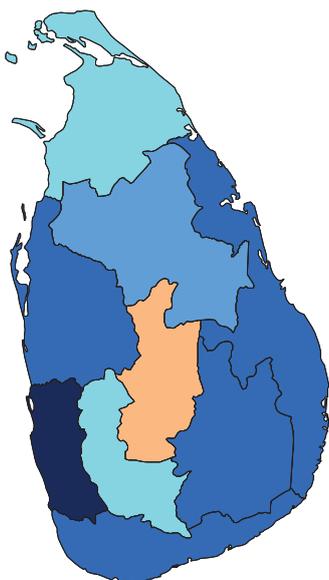
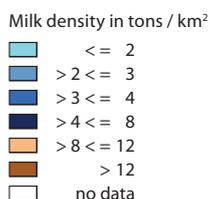


Hemali Kothalawala



Milk density 2009

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's and buffalo's): 0.3 mill t ECM (number 107 in the world)
- No. of dairy farms: 182,000
- Share of milk produced in farms with more than 20 cows: 29% (2008)
- Milk price: -24% to world market
- Feed price: 83% to world market

Key developments 2006-2010

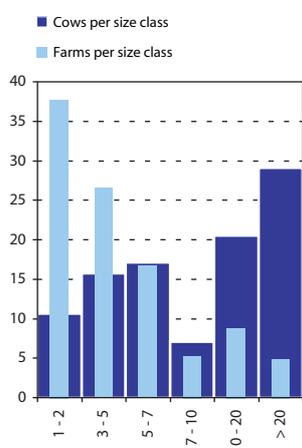
- Milk production growth: +6.6% per year
- Share of time milk price was above world market level: 20%
- Milk price was on average -28% below the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's and buffalo's)										
Production (mill t)	0.19	0.19	0.20	0.20	0.21	0.22	0.23	0.28	2.6%	6.6%
Cows and buffalos (in 1,000's)	1,257	1,228	1,198	1,165	1,129	1,099	1,103	968	-1.8%	-3.1%
Milk yield (t/cow/year)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	4.5%	10.0%
Farm structure										
No. of dairy farms (in 1,000's)	595	479	364	249	176	162	152	182	-8.1%	3.0%
Average farm size (cows/farm)	2	3	3	5	6	7	7	5	6.8%	-5.9%
Prices in national currency										
Milk : feed price ratio		0.8	0.9	0.7	0.6	0.7	0.6	0.7		0.2%
Cull cow (LKR / kg live weight)	20	22	23	27	34	56	115	225	18.9%	41.5%
Land - buy (1,000 LKR / ha)	661	915	1,267	1,754	2,428	3,360	3,800	4,250	14.2%	6.1%

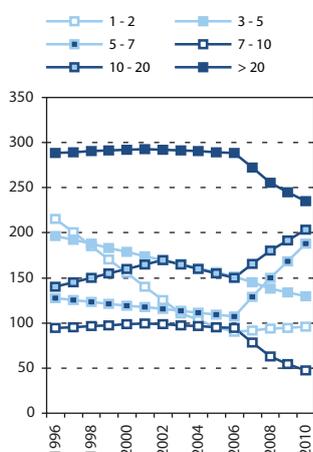
Farm structure

% of dairy farms and cows in size classes (2008)



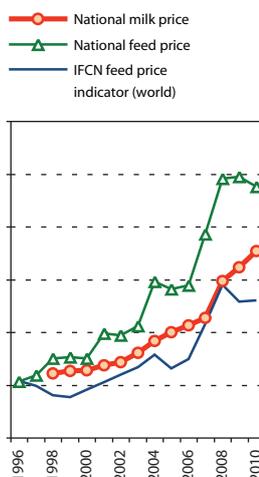
Farm structure

cows per herd size (in 1,000's)



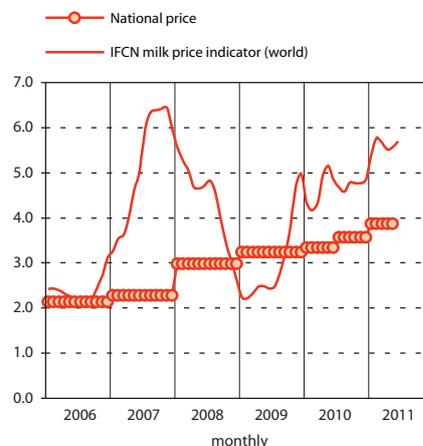
Milk and feed price

1,000 LKR / 100 kg



Farm gate milk prices

1,000 LKR / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, milk production.

Estimates done for: Farm structure: Cow number 2007 by interpolation and 2009-2010 following the trend.



STATUS AND KEY DEVELOPMENTS

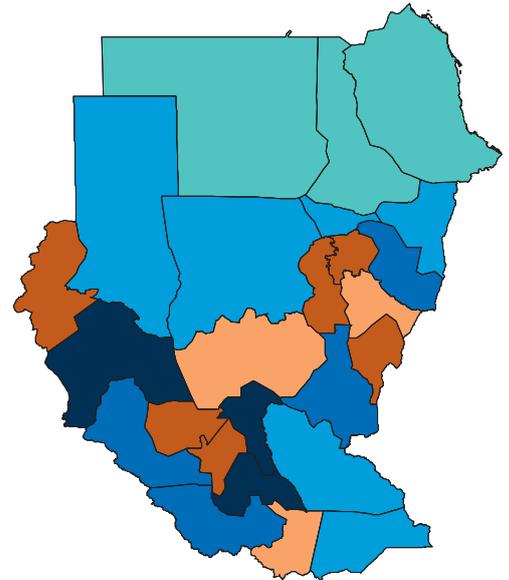
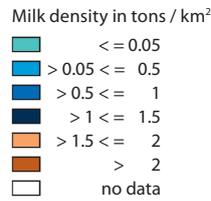
Status 2010

- Milk production (cow's): 5.6 mill t ECM (number 21 in the world)
- Milk price: 41% to world market
- Feed price: 0% to world market

Key developments 2006-2010

- Milk production growth: +0.3% per year
- Share of time milk price was above world market level: 100%
- Milk price was on average 48% above the world market
- Share of time feed price was above world market level: 20%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

Milk density 2001
in tons / km²



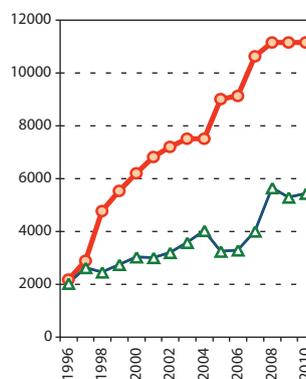
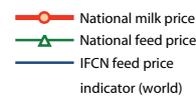
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	3.78	3.94	5.25	5.57	5.51	5.55	5.58	5.58	2.8%	0.2%
Cows (in 1,000's)	6,100	6,600	9,300	11,000	14,011	14,972	14,350	14,450	6.4%	-0.9%
Milk yield (t/cow/year)	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.4	-3.3%	1.1%
Farm structure										
No. of dairy farms (in 1,000's)										
Average farm size (cows/farm)										
Prices in national currency										
Milk : feed price ratio	1.1	1.9	2.1	2.3	1.9	2.8	2.0	2.1	4.8%	-7.3%
Cull cow (SDD / kg live weight)										
Land - buy (SDD / ha)										



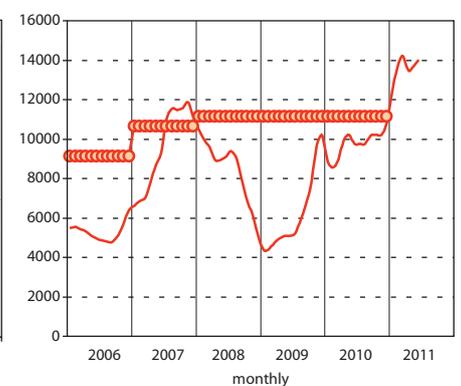
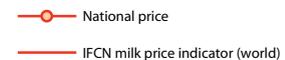
Milk and feed price

SDD / 100 kg



Farm gate milk prices

SDD / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2001, milk production.

Estimates done for: Milk production, cow number and milk price 2010. Monthly milk prices 1996-2010: Annual averages. Dairy farm numbers based on the assumption that the average herd size is 25 cows / farm (pastoral / agro-pastoral systems).

Remarks: Since no statistical information on soybean meal and corn prices 1996-2010 are available the world market prices are used.



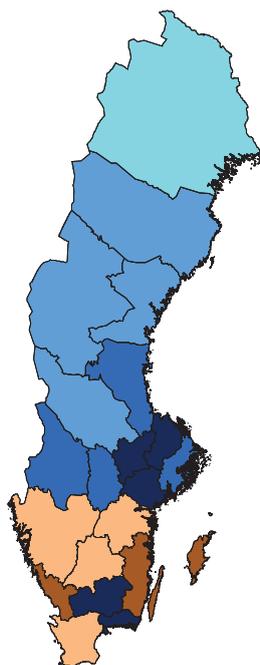
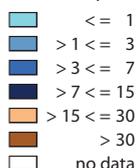
Agneta Hjellström



Milk density 2010

in tons / km²

Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 3 mill t ECM (number 37 in the world)
- No. of dairy farms: 5,697
- Share of milk produced in farms with more than 50 cows: 74%
- Milk price: 5% to world market
- Feed price: 34% to world market

Key developments 2006-2010

- Milk production growth: -2.1% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 17% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 20%

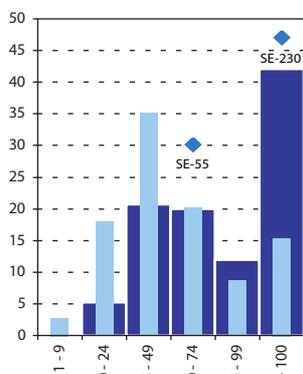
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	3.66	3.67	3.44	3.37	3.41	3.30	3.15	3.04	-1.3%	-2.1%
Cows (in 1,000's)	466	449	428	417	404	388	357	348	-2.1%	-2.6%
Milk yield (t/cow/year)	7.9	8.2	8.0	8.1	8.4	8.5	8.8	8.7	0.8%	0.6%
Farm structure										
No. of dairy farms (in 1,000's)	16	14	12	11	9	8	7	6	-7.1%	-8.4%
Average farm size (cows/farm)	29	32	35	40	44	48	54	61	5.4%	6.3%
Prices in national currency										
Milk : feed price ratio	2.0	1.8	1.9	1.7	1.5	1.5	1.5	1.4	-2.3%	-2.4%
Cull cow (SEK / kg live weight)		7.36	7.10	8.20	7.64	8.66	9.11	9.13		1.3%
Land - buy (SEK / ha)	11,600	14,600	16,800	18,500	22,400	34,300	40,200	46,200	10.4%	7.7%
Quota (SEK / kg milk)	1.50	1.50	1.04	1.04	0.78	0.81	0.04	0.04	-23.2%	-53.8%

Farm structure

% of dairy farms and cows in size classes (2010)

■ Cows per size class
■ Farms per size class
◆ IFCN typical farms*

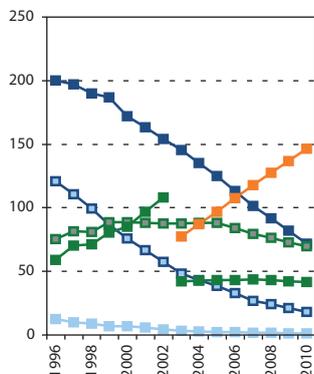


* size class where IFCN typical farms are

Farm structure

cows per herd size (in 1,000's)

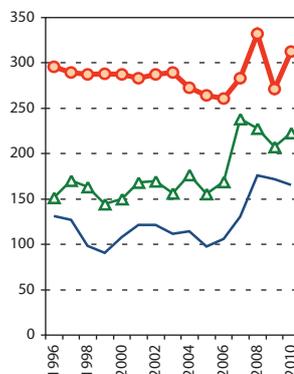
■ 1 - 9 ■ 10 - 24
■ 25 - 49 ■ 50 - 74
■ 75 - 99 ■ > 100



Milk and feed price

SEK / 100 kg

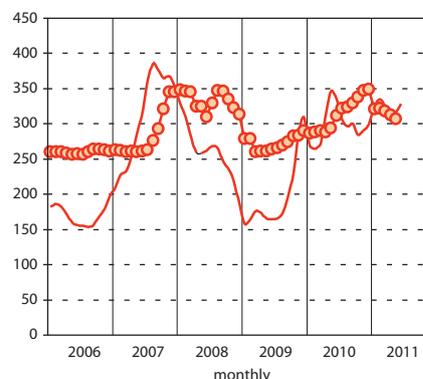
○ National milk price
△ National feed price
— IFCN feed price indicator (world)



Farm gate milk prices

SEK / 100 kg milk (ECM)

○ National price
— IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Remarks: Monthly milk prices 2011 preliminary since the yearly payments are not included (are paid at the end of the year).





STATUS AND KEY DEVELOPMENTS

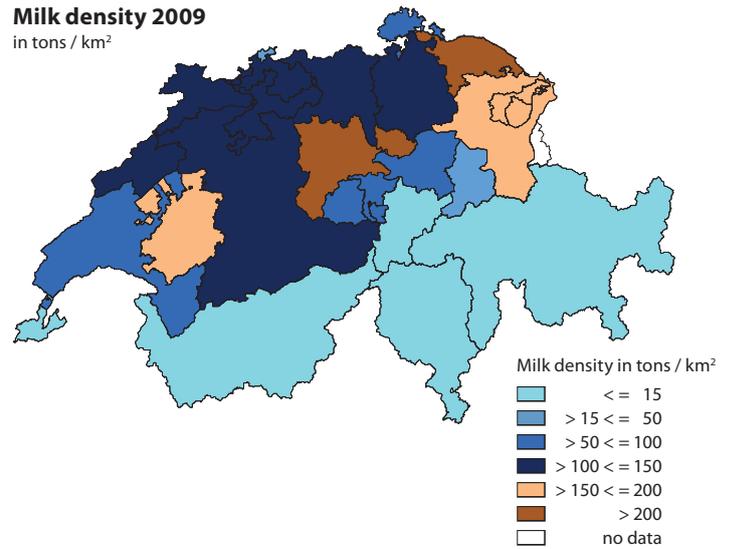
Status 2010

- Milk production (cow's): 4.1 mill t ECM (number 33 in the world)
- No. of dairy farms: 27,000
- Share of milk produced in farms with more than 50 cows: 10%
- Milk price: 43% to world market
- Feed price: 117% to world market

Key developments 2006-2010

- Milk production growth: +1.5% per year
- Share of time milk price was above world market level: 100%
- Milk price was on average 73% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

Milk density 2009
in tons / km²

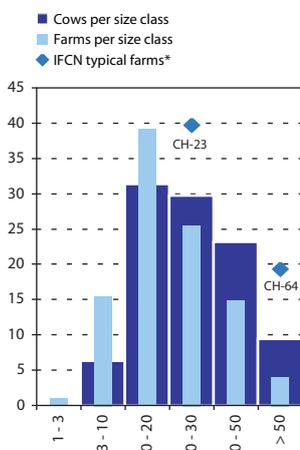


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	3.81	3.85	3.83	3.88	3.87	3.88	4.12	4.12	0.6%	1.5%
Cows (in 1,000's)	755	727	714	716	691	565	578	555	-2.2%	-0.5%
Milk yield (t/cow/year)	5.0	5.3	5.4	5.4	5.6	6.9	7.1	7.4	2.8%	2.0%
Farm structure										
No. of dairy farms (in 1,000's)	55	52	48	46	43	29	28	27	-4.9%	-1.7%
Average farm size (cows/farm)	14	14	15	16	16	20	21	21	2.9%	1.3%
Prices in national currency										
Milk : feed price ratio	1.3	1.3	1.3	1.4	1.3	1.3	1.4	1.2	-0.6%	-2.2%
Cull cow (CHF / kg live weight)	1.47	2.15	3.02	2.04	2.92	3.08	3.37	3.01	5.3%	-0.6%
Land - buy (CHF / ha)	70,000	70,000	70,000	70,000	70,000	70,000	70,000	70,000	0.0%	0.0%
Quota (CHF / kg milk)			1.30	1.31	1.11	1.09	0.72	0.40		

Farm structure

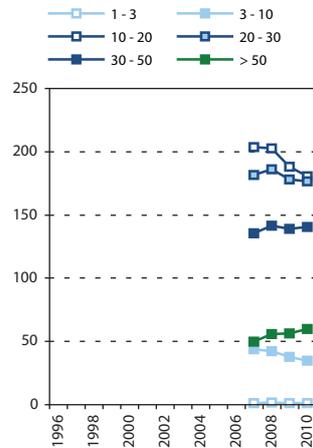
% of dairy farms and cows in size classes (2009)



* size class where IFCN typical farms are

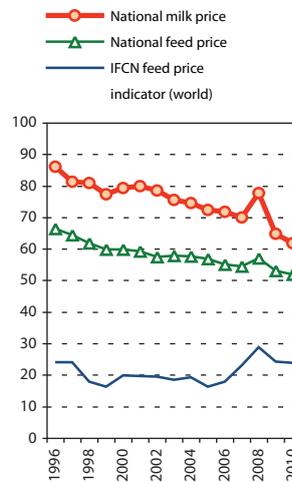
Farm structure

cows per herd size (in 1,000's)



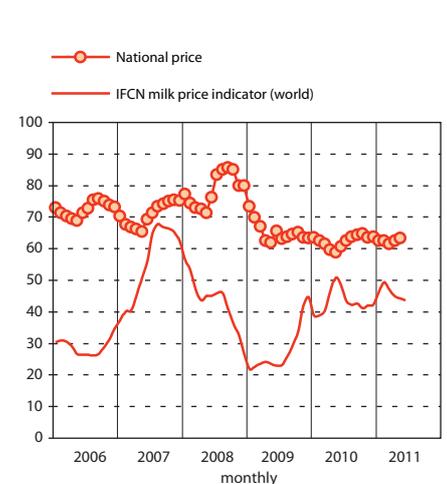
Milk and feed price

CHF / 100 kg



Farm gate milk prices

CHF / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

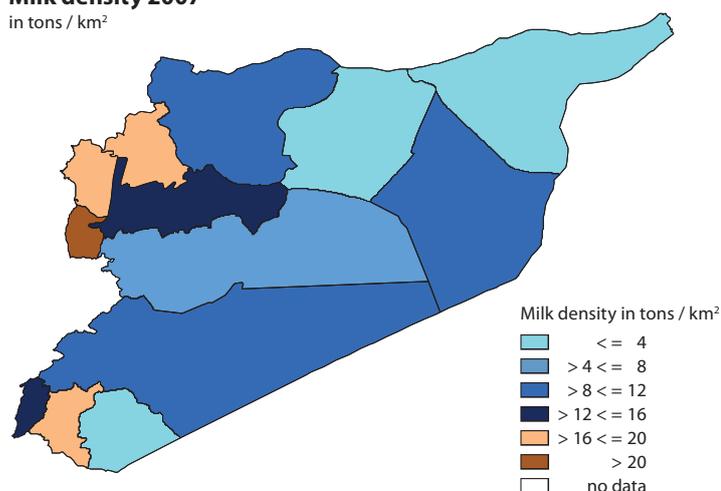
Milk map details: Data based on the year 2009, milk delivered.

Estimates done for: Cow number 2010 (farm structure) and quota price 2010 following the trend. Land prices due to very diverse landscape (mountain, plain).

Remarks: Dairy farm numbers 1996-2005 include dairy and suckler cow farms, afterwards just pure dairy farms.

Milk density 2007

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

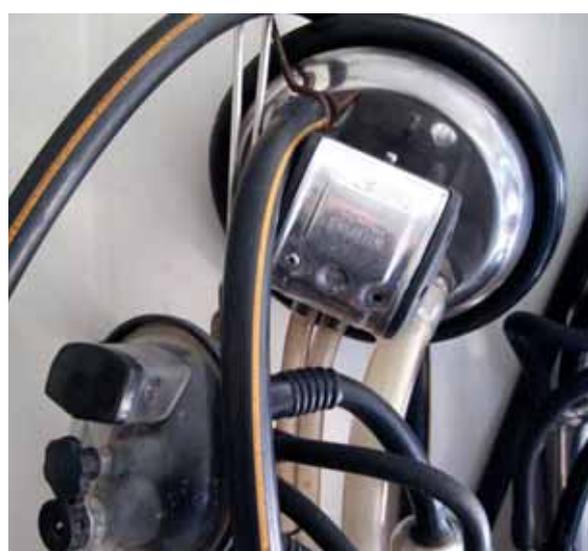
- Milk production (cow's): 1.7 mill t ECM (number 39 in the world)
- Milk price: 12% to world market
- Feed price: 33% to world market

Key developments 2006-2010

- Milk production growth: +0.7% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 11% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 60%

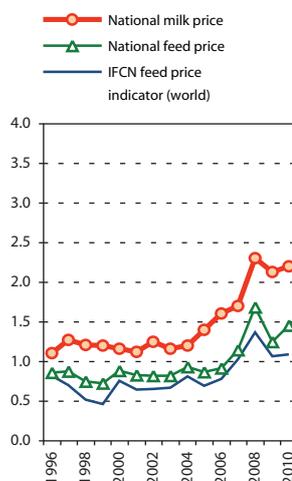
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.93	1.12	1.16	1.17	1.36	1.62	1.61	1.66	4.2%	0.7%
Cows (in 1,000's)	554	644	672	604	701	773	780	774	2.4%	0.0%
Milk yield (t/cow/year)	1.7	1.7	1.7	1.9	1.9	2.1	2.1	2.1	1.7%	0.7%
Farm structure										
No. of dairy farms (in 1,000's)	185	215	224	201	234	242	236	221	1.8%	-0.7%
Average farm size (cows/farm)	3.0	3.0	3.0	3.0	3.0	3.2	3.3	3.5	0.6%	0.7%
Prices in national currency										
Milk : feed price ratio	1.3	1.6	1.3	1.5	1.3	1.8	1.4	1.5	1.2%	-3.6%
Cull cow (SYP / kg live weight)										
Land - buy (1,000 SYP / ha)					70	100	300	324		34.2%



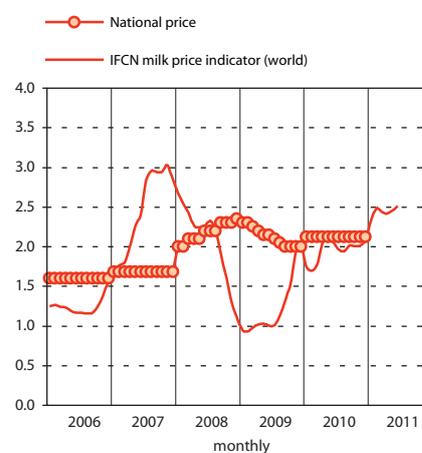
Milk and feed price

1,000 SYP / 100 kg



Farm gate milk prices

1,000 SYP / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2007, milk production.

Estimates done for: Milk production, cow numbers and monthly milk prices 2009-2010. Dairy farms based on the assumption that the average herd size is 3 - 3.5 cows / farm. Land prices 2004-2010. Monthly milk prices 2006-07 and 2010: annual averages.

Remarks: Since no statistical information on soybean meal prices are available the world market price is used.



Xenia Hsiao



3.87 Taiwan – Milk production fact sheet

STATUS AND KEY DEVELOPMENTS

Status 2010

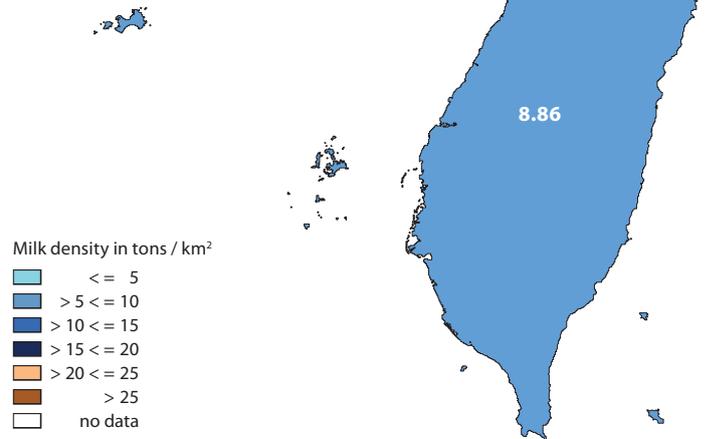
- Milk production (cow's): 0.3 mill t ECM (number 103 in the world)
- No. of dairy farms: 610
- Share of milk produced in farms with more than 50 cows: 99%
- Milk price: 88% to world market
- Feed price: 46% to world market

Key developments 2006-2010

- Milk production growth: +0.4% per year
- Share of time milk price was above world market level: 100%
- Milk price was on average 99% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

Milk density 2009

in tons / km²

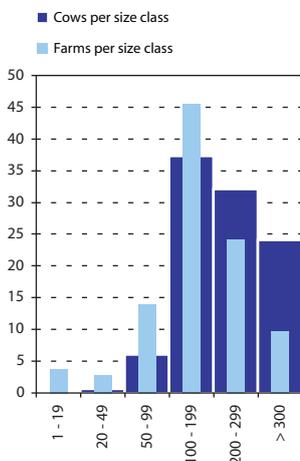


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.31	0.34	0.36	0.36	0.32	0.32	0.31	0.33	0.3%	0.4%
Cows (in 1,000's)	63	67	66	65	55	52	54	52	-1.4%	-0.2%
Milk yield (t/cow/year)	5.0	5.0	5.4	5.5	5.9	6.1	5.8	6.3	1.7%	0.6%
Farm structure										
No. of dairy farms (in 1,000's)	0.84	0.87	0.82	0.75	0.67	0.64	0.61	0.61	-2.3%	-1.0%
Average farm size (cows/farm)	75	77	81	86	81	82	89	85	0.9%	0.8%
Prices in national currency										
Milk : feed price ratio	2.4	2.7	3.1	3.4	2.4	2.7	1.9	2.3	-0.1%	-3.9%
Cull cow (TWD / kg live weight)		69	67	61	79	102	100	94		-1.9%
Land - buy (1,000 TWD / ha)										

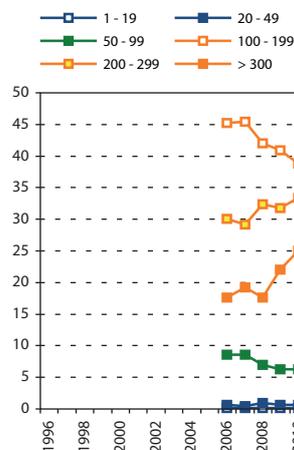
Farm structure

% of dairy farms and cows in size classes (2010)



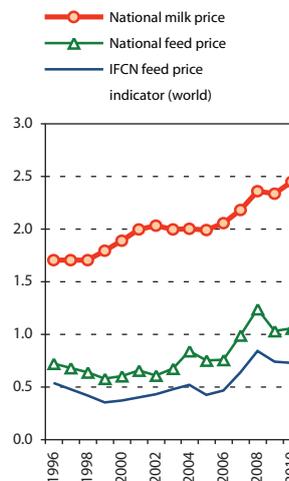
Farm structure

cows per herd size (in 1,000's)



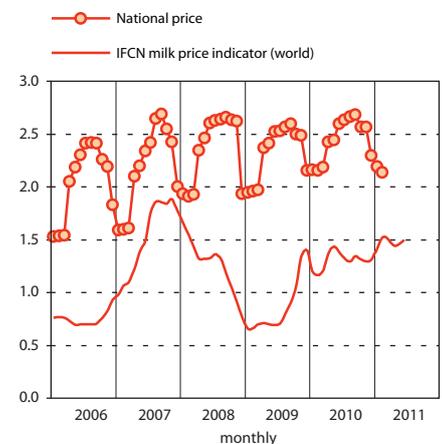
Milk and feed price

1,000 TWD / 100 kg



Farm gate milk prices

1,000 TWD / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, milk production.

Estimates done for: Milk production and cow numbers 2010 following the trend. Dairy farm numbers 2009-2010 following the trend.

Remarks: Farm structure: cow number is the total number of cattle in farms.

3.88 Thailand – Milk production fact sheet



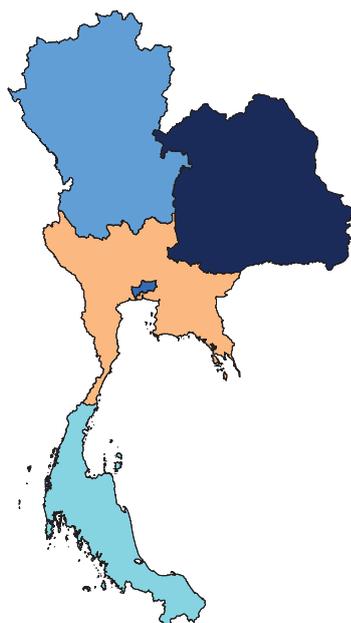
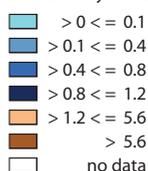
Adul Vangtal



Milk density 2008

in tons / km²

Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 0.9 mill t ECM (number 72 in the world)
- No. of dairy farms: 19,000
- Share of milk produced in farms with more than 20 cows: 58% (2004)
- Milk price: 22% to world market
- Feed price: 35% to world market

Key developments 2006-2010

- Milk production growth: +3.9% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 25% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 40%

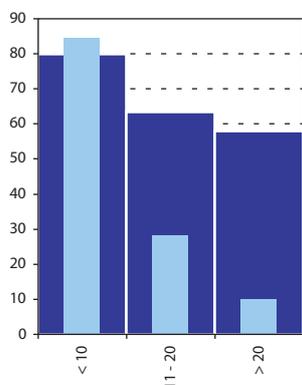
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.39	0.43	0.52	0.65	0.84	0.80	0.78	0.93	6.4%	3.9%
Cows (in 1,000's)	116	132	146	159	203	215	208	280	6.5%	6.8%
Milk yield (t/cow/year)	3.3	3.3	3.5	4.1	4.1	3.7	3.7	3.3	0.0%	-2.8%
Farm structure										
No. of dairy farms (in 1,000's)	17	17	19	21	24	21	19	19	0.8%	-2.5%
Average farm size (cows/farm)	7	8	8	8	8	10	11	15	5.7%	9.5%
Prices in national currency										
Milk : feed price ratio	1.7	1.8	1.8	1.7	1.6	1.3	1.4	1.6	-0.4%	5.0%
Cull cow (THB / kg live weight)					27	35	34	35		0.0%
Land - buy (1,000 THB / ha)	1,300	1,300	1,300	1,300	1,300	1,300	1,300	1,350	0.3%	0.9%

Farm structure

% of dairy farms and cows in size classes (2004)

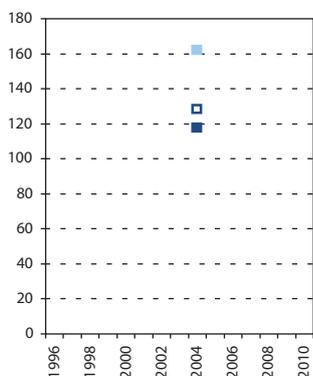
■ Cows per size class
■ Farms per size class



Farm structure

cows per herd size (in 1,000's)

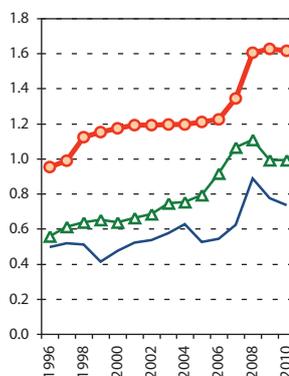
■ < 10
■ 11 - 20
■ > 20



Milk and feed price

1,000 THB / 100 kg

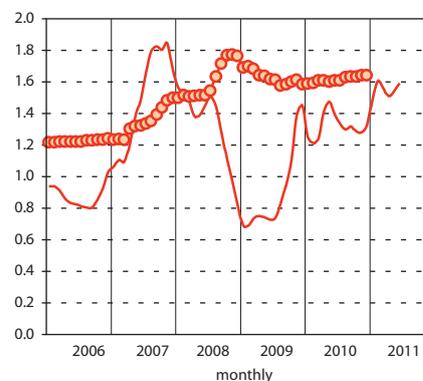
○ National milk price
△ National feed price
— IFCN feed price indicator (world)



Farm gate milk prices

1,000 THB / 100 kg milk (ECM)

○ National price
— IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2008, milk production.



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 1.1 mill t ECM (number 67 in the world)
- No. of dairy farms: 112,000
- Share of milk produced in farms with more than 50 cows: 7%
- Milk price: 2% to world market
- Feed price: 11% to world market

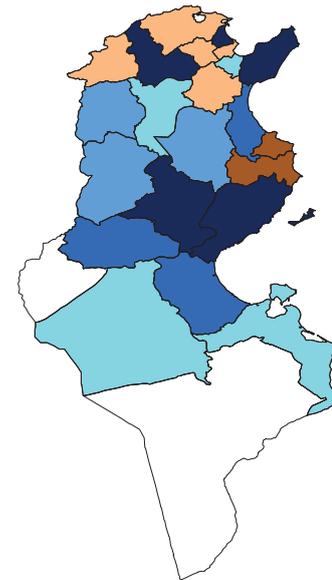
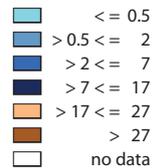
Key developments 2006-2010

- Milk production growth: +3.4% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 22% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 80%

Milk density 2010

in tons / km²

Milk density in tons / km²

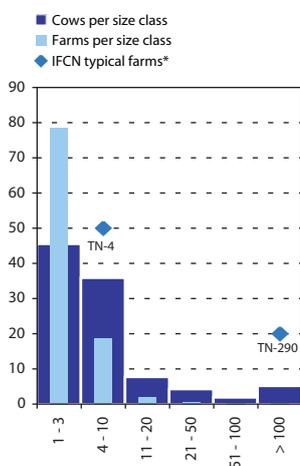


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.61	0.73	0.88	0.93	0.85	0.95	1.03	1.08	4.2%	3.4%
Cows (in 1,000's)	409	463	482	485	435	480	530	565	2.3%	4.2%
Milk yield (t/cow/year)	1.5	1.6	1.8	1.9	2.0	2.0	1.9	1.9	1.8%	-0.7%
Farm structure										
No. of dairy farms (in 1,000's)								112		
Average farm size (cows/farm)								5		
Prices in national currency										
Milk : feed price ratio	1.8	2.3	2.1	2.1	1.7	2.1	1.4	1.6	-0.8%	-5.9%
Cull cow (TND / kg live weight)						1.50	2.08	2.31		11.4%
Land - buy (TND / ha)										

Farm structure

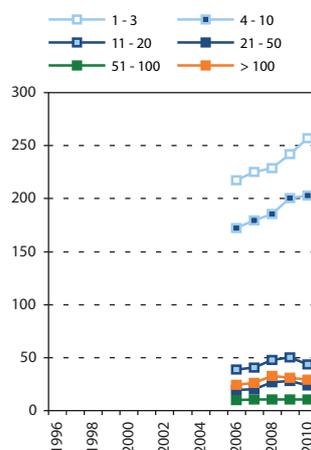
% of dairy farms and cows in size classes (2010)



* size class where IFCN typical farms are

Farm structure

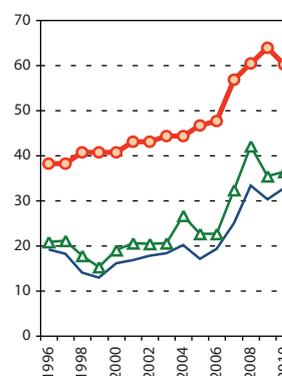
cows per herd size (in 1,000's)



Milk and feed price

TND / 100 kg

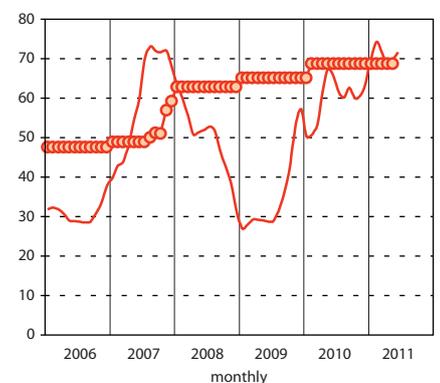
○ National milk price
△ National feed price
— IFCN feed price indicator (world)



Farm gate milk prices

TND / 100 kg milk (ECM)

○ National price
— IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

3.90 Turkey – Milk production fact sheet



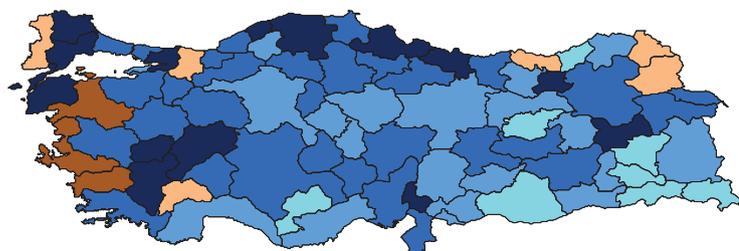
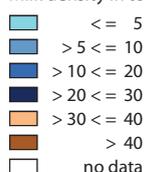
Cagla Yuksel
Kaya-Kuyululu

Freelancer

Milk density 2009

in tons / km²

Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's and buffalo's): 12.1 mill t ECM (number 11 in the world)
- No. of dairy farms: 1,089,000
- Share of milk produced in farms with more than 50 cows: 12% (2009)
- Milk price: 43% to world market
- Feed price: 46% to world market

Key developments 2006-2010

- Milk production growth: +3.3% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 26% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 20%

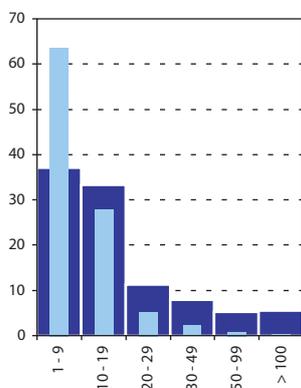
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's and buffalo's)										
Production (mill t)	10.14	9.46	9.30	7.87	9.07	10.57	10.75	12.06	1.2%	3.3%
Cows and buffalos (in 1,000's)	6,082	5,574	5,349	4,444	3,915	4,224	4,111	4,420	-2.3%	1.1%
Milk yield (t/cow/year)	1.7	1.7	1.7	1.8	2.3	2.5	2.6	2.7	3.6%	2.2%
Farm structure										
No. of dairy farms (in 1,000's)				2,170	2,217	1,665	1,089	1,089		-10.1%
Average farm size (cows/farm)				2.0	1.8	2.5	3.8	4.1		12.5%
Prices in national currency										
Milk : feed price ratio	1.0	1.8	1.7	1.5	1.3	1.2	1.0	1.8	3.9%	9.5%
Cull cow (TRY / kg live weight)						3.40	3.80	6.50		17.6%
Land - buy (TRY / ha)						20,000	30,000	34,642		14.7%

Farm structure

% of dairy farms and cows in size classes (2008)

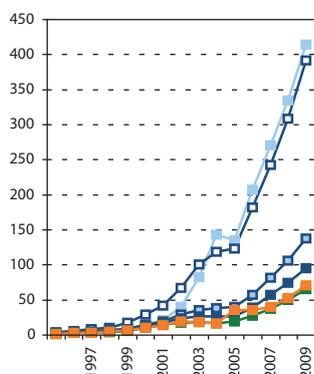
■ Cows per size class
■ Farms per size class



Farm structure

cows per herd size (in mill)

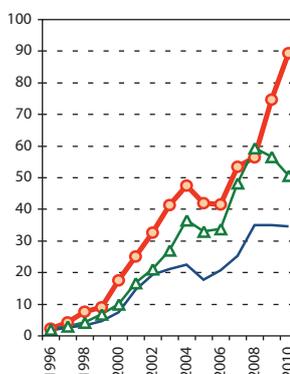
■ 1-9 ■ 10-19
■ 20-29 ■ 30-49
■ 50-99 ■ >100



Milk and feed price

TRY / 100 kg

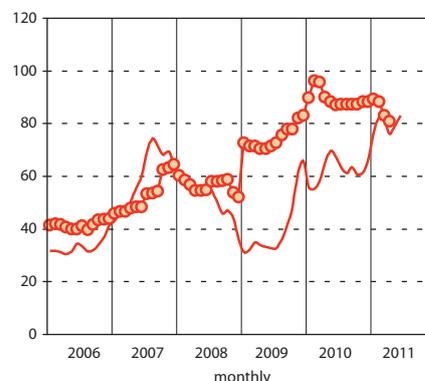
● National milk price
▲ National feed price
— IFCN feed price indicator (world)



Farm gate milk prices

TRY / 100 kg milk (ECM)

● National price
— IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2009, cow milk production.

Estimates done for: Farm structure: Cow number 2009-2010 following the trend. Dairy farm numbers 2008-2010.

Soybean meal price 1996-1999 estimated based on world market price development.

Remarks: The farm structure is based on herd book data. The herd book program is promoted by the government and has only a history of 14 years in Turkey.

The farm structure shows the female cattle on the farm.



STATUS AND KEY DEVELOPMENTS

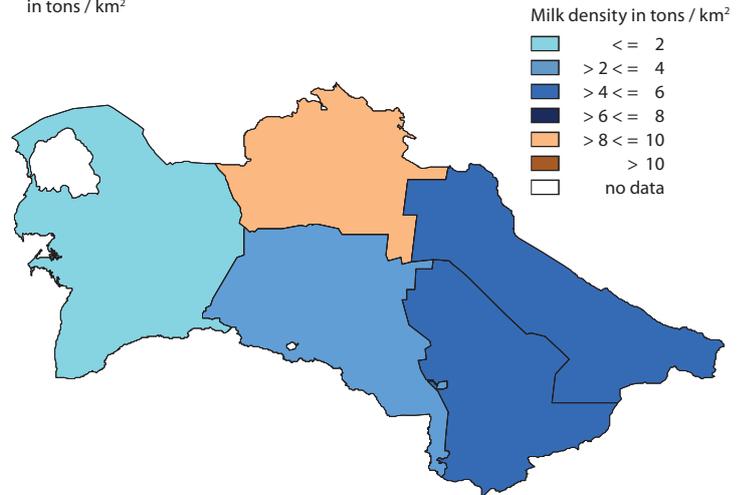
Status 2010

- Milk production (cow's): 1.1 mill t ECM (number 69 in the world)
- No. of dairy farms: 83,511 (2007)
- Share of milk produced in farms the state sector: 3% (2007)
- Milk price: 15% to world market
- Feed price: 0% to world market

Key developments 2006-2010

- Milk production growth: -2.9% per year
- Share of time milk price was above world market level: 100%
- Milk price was on average 51% above the world market
- Share of time feed price was above world market level: 20%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

Milk density 2004
in tons / km²

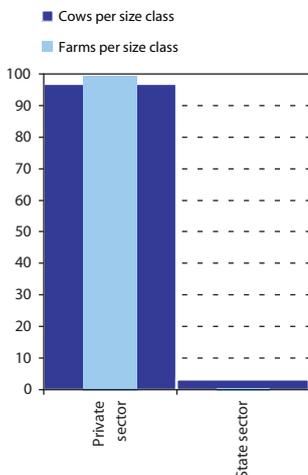


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.75	0.77	0.99	1.40	1.40	1.20	1.33	1.06	2.5%	-2.9%
Cows (in 1,000's)	567	485	620	770	1,000	1,032	974	974	3.9%	-1.4%
Milk yield (t/cow/year)	1.3	1.6	1.6	1.8	1.4	1.2	1.4	1.1	-1.4%	-1.5%
Farm structure										
No. of dairy farms (in 1,000's)							2007: 83			
Average farm size (cows/farm)							12			
							16			
Prices in national currency										
Milk : feed price ratio		4.3	8.9	7.3	10.3	10.1	2.7	4.0		-20.6%
Cull cow (TMT / kg live weight)										
Land - buy (TMT / ha)										

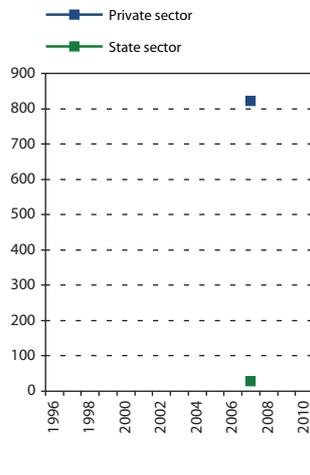
Farm structure

% of dairy farms and cows in size classes (2007)



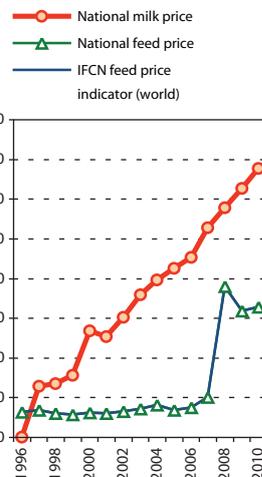
Farm structure

cows per herd size (in 1,000's)



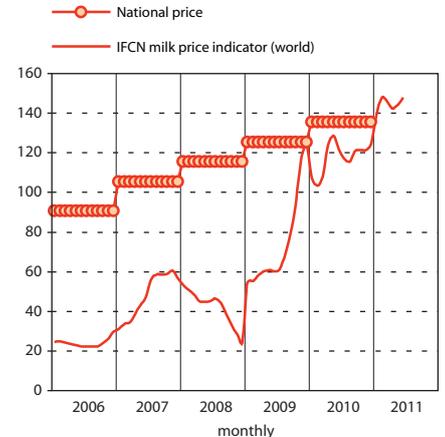
Milk and feed price

TMT / 100 kg



Farm gate milk prices

TMT / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

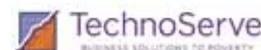
Milk map details: Data based on the year 2004, milk production.

Estimates done for: Milk production and milk price 2010. Monthly milk prices: annual prices.

Remarks: Farm structure information based on national surveys whereas the cow number in the table is based on FAO.



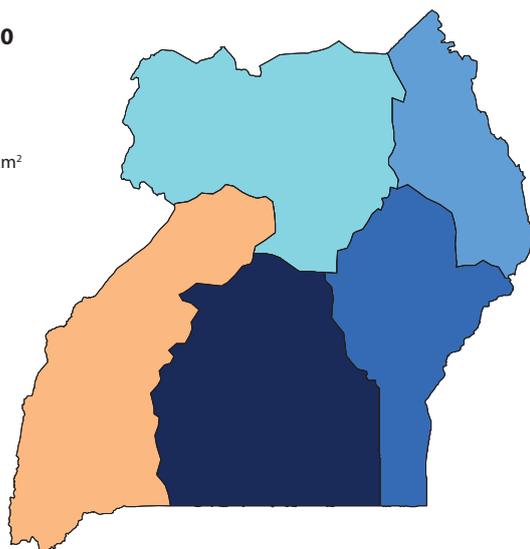
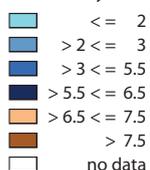
David Balikowa



Milk density 2010

in tons / km²

Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 1.2 mill t ECM (number 56 in the world)
- No. of dairy farms: 1,663,000
- Milk price: -55% to world market
- Feed price: 43% to world market

Key developments 2006-2010

- Milk production growth: +5.5% per year
- Share of time milk price was above world market level: 0%
- Milk price was on average -52% below the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

Key variables

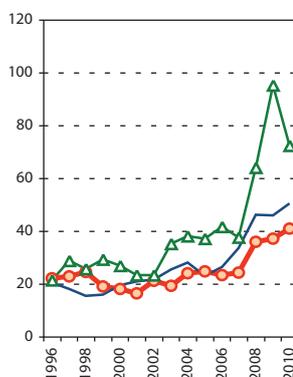
	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates					
									1996-2010	2006-10				
Milk production in ECM (cow's)														
Production (mill t)	0.62	0.66	0.74	0.82	0.90	0.99	1.05	1.23	5.1%	5.5%				
Cows (in 1,000's)	1,325	1,413	1,492	1,582	1,700	2,767	3,721	4,293	8.8%	11.6%				
Milk yield (t/cow/year)	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.3	-3.4%	-5.5%				
Farm structure														
No. of dairy farms (in 1,000's)									801	941	1,106	1,300	1,663	10.7%
Average farm size (cows/farm)									2.0	1.8	2.5	2.9	2.6	0.8%
Prices in national currency														
Milk : feed price ratio	1.0	0.9	0.7	0.9	0.6	0.6	0.6	0.6	-4.1%	0.2%				
Cull cow (UGX / kg live weight)	700	750	780	800	900	1,000	1,714	2,661	10.0%	27.7%				
Land - buy (1,000 UGX / ha)	300	400	500	750	1,235	1,850	2,470	4,551	21.4%	25.2%				



Milk and feed price

1,000 UGX / 100 kg

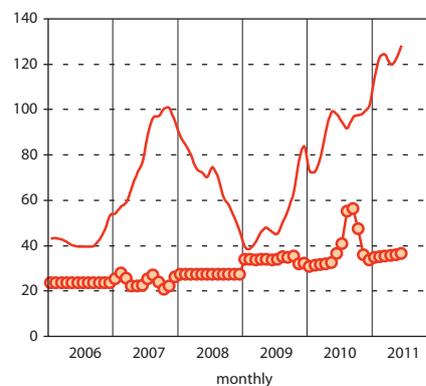
- National milk price
- △— National feed price
- IFCN feed price indicator (world)



Farm gate milk prices

1,000 UGX / 100 kg milk (ECM)

- National price
- IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Monthly milk prices 2006 and 2008: annual averages.





Olga Kozak



STATUS AND KEY DEVELOPMENTS

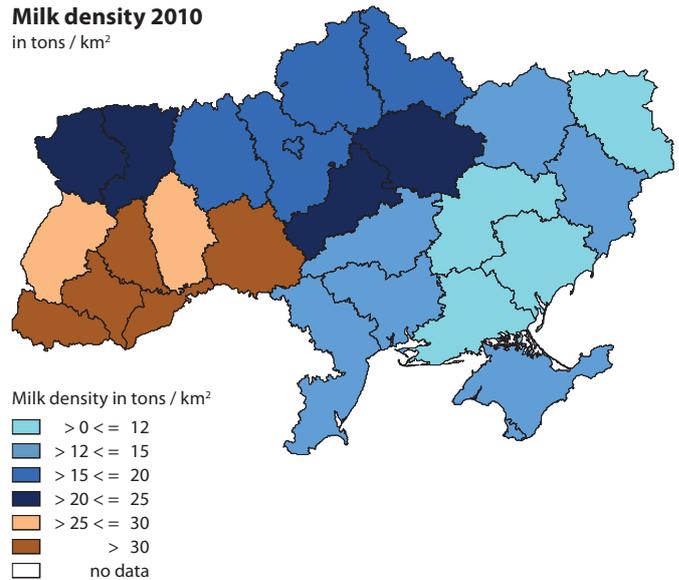
Status 2010

- Milk production (cow's): 11.2 mill t ECM (number 15 in the world)
- No. of dairy farms: 1,865,074
- Share of milk produced in farms with more than 50 cows: 21%
- Milk price: -5% to world market
- Feed price: -22% to world market

Key developments 2006-2010

- Milk production growth: -4.1% per year
- Share of time milk price was above world market level: 0%
- Milk price was on average -14% below the world market
- Share of time feed price was above world market level: 20%
- Share of time milk : feed price ratio was above 1.5 (favourable): 80%

Milk density 2010
in tons / km²

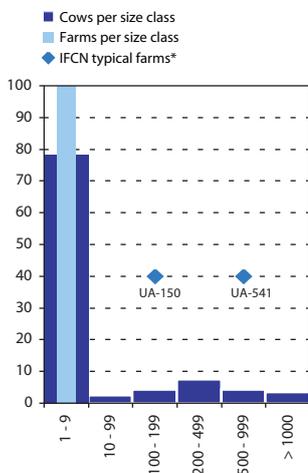


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	14.81	13.63	12.56	14.03	13.68	13.18	11.67	11.17	-2.0%	-4.1%
Cows (in 1,000's)	6,972	5,841	4,958	4,716	3,926	3,347	2,920	2,677	-6.6%	-5.4%
Milk yield (t/cow/year)	2.1	2.3	2.5	3.0	3.5	3.9	4.0	4.2	4.9%	1.4%
Farm structure										
No. of dairy farms (in 1,000's)	2,443	2,459	2,735	2,803	2,610	2,476	2,305	1,865	-1.9%	-6.8%
Average farm size (cows/farm)	2.9	2.4	1.8	1.7	1.5	1.4	1.3	1.4	-4.8%	1.5%
Prices in national currency										
Milk : feed price ratio	1.1	1.3	1.2	1.2	1.3	1.6	1.6	2.2	5.1%	8.1%
Cull cow (UAH / kg live weight)	0.83	1.24	2.07	2.92	5.15	5.29	9.41	9.42	18.9%	15.5%
Land - rent (UAH / ha)				85	104	120	185	292		24.9%

Farm structure

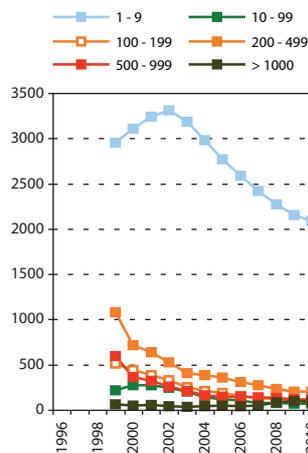
% of dairy farms and cows in size classes (2010)



* size class where IFCN typical farms are

Farm structure

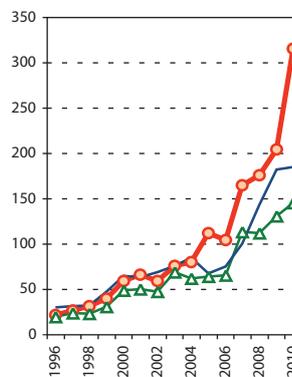
cows per herd size (in 1,000's)



Milk and feed price

UAH / 100 kg

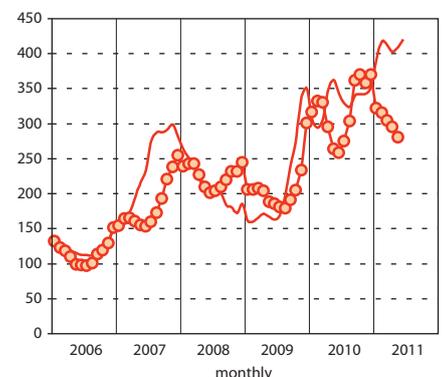
○ National milk price
△ National feed price
— IFCN feed price indicator (world)



Farm gate milk prices

UAH / 100 kg milk (ECM)

○ National price
— IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Dairy farm number 2010.



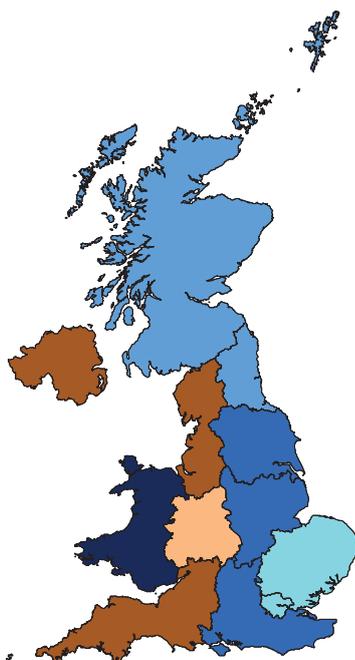
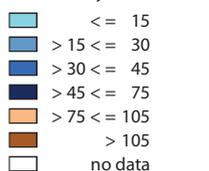
Karolina Klaskova



Milk density 2010

in tons / km²

Milk density in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 13.8 mill t ECM (number 10 in the world)
- No. of dairy farms: 15,700
- Share of milk produced in farms with more than 50 cows: 92%
- Milk price: -10% to world market
- Feed price: 3% to world market

Key developments 2006-2010

- Milk production growth: -0.8% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average 8% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

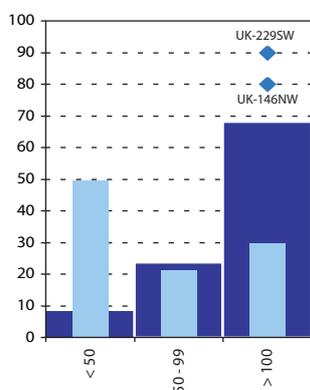
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	14.71	14.76	14.51	14.65	14.37	14.26	13.75	13.81	-0.5%	-0.8%
Cows (in 1,000's)	2,511	2,439	2,336	2,227	2,129	2,066	1,909	1,847	-2.2%	-2.8%
Milk yield (t/cow/year)	5.9	6.1	6.2	6.6	6.8	6.9	7.2	7.5	1.8%	2.0%
Farm structure										
No. of dairy farms (in 1,000's)	37	35	32	25	22	19	17	16	-6.0%	-4.7%
Average farm size (cows/farm)	67	70	73	89	98	109	112	118	4.1%	2.0%
Prices in national currency										
Milk : feed price ratio	1.8	2.0	1.8	2.0	1.8	1.9	1.5	1.6	-1.1%	-5.0%
Cull cow (GBP / kg live weight)	0.52	0.38	0.39	0.40	0.43	0.56	0.83	0.85	3.6%	11.2%
Land - buy (GBP / ha)	4,700	5,555	6,450	7,396	7,312	6,361	9,866	10,792	6.1%	14.1%
Quota (GBP / kg milk)	0.63	0.41	0.24	0.10	0.15	0.02	0.01	0.00	-32.7%	-42.4%

Farm structure

% of dairy farms and cows in size classes (2009)

- Cows per size class
- Farms per size class
- ◆ IFCN typical farms*

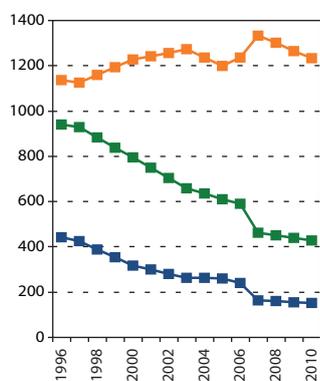


* size class where IFCN typical farms are

Farm structure

cows per herd size (in 1,000's)

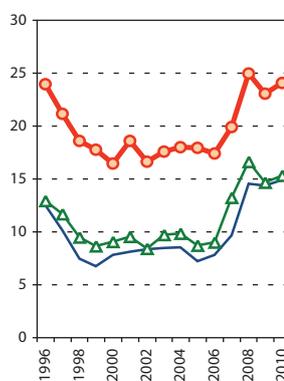
- < 50
- 50 - 99
- > 100



Milk and feed price

GBP / 100 kg

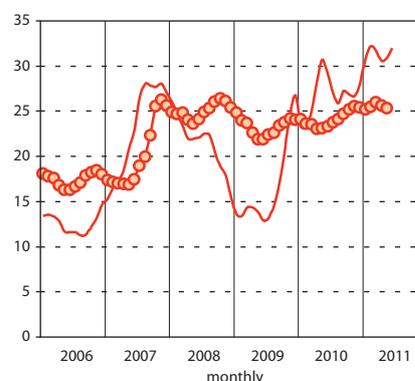
- National milk price
- △ National feed price
- IFCN feed price indicator (world)



Farm gate milk prices

GBP / 100 kg milk (ECM)

- National price
- IFCN milk price indicator (world)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Farm structure: Cow number 2010 following the trend.

Remarks: Land prices: Average of England, Wales, Scotland, Northern Ireland.





STATUS AND KEY DEVELOPMENTS

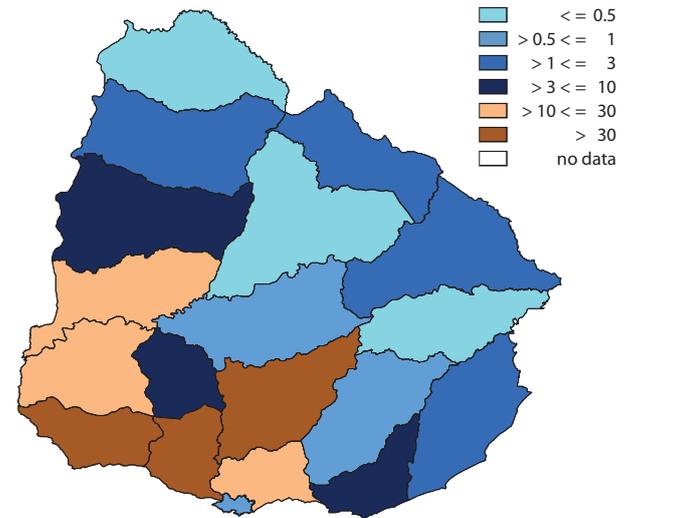
Status 2010

- Milk production (cow's): 1.8 mill t ECM (number 51 in the world)
- No. of dairy farms: 6,000
- Share of milk produced in farms with more than 50 cows: 77% (2000)
- Milk price: -23% to world market
- Feed price: 27% to world market

Key developments 2006-2010

- Milk production growth: +1.4% per year
- Share of time milk price was above world market level: 0%
- Milk price was on average -26% below the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 0%

Milk density 2008
in tons / km²

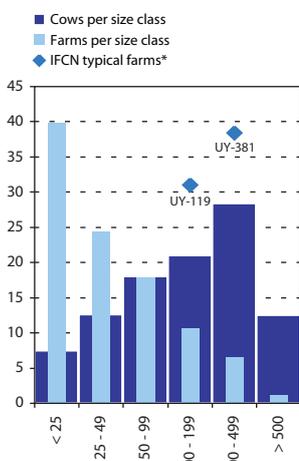


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	1.23	1.39	1.29	1.37	1.57	1.71	1.77	1.81	2.8%	1.4%
Cows (in 1,000's)	380	394	403	443	389	400	409	428	0.9%	1.7%
Milk yield (t/cow/year)	3.2	3.5	3.2	3.1	4.0	4.3	4.3	4.2	1.9%	-0.3%
Farm structure										
No. of dairy farms (in 1,000's)			6.5	6.7	6.0	6.0	6.0	6.0		0.2%
Average farm size (cows/farm)			62	67	64	67	68	71		1.5%
Prices in national currency										
Milk : feed price ratio	0.9	1.1	0.9	0.5	0.9	1.0	1.0	1.1	1.2%	2.4%
Cull cow (UYU / kg live weight)	4.83	7.77	7.74	8.75	21.03	20.06	24.10	26.01	12.8%	6.7%
Land - buy (1,000 UYU / ha)			8	13	21	28	39	50		15.2%

Farm structure

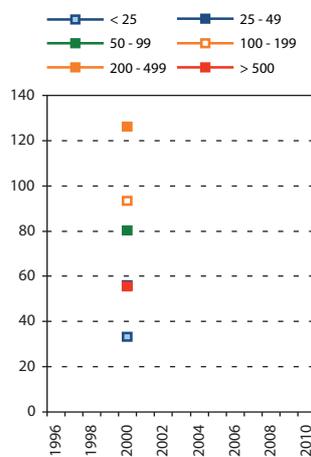
% of dairy farms and cows in size classes (2000)



* size class where IFCN typical farms are

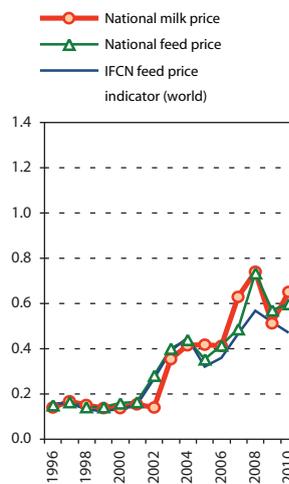
Farm structure

cows per herd size (in 1,000's)



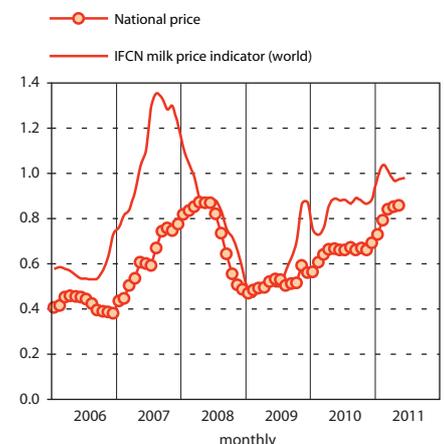
Milk and feed price

1,000 UYU / 100 kg



Farm gate milk prices

1,000 UYU / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2008, milk production.

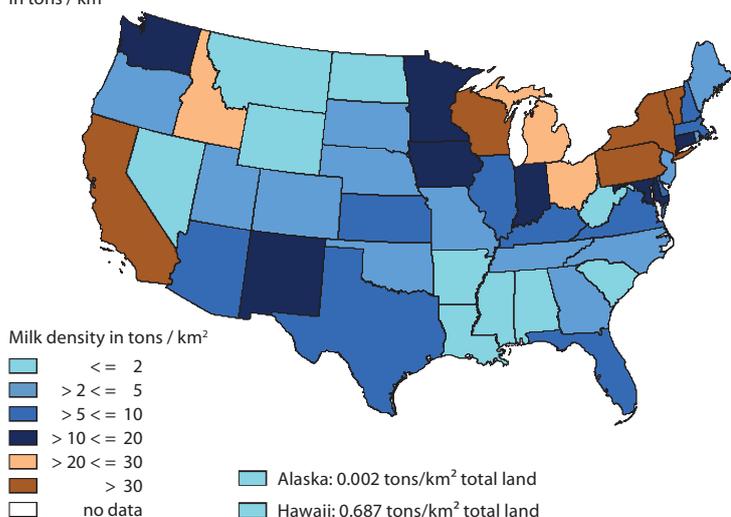


Ed Jesse



Milk density 2010

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 82.1 mill t ECM (number 2 in the world)
- No. of dairy farms: 62,500
- Share of milk produced in farms with more than 50 cows: 94%
- Milk price: -7% to world market
- Feed price: -7% to world market

Key developments 2006-2010

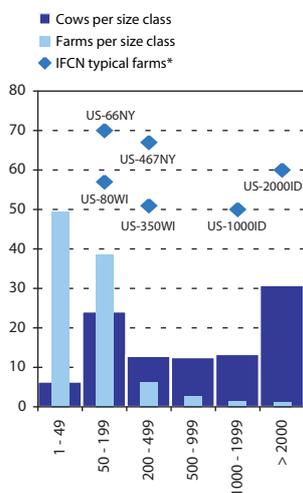
- Milk production growth: +1.4% per year
- Share of time milk price was above world market level: 60%
- Milk price was on average 5% above the world market
- Share of time feed price was above world market level: 0%
- Share of time milk : feed price ratio was above 1.5 (favourable): 80%

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	65.82	66.90	71.51	72.71	72.95	77.80	81.18	82.09	1.6%	1.4%
Cows (in 1,000's)	9,372	9,151	9,199	9,139	9,012	9,112	9,315	9,113	-0.2%	0.0%
Milk yield (t/cow/year)	7.0	7.3	7.8	8.0	8.1	8.5	8.7	9.0	1.8%	1.3%
Farm structure										
No. of dairy farms (in 1,000's)	131	117	105	91	82	75	67	63	-5.1%	-4.4%
Average farm size (cows/farm)	72	78	88	100	111	122	139	146	5.2%	4.6%
Prices in national currency										
Milk : feed price ratio	2.4	3.3	2.8	2.4	2.8	2.1	1.9	1.8	-2.2%	-4.3%
Cull cow (USD / kg live weight)	0.63	0.75	0.84	0.82	1.11	1.03	1.12	1.21	4.8%	4.1%
Land - buy (USD / ha)	2,964	3,310	3,606	3,927	4,372	5,681	6,817	6,669	6.0%	4.1%

Farm structure

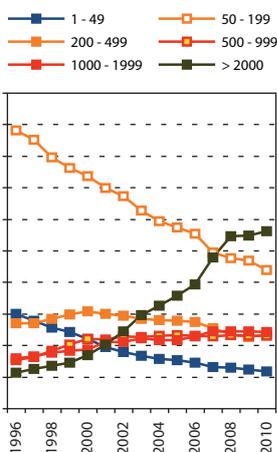
% of dairy farms and cows in size classes (2010)



* size class where IFCN typical farms are

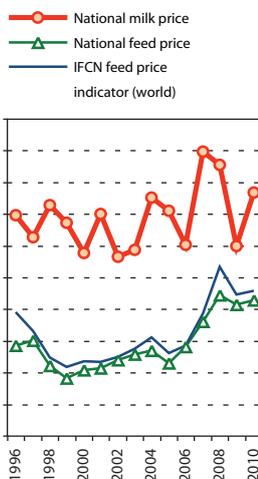
Farm structure

cows per herd size (in 1,000's)



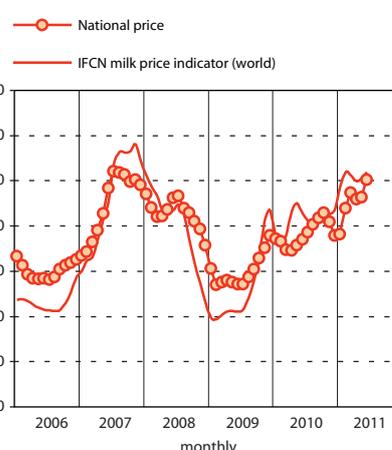
Milk and feed price

USD / 100 kg



Farm gate milk prices

USD / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.





STATUS AND KEY DEVELOPMENTS

Status 2010

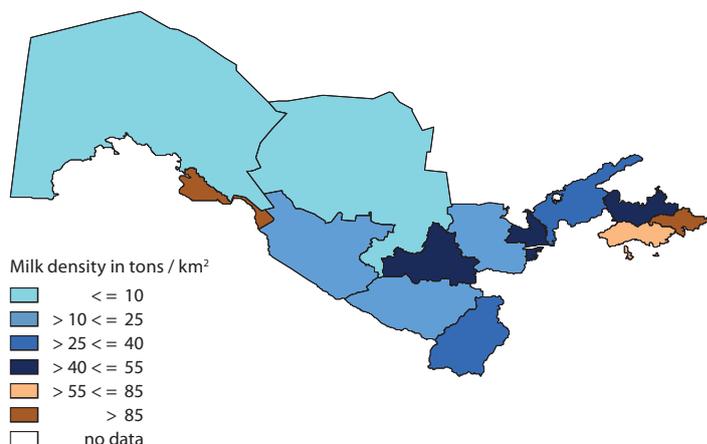
- Milk production (cow's): 5.7 mill t ECM (number 27 in the world)
- No. of dairy farms: 1,757,246
- Share of milk produced in private farms: 5%
- Milk price: 41% to world market
- Feed price: 0% to world market

Key developments 2006-2010

- Milk production growth: +6.2% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 22% above the world market
- Share of time feed price was above world market level: 0%
- Share of time milk : feed price ratio was above 1.5 (favourable): 80%

Milk density 2010

in tons / km²

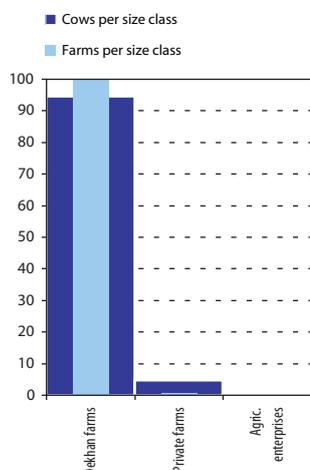


Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	3.08	3.22	3.31	3.38	3.98	4.52	5.05	5.74	4.5%	6.2%
Cows (in 1,000's)	2,234	2,310	2,362	2,557	2,700	2,983	3,327	3,764	3.8%	6.0%
Milk yield (t/cow/year)	1.4	1.4	1.4	1.3	1.5	1.5	1.5	1.5	0.7%	0.2%
Farm structure										
No. of dairy farms (in 1,000's)	942	1,014	1,057	1,102	1,288	1,414	1,573	1,757	4.6%	5.6%
Average farm size (cows/farm)	2.4	2.3	2.2	2.3	2.1	2.1	2.1	2.1	-0.7%	0.4%
Prices in national currency										
Milk : feed price ratio		4.7	2.6	1.0	1.2	1.9	1.8	2.5		8.2%
Cull cow (UZS / kg live weight)								6,100		
Land - buy (1,000 UZS / ha)										

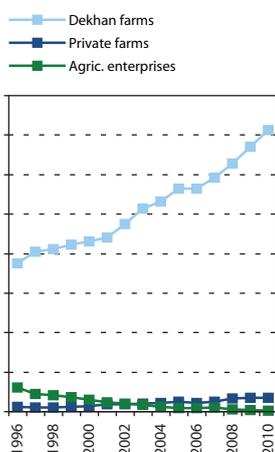
Farm structure

% of dairy farms and cows in size classes (2010)



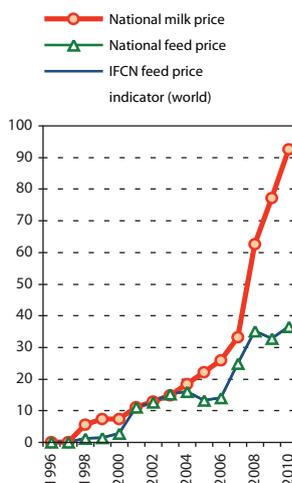
Farm structure

cows per herd size (in 1,000's)



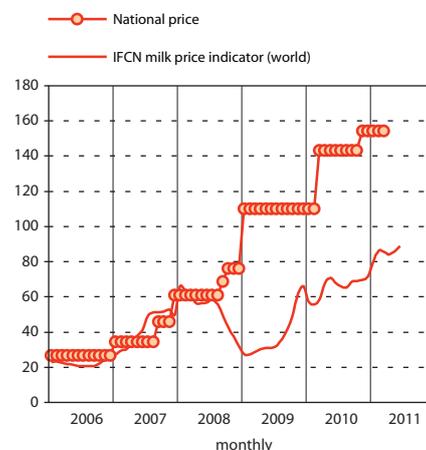
Milk and feed price

1,000 UZS / 100 kg



Farm gate milk prices

1,000 UZS / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

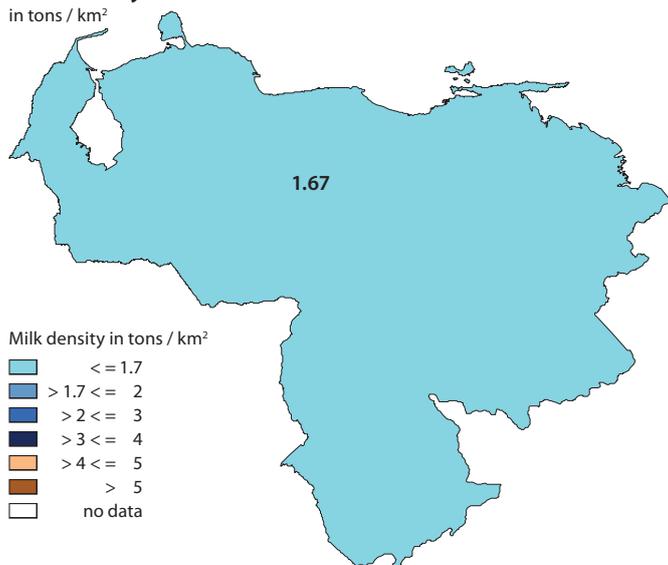
Milk map details: Data based on the year 2010, milk production.

Estimates done for: Dairy farm number 2009-2010. Farm structure data (% dairy on total livestock production). No. of cows per size class: Based on average farm size per class: 2; 50; 100.

Remarks: Since no statistical information on soybean meal and corn prices are available the world market prices are used. Dekhan farms: Family enterprises involved in agriculture, producing on land given on grounds of lifelong hereditary possession after Soviet Rule.

Milk density 2010

in tons / km²



STATUS AND KEY DEVELOPMENTS

Status 2010

- Milk production (cow's): 1.6 mill t ECM (number 59 in the world)
- Milk price: -9% to world market
- Feed price: 0% to world market

Key developments 2006-2010

- Milk production growth: +4.7% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 33% above the world market
- Share of time feed price was above world market level: 0%
- Share of time milk : feed price ratio was above 1.5 (favourable): 100%

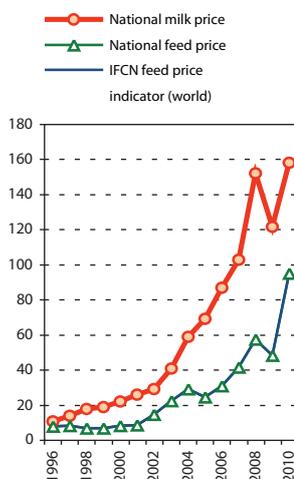
Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates	
									1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	1.31	1.31	1.31	1.30	1.28	1.33	1.47	1.60	1.4%	4.7%
Cows (in 1,000's)	740	740	735	730	730	747	811	864	1.1%	3.7%
Milk yield (t/cow/year)	1.8	1.8	1.8	1.8	1.7	1.8	1.8	1.8	0.3%	1.0%
Farm structure										
No. of dairy farms (in 1,000's)	123	123	123	122	122	125	135	144	1.1%	3.7%
Average farm size (cows/farm)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	0.0%	0.0%
Prices in national currency										
Milk : feed price ratio	1.3	2.6	2.7	2.0	2.0	2.8	2.6	1.7	1.6%	-12.3%
Cull cow (VEF / kg live weight)										
Land - buy (VEF / ha)										



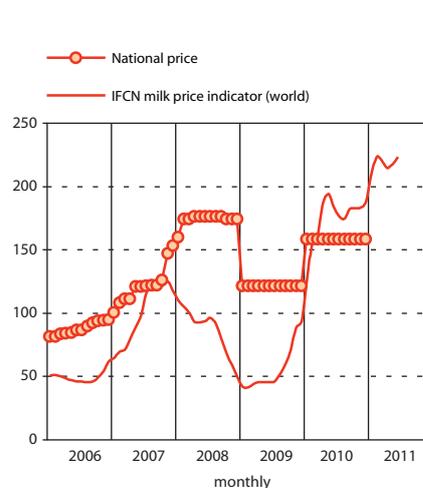
Milk and feed price

VEF / 100 kg



Farm gate milk prices

VEF / 100 kg milk (ECM)



Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Monthly milk prices 2009-2010: annual averages. Estimated dairy farm number via assumption farm size equals Peru.

Remarks: Since no statistical information on soybean meal and corn prices are available the world market price is used.



STATUS AND KEY DEVELOPMENTS

Status 2010

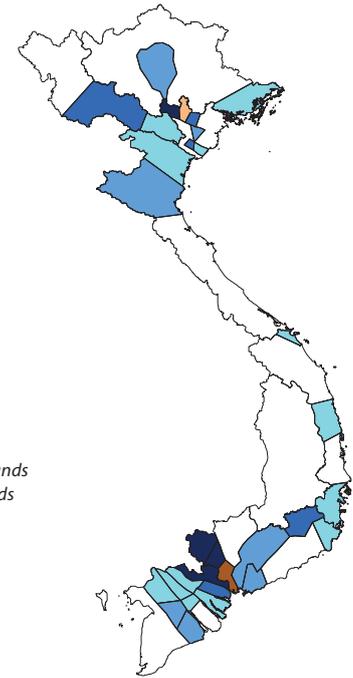
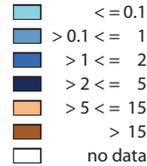
- Milk production (cow's): 0.3 mill t ECM (number 105 in the world)
- No. of dairy farms: 20,271
- Share of milk produced in farms with more than 10 cows: 17% (2001)
- Milk price: 11% to world market
- Feed price: 71% to world market

Key developments 2006-2010

- Milk production growth: +8.5% per year
- Share of time milk price was above world market level: 80%
- Milk price was on average 15% above the world market
- Share of time feed price was above world market level: 100%
- Share of time milk : feed price ratio was above 1.5 (favourable): 40%

Milk density 2010 in tons / km²

Milk density in tons / km²



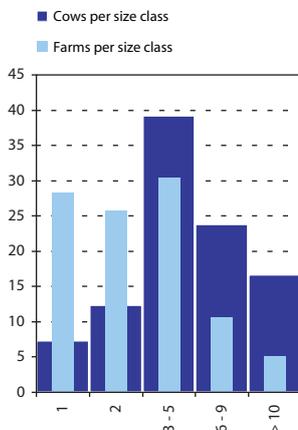
Remarks: The absence of Spratly Islands (Truong Sa islands) and Paracel Islands (Hoang Sa islands) due to none-milk production in these areas.

Key variables

	1996	1998	2000	2002	2004	2006	2008	2010	Annual growth rates 1996-2010	2006-10
Milk production in ECM (cow's)										
Production (mill t)	0.04	0.03	0.05	0.08	0.15	0.21	0.26	0.30	15.0%	8.5%
Cows (in 1,000's)	53	41	68	56	96	113	108	129	6.5%	3.2%
Milk yield (t/cow/year)	0.8	0.8	0.8	1.4	1.6	1.9	2.4	2.3	7.9%	5.1%
Farm structure										
No. of dairy farms (in 1,000's)				15	18	20	20	20		0.8%
Average farm size (cows/farm)				4	5	6	5	6		2.4%
Prices in national currency										
Milk : feed price ratio	1.6	1.8	1.7	1.6	1.4	2.0	1.4	1.2	-2.3%	-12.8%
Cull cow (VND / kg live weight)							25,000	26,000		
Land - buy (1,000 VND / ha)										

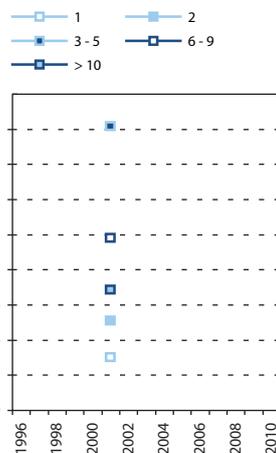
Farm structure

% of dairy farms and cows in size classes (2001)



Farm structure

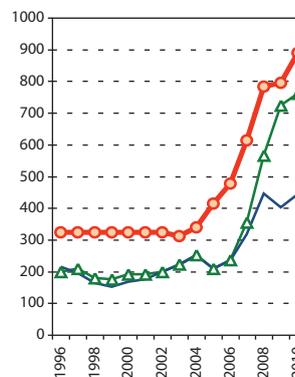
cows per herd size (in 1,000's)



Milk and feed price

1,000 VND / 100 kg

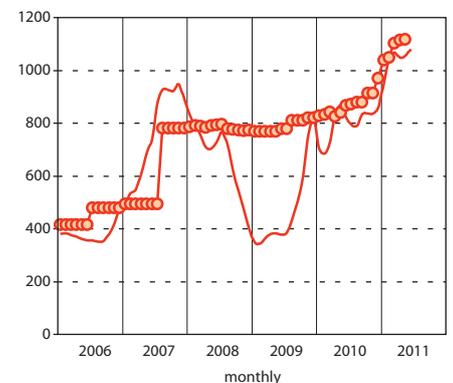
—○— National milk price
—△— National feed price
—□— IFCN feed price indicator (world)



Farm gate milk prices

1,000 VND / 100 kg milk (ECM)

—○— National price
—□— IFCN milk price indicator (world)



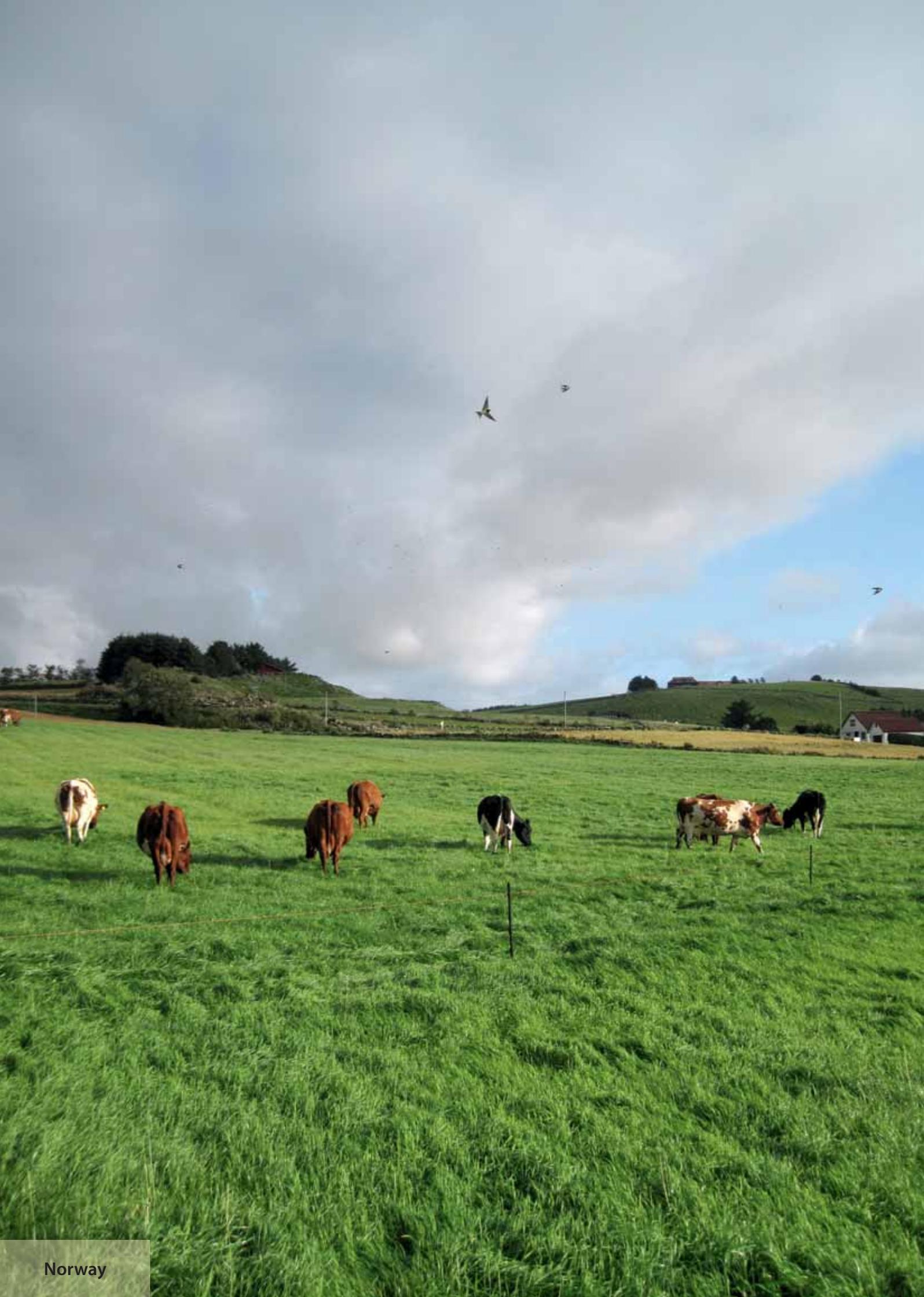
Explanations

Sources: National statistics, FAO, AMI, IMF. 2011 data: preliminary and partly estimated.

Milk map details: Data based on the year 2010, milk production.

Estimates done for: Dairy farm number 2009-2010.

Remarks: Soybean meal and corn price 1996-2006 are linked to the world market prices.







Algeria



Algeria – pictures by Abderrazak Djellali

Chapter 4

Special studies

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4.1 Methodological approach to analyse sustainability in dairy farms



Asaah Ndambi, Johann Steglich
and Torsten Hemme

Introduction

This study shows the current research status of the IFCN in the field of sustainability which is so far still under development.

It is envisaged that the final method that will be developed would generate outcome which could guide farmers, dairy investors, policy makers and other stakeholders in selecting farm strategies and deciding on the allocation of resources to the dairy sector.

Method

This approach for measuring sustainability involves three major steps. The first step is the selection of the areas of sustainability to be measured. Once the right areas are selected, appropriate measurable indicators need to be chosen to represent these areas. Finally, it is necessary to set the borders so that it is possible to distinguish clearly between sustainable farms and unsustainable ones. An open point in the method development is how to select suitable indicators and set their bounds. Moreover it is an open point if we need one set of indicators/bounds or if these will differ by region. In this analysis, the concept using one set of indicators and bounds has been defined and will be applied for farms in 4 different countries.

Selection of areas (to represent) and indicators (to measure)

Three categories of sustainability are covered in this study; economic, environmental and social sustainability. Three areas were selected to represent each of the categories, giving a total of 9 areas as shown in the table on the next page. For each of the 9 areas, one indicator was chosen for sustainability measurement based on the availability and consistence of the data. The entrepreneur's profit was used to measure the economic performance of the farm since it considers all costs and returns. The operating profit margin was used to measure risk as it indicates the level of unexpected variability in farm returns. The proportion of the return to labour on the average wage level on the farm was used to show competitiveness on the labour market. The carbon footprint based on a life cycle assessment approach (Hagemann et al, 2011)¹ was used to quantify dairy emissions. Water footprint was used to show resource use in various farms. The stocking rate was used to quantify production intensity. The proportion of government payments on farm income was used to show the level of influence of dairy policies on the farm. The working condition was represented using the number of hours per worker and year. Finally, job creation by the dairy farms was measured by the number of employees required to produce 100 tons of milk.

IFCN sustainability scale

The IFCN has developed a scaling system which ranks farms on sustainability using 11 grades consisting of whole numbers from +5 through 0 to -5 as shown on the chart. These grades were clustered into three groups:

a) Farms having a grade of +1 to +5 are sustainable and are further divided into farms of **tolerable influence** and farms of **unavoidable influence** (which indicates the best situation, where the impact of the indicator on sustainability can no longer be improved).

b) Farms with a grade of 0 (zero) have an average value which falls in the **tolerance bound**, the border area between sustainable and unsustainable farms.

c) Farms which have a grade between -1 and -5 are described as unsustainable and are subdivided into farms of **avoidable influence** (where the impact of the indicator on sustainability can be avoided by improved farm practices) and farms at **high risk** (with the worst situation of sustainability). The bounds for each indicator have been predefined by the IFCN based on available literature and calculations using data from the IFCN farm database 2011 (data 2010).

Since sustainability priorities and the tolerance levels for different indicators might differ in various regions, this study simply describes an approach which can be adapted to improve its suitability depending on the conditions where it is applied.

The sustainability profile

This chart shows the sustainability of one farm, based on the 9 indicators described above. It has all 11 grades (from -5 to +5) arranged in concentric circles, with the lowest grade (-5) closest to the centre, and the highest grade (+5) furthest from the centre. The broken red line shows the tolerance bound which distinguishes whether a farm is sustainable (if its grade falls outside the red shade) or unsustainable. The blue shaded area shows the grades for the selected farm. The IFCN approach gives the possibility to show sustainability based on data for a selected year or to use average values for 2008-2010, as was the case in this study. Based on the method at this stage, the farm from Germany (DE-650) is sustainable in terms of resource use, while it lies at the tolerance bound for working conditions, and is unsustainable for the other 7 areas.

Sustainability benchmark

In order to have a chance to compare farms based on sustainability, a sustainability benchmark is necessary. This benchmark shows for each farm an average grade of indicators for all three areas in each of the categories; economic, environmental and social sustainability. Six farms (two from Jordan, two from Germany, and one each from Bangladesh and Cameroon) were used for this comparison. Based on the a standard definition of indicators and bounds the farms from Jordan, Bangladesh and Cameroon were more sustainable than German farms in economic and social terms while the German farms were more sustainable in environmental terms, compared to all other farms.

Method conclusion

So far the IFCN approach was able to benchmark dairy farm economics by using a globally standardised methodology. This analysis shows that it is possible to define for one farm type a sustainability profile. Moreover it indicates that a benchmarking if sustainability can be possible.

This study identifies the key method challenge which lies in the specification of appropriate indicators and bounds for them. So the first question is – what are the best fitting indicators and bounds? The second question is - in which areas can a global “standard” approach be applied and in which cases we need to apply locally specific indicators & bounds? The authors of this study will welcome all comments and ideas to better analyse sustainability of dairy farming.

Explanations:

Farm codes: Example DE-95N = German 95-cow farm in Northern Germany (details see Annex 5). **Labour Units:** 1 labour unit = 2100 hrs. **Livestock Units:** 1 Livestock Unit = 650 kg.

ECM = Energy Corrected Milk (4% fat, 3.3% protein)

¹Hagemann M, Ndambi A, Hemme T, Latacz-Lohmann U 2011: Contribution of milk production to global greenhouse gas emissions: An estimation based on typical farms.

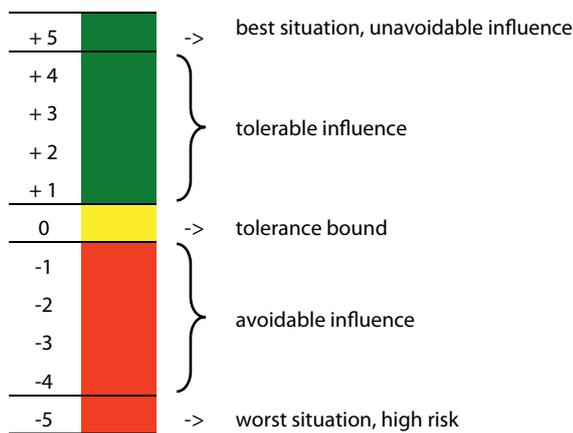
Environ Sci Pollut Res Int.

4.1 Sustainability in dairy farms worldwide Sustainability areas and indicators

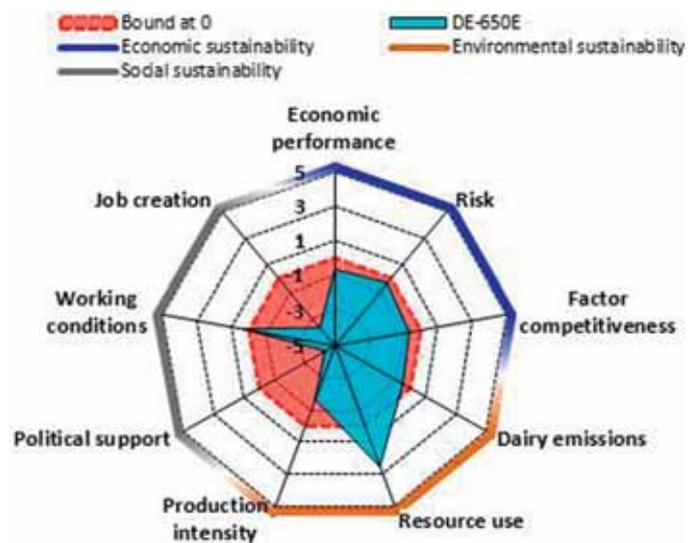
Area	Indicator	unit	IFCN sustainability scale numbers		
			+5 to +1	0	-1 to -5
Economic performance	Entrepreneur's profit	US-\$/100 kg milk ECM	good > 1	average -1 to 1	bad < -1
Risk	Operating profit margin	%	> 15%	12% to 15%	< 12%
Factor competitiveness	Return to labour on average wage level	%	> 110%	90% to 110%	< 90%
Dairy emissions	Carbon footprint	g CO2 equ./100 kg milk ECM	0 to 130	130 to 140	> 140
Resource use	Water footprint	l water/kg milk ECM	0 to 1800	1800 to 2000	> 2000
Production intensity	Stocking rate	Livestock units/ha	< 1	1 to 1.2	> 1.2
Political support	Government payments on farm income	%	0 to 25%	25% to 30%	> 30% & < 0%
Working conditions	Hours per worker and year	h/year	< 2000	2000 to 2200	> 2200
Job creation	Employees per 100 t of milk	Labour units/100 t milk	> 1.1	0.9 to 1.1	< 0.9

IFCN sustainability scale and profile

Scaling system of indicators

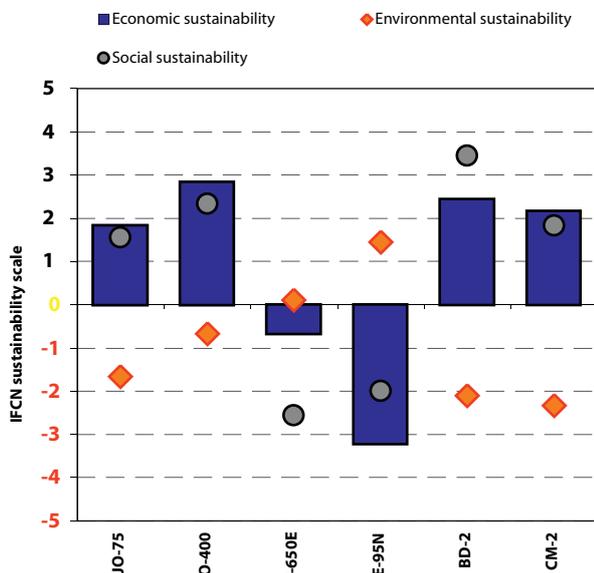


Sustainability profile for DE-650E

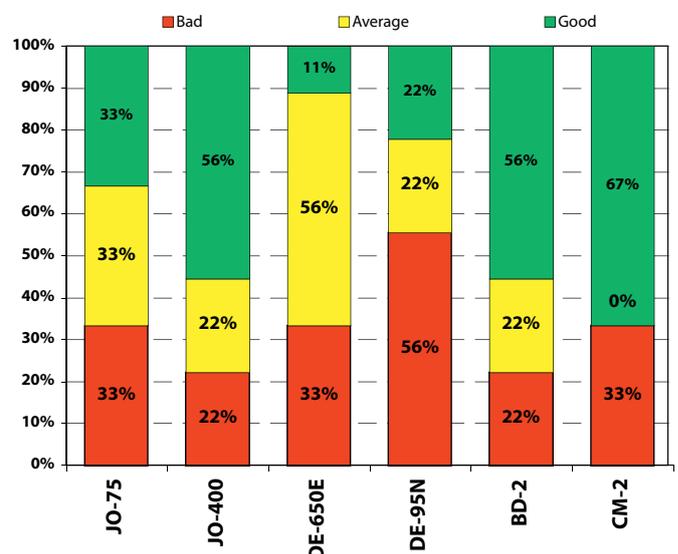


Sustainability comparison

Sustainability benchmark



Sustainability overview



4.2 Feeding systems: an assessment of dairy competitiveness



Othman Alqaisi, Johann Steglich,
Asaah Ndambi and Torsten Hemme

Introduction

The recent boom in global grain prices has raised questions regarding profitability on dairy farms. Feed cost represents more than 50% of the total cost associated with the production of milk. On the other hand, the feed cost share of the total costs of milk production varies depending on the feeding system (i.e. grazing vs concentrate based feeding system). Therefore, one of the major goals for every dairy farmer is to reduce feed cost via a better management of feed resources on dairy farms. For this reason it is important to be familiar with the feeding systems in different countries world-wide in order to understand the variations between systems and to assess their individual competitiveness. In addition this will help to reduce additional costs associated with feed; as well as improve the environment on dairy farms.

Data and method background

Typical farm data from the year 2009 were used for this analysis. There were two components of importance included in the data: the typical dairy ration, and the economic farm data. The typical dairy ration is an average weighted ration that is fed to a lactating dairy cow. Feeding systems were defined based on the typical ration which was composed of concentrate (grains fed in mixture form or alone), corn silage, grass silage, grass, by-products from plant and animal sources, hay, straw and feed additives.

Feed efficiency (FE) is calculated as daily energy corrected milk (ECM) yield in kg over the daily dry matter intake in kg. In this study a comparison was made between feeding systems on typical dairy farms in Germany (DE), USA (US), Jordan (JO), New Zealand (NZ) and Bangladesh (BD) to analyse feed prices, feed cost and FE.

Results

Feeding systems

There were different feeding systems in the farms which were studied. The US farms usually use a high share of concentrate and corn silage feed in the diet. The DE farm has higher corn silage and grass silage feed with a lower input of concentrates. In the JO farm, the feedlot feeding system is dominant, and there is no land allocated for cropping or grass production. The ration is based on concentrate and hay with an average of 12 kg concentrate dry matter intake

per day. The NZ dairy farms mainly use a grazing system, together with a small amount of grass silage input. The feeding system in the BD farm was based basically on low quality agricultural by products such as rice straw and less than one kg concentrate per day in addition to grass from pasture.

Feed efficiency

The daily ECM milk yield varied from farm to farm, with the highest daily milk yield of 33.5 kg ECM found in the US farm and the lowest milk yield of 2.8 kg ECM per day in the BD farm. The NZ farm had a moderate milk yield of 15.1 kg ECM per day, compared to a higher milk production of 22.5 kg ECM per day in the DE farm.

FE was the highest at 1.36 kg ECM/kg DM intake in the US farm compared to 0.37 kg ECM/kg DM intake in the BD farm and a moderate FE of 1.20 kg ECM/kg DM intake in the JO farm.

Feed cost

Feed cost also varied from system to system. The highest was in the JO farm at 45 US-\$ /100 kg ECM which was driven by higher concentrate and hay prices compared to only 17 US-\$ /100 kg in the US farm. In the by-product feeding system dominant in the BD farm, feed cost was 24 US-\$ /100 kg. When comparing the on-farm concentrate prices, the DE farm had a 15% lower feed price compared to the US farm, while the DE and the JO farms had similar concentrate prices with DE showing a 4% lower concentrate price than the JO farm. On-farm dry matter feed price (DMFP) was 31% lower in the DE farm compared to the JO farm, but the price was much higher (54%) than the NZ farm. Land cost on feed cost was the highest in the NZ farm with 29% of the land cost attributed to feed compared to 16% in the DE farm. However, all milk on the NZ farm was produced from home grown forage compared to only 28% of milk produced from home grown forage in the DE farm.

Conclusion

Feeding systems which are based on imported grains have a higher feed cost compared to home grown feeding systems, and are most affected by changes in global feed prices and appear to be less competitive compared to other systems. Feed cost was lower in the grazing system dominant in the NZ farm as home grown feed was used for most of the milk production. In this system the feed cost is low but so also is the feed efficiency. From this study it may be concluded that feeding systems based on grazing and by-products, produce less milk associated with lower feed efficiency, but at a lower cost compared to the high input-output systems in the EU where feed cost is high.

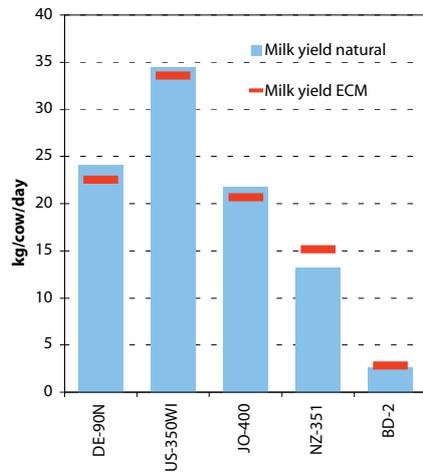
Explanations:

Data sources: Data from year 2009. **Dry matter feed intake:** Data from typical farm ration, data on daily intake basis, and dry matter intake. **Feed efficiency:** Daily energy corrected milk (ECM) yield in kg over the daily dry matter intake in kg. **Energy corrected feed price (EPC):** Calculated as the following: 1.) The energy and protein difference between typical and EPC concentrate standard was calculated. 2.) In order to find the EPC conversion factor, the energy and protein proportional differences to the EPC standard were calculated and divided by 2. 3.) The price of EPC/ ton concentrate is: (EPC conversion factor * typical concentrate price).

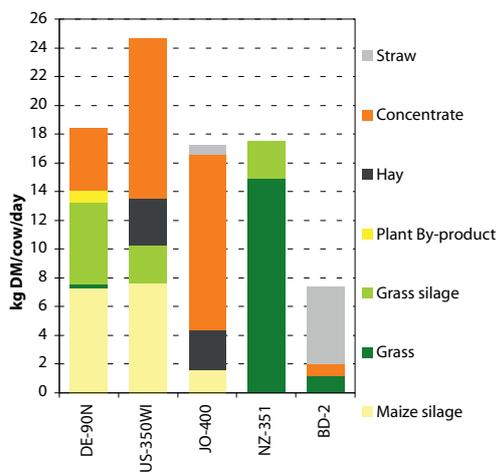
Predicted EPC concentrate intake per kg milk: The daily amount of EPC concentrate in kg (as feed) divided by the daily milk produced per day in ECM. **Milk production from forage and concentrate per ha:** Milk from protein and energy in roughage and concentrate considering the net energy for lactation and energy for maintenance, the total quantity of milk is divided by land allocated for dairy. **Milk production from forage and concentrate per cow:** Milk from protein and energy in roughage and concentrate considering the net energy for lactation and energy for maintenance, the total milk produced from forage and concentrate separately divided by the number of lactating cows on farm. **On-farm dry matter feed price (DMFP):** is a function of total feed cost per 100 kg ECM (excluding the feeding and manure handling cost) multiplied by the FE on that farm.

Description of feeding system

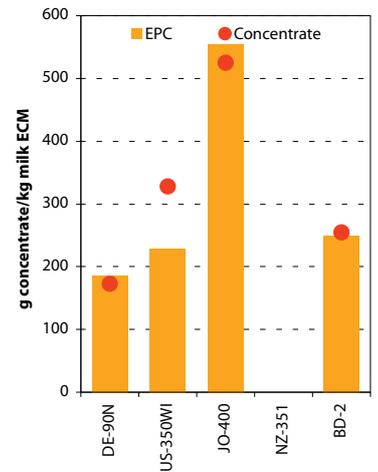
Milk yield



Feed ration

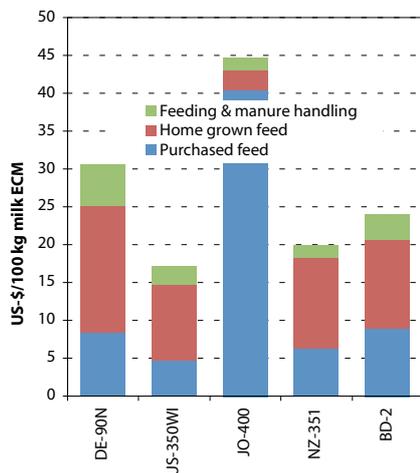


Concentrate feed intensity

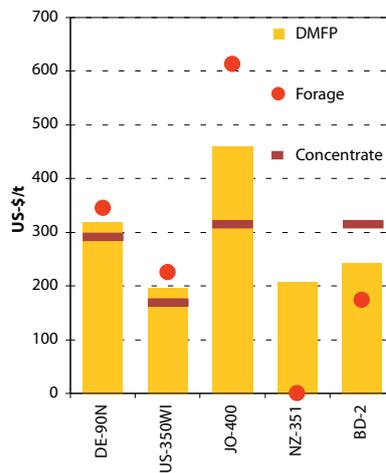


Feed cost and its drivers

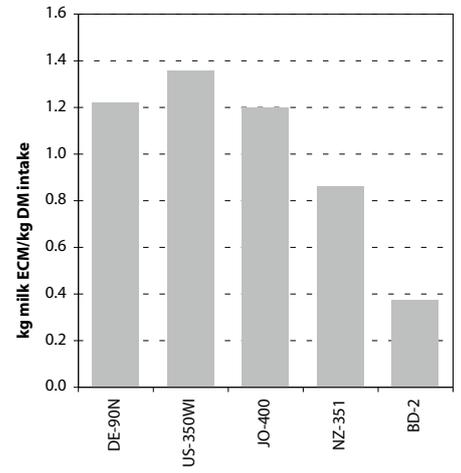
Feed cost



Feed prices

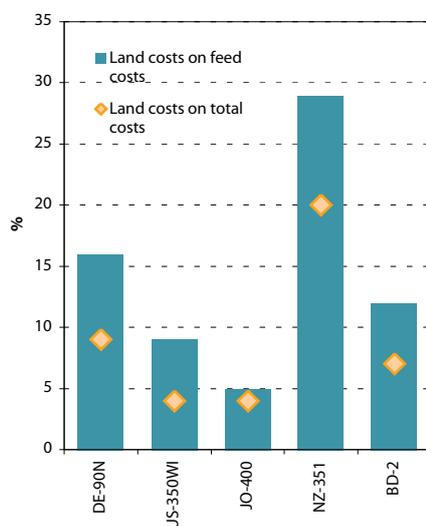


Total feed efficiency

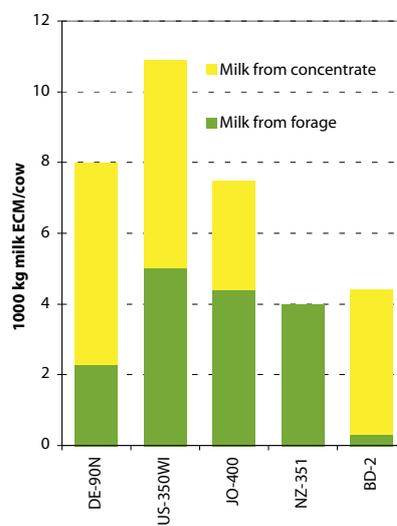


Land cost and productivity

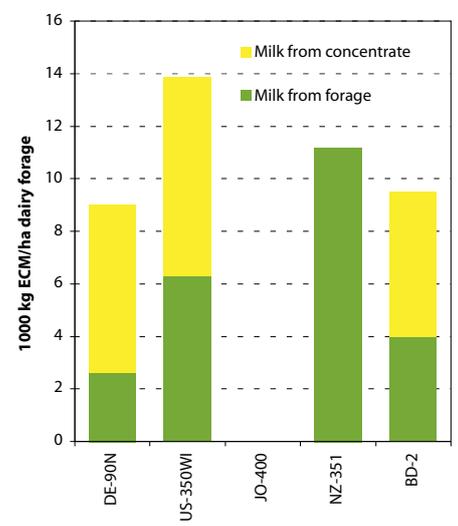
Land cost



Cow productivity



Land productivity



4.3 Feed intake and nutrient use efficiency in dairy farming systems



Othman Alqaisi, Johann Steglich
and Torsten Hemme

Introduction

Following the previous feed study, the current study is an in-depth analysis of the typical feed ration for lactating cows. This is essential in order to understand the variations in feed efficiency (FE) and its drivers. Moreover, a better formulated ration is the key factor for maximizing dairy profitability and reducing the environmental impact of dairy farming (nitrogen and phosphorus emissions).

In terms of feed quality, the feed energy offered to the cow is used as an indicator of milk energy output and the energy use efficiency-balance. Therefore, it would be important to further investigate the nutrient use efficiency of the ration that is fed to the cows. The objective of this study is to understand the variations in terms of nutrients and energy use efficiency, observed in different feeding systems in the five selected typical dairy farms from Germany, USA, Jordan, New Zealand and Bangladesh.

Data and method background

A typical dairy ration represents the average weighted ration on typical dairy farms. This information was inserted in the TYPICAL model, which now includes a recently developed FEED sub-module. This FEED module analyses feed cost, feed prices, nutrients and energy use efficiency, and land productivity, in addition to other important issues related to feeding systems on dairy farms.

The module was designed to include the feedstuff composition of up to 500 feedstuffs that are commonly used on dairy farms. Detailed information of the composition of each foodstuff is given. The type of feed of the typical ration was provided by research partners and then it was coded to simulate the intake of feed ingredients on DM basis. The results are shown per kg DM intake and per kg ECM milk produced.

Results

Estimated intake of feed ingredients in each selected farm is shown in table 1. The results present a great variation in the ingredients ingested, depending on the feeding system of each farm. The most essential ingredients mentioned here are the crude protein (CP) intake: The DE farm had the highest percentage (15 %) and the BD farm the lowest (only 6 %). The other important ingredient is the Net Energy for Lactation content (NEL). The highest level was observed in a concentrate based diet in the US farm and the lowest in the BD farm. An average content of these two ingredients was found in the NZ farm.

Table 1: Estimated intake of feed ingredients in selected typical farms

Ingredient	Unit	DE-90N	US-350WI	JO-400	NZ-351	BD-2
Crude Protein (CP)	% of DM	15	14	14	10	6
Total Digestible Nutrients (TDN)	kg/day	13.2	18.8	13.5	10.2	3.4
Net Energy for Lactation (NEL)	MJ/kg DM	6.0	6.4	5.2	4.8	3.7
Acid Detergent Fiber (ADF)	g/kg DM	260	190	140	380	480
Neutral Detergent Fiber (NDF)	g/kg DM	420	310	240	640	660
Phosphorus (P)	% of DM	0.35%	0.31%	0.32%	0.29%	0.20%

Energy intake NEL per kg ECM milk produced shows that the BD farm had twice as much intake as the US farm. On the other hand the CP intake was also higher in the BD farm (161 g/kg ECM milk produced) compared to 104 g/kg ECM milk produced in the US farm. Nitrogen and phosphorus use efficiency varied, with the highest efficiency observed in the US farm (32% and 44% respectively) compared to a low efficiency of 20% and 18% respectively in the BD farm. In terms of energy use efficiency, the US and DE farms seemed to have a similar level of efficiency of 70% while the efficiency was very low in the BD farm with only 31% from the NEL intake secreted in milk. The extra NEL intake was calculated from the difference between NEL intake and maintenance and the energy in milk which is used to increase the daily body energy reserves. The results show that the extra energy intake for body cow maintenance could be used to produce additional milk of 1 and 6 kg in the BD and the US farms respectively, indicating that there is an opportunity to utilize the energy intake for milk production. With extra energy used for body reserves, a higher feed cost is expected. However; a better formulated ration which fulfils the animal's requirements could eliminate this cost.

Conclusion

This in-depth study in dairy farms shows the variations in nutrient use efficiency in different feeding systems and their consequences. There were variations in the nutrient use efficiency in a feeding system with low quality by-products compared to the ryegrass grazing system in NZ. Although there did not appear to be a great difference in terms of efficiency, the NZ grazing system produced more milk as the breed and DM intake were different. Regarding the nutrient use efficiency, the US feeding system was the most efficient compared to other systems in this study. It also had the highest milk production (animals). Improving feed efficiency, using management and nutrition tools (diet formulation which fulfils the animal's requirements), will remain the basis to reduce extra energy and nutrient intake which can thus be devoted to milk production.

Explanations:

Abbreviations: DM: dry matter. CP: crude protein. TDN: total digestible nutrients. CF: crude fibre. EE: ether extract. ADF: Acid detergent fibre NDF: Neutral detergent fibre. eNDF: effective NDF. NEL: net energy for lactation. P: phosphorus. N: Nitrogen. NUE: nitrogen use efficiency. PUE: phosphorus use efficiency.

Data sources: Data from year 2009. **Dry matter feed intake:** Data from typical farm ration, data on daily intake basis (as feed basis, and dry matter intake).

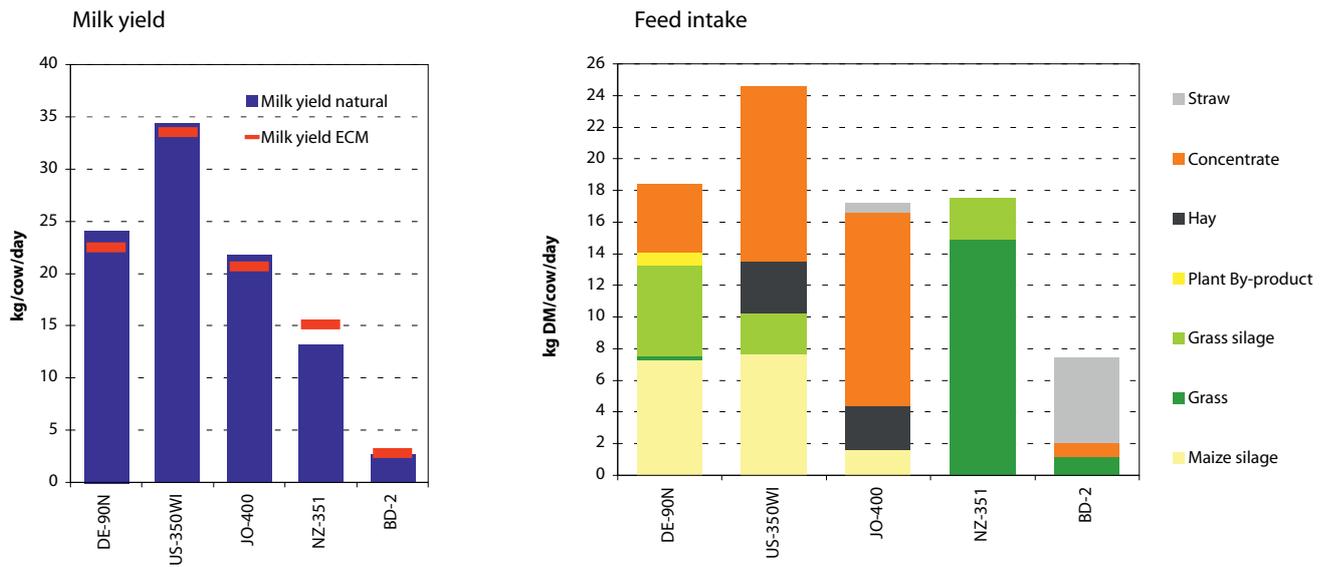
Calculations: CP % in the diet = the amount of CP in the whole diet in kg divided by the total amount of DM intake. NEL MJ per kg DM = the total amount of NEL in MJ in the whole diet divided by the total amount of DM intake. NDF and ADF and P content in the diet = the total intake amount of those two ingredients in g divided by the total DM intake.

Nitrogen in feed = the amount of CP in each single feedstuff divided by 6.25. **Nitrogen in milk** = CP content divided by 6.38. **NUE** = nitrogen in milk divided by nitrogen content in feed. **P in milk:** assuming that in each kg of milk there is 1 g of P **PUE** = P in milk divided by P content in feed intake.

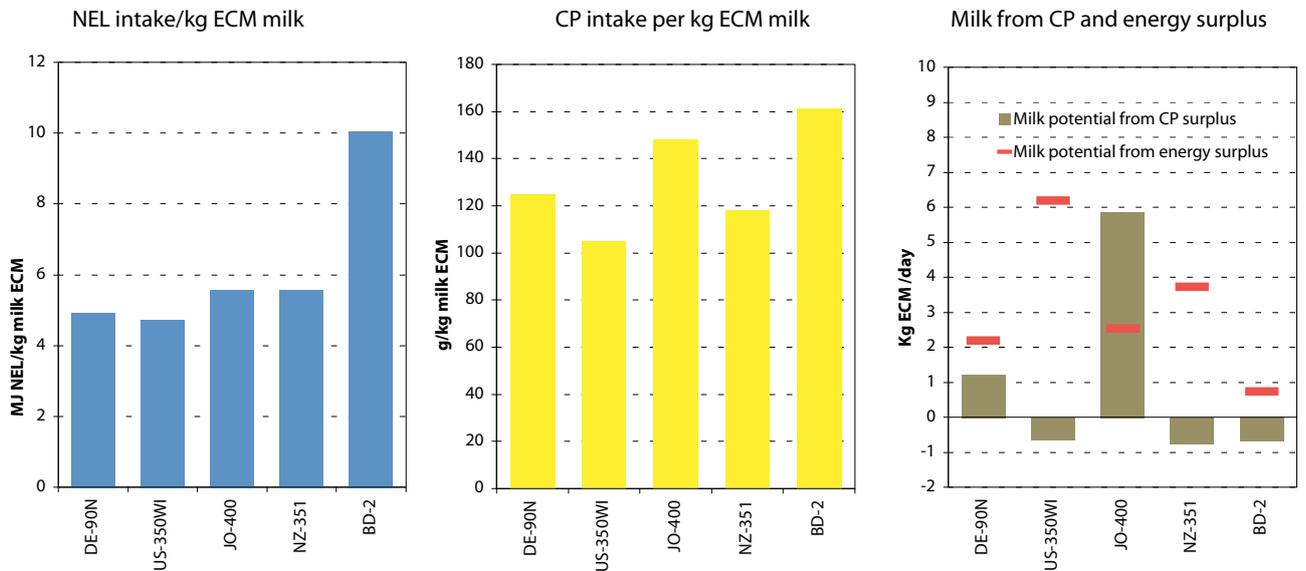
Milk energy in MJ/kg = $0.95 + 0.38 * \text{fat} \% + 0.21 * \text{protein} \% + 0.039 * 4.85$. NEL balance = NEL intake minus NEL for maintenance minus milk energy.

CP surplus and deficit was compared to the CP that can be utilized in the duodenum which was calculated based on the GfE (2001) formula: $7.84 * \text{ME} + 0.43 * \text{CP}$

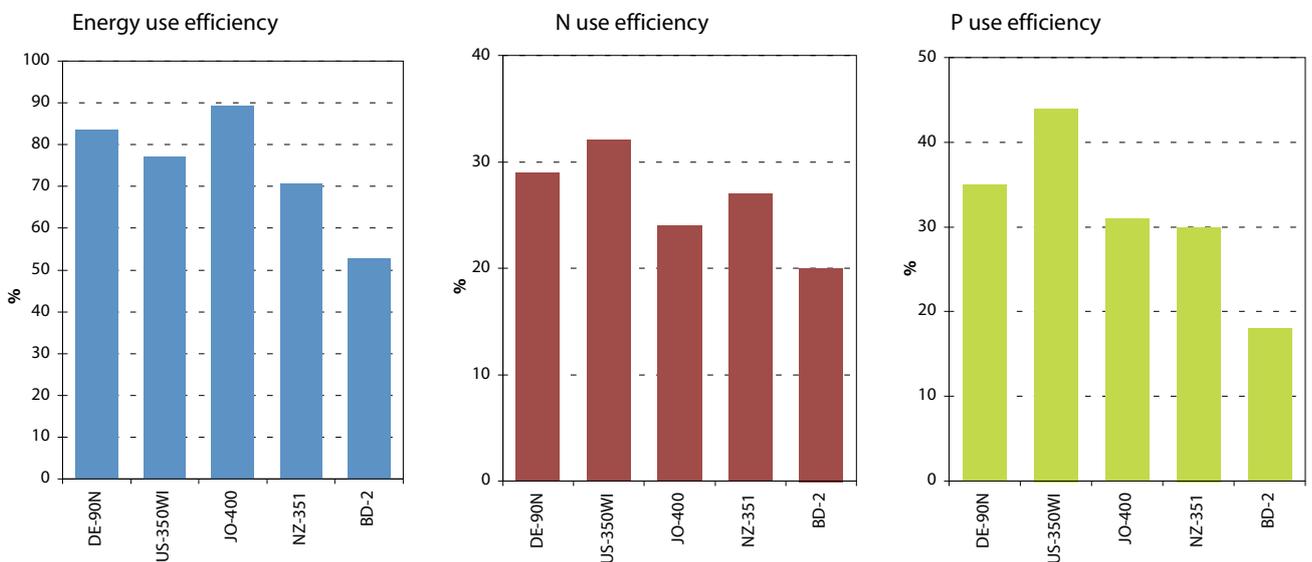
Milk yield and feed intake



Energy and crude protein concentration and intake



Nutrient use efficiency





Johann Steglich and Torsten Hemme

Introduction

The economic success and the viability of dairy farms all over the globe depend on the risks to which they are exposed. Besides production risk, political risk, technical risk, financial risk and personal risk, the market risk is challenging. The volatile input and output prices during the last five years have triggered a desire to know how stable dairy farms would be under varying market conditions. The IFCN developed a risk simulation module as an extension of the model TIPICAL 5.2.

Data and method background

The risk module of TIPICAL 5.2 has the ability to simulate different kinds of production and market risks by using a Monte Carlo simulation. It is possible to select between two different distribution curves for the risk variables: a standard normal distribution function and an isosceles triangular distribution function. A correlation between the milk price and the concentrate price can also be considered. For this special study the standard normal probability distribution function has been chosen for the milk price and concentrate price. The mean and standard deviation for these functions plus the correlation between both functions have been taken from the observed monthly data from January 2006 to December 2010 for selected countries. A 90-cow farm from the north of Germany (DE-90N), a 350-cow farm from Wisconsin USA (US-350WI), a 400-cow farm from Jordan (JO-400), a 351-cow farm from New Zealand (NZ-351) and a 2-cow farm from Bangladesh (BD-2) were chosen for this analysis. The assumptions are shown in the following table. In the New Zealand farm there is only a variation in the milk price because the cows do not get concentrate.

	Milk price		Feed price		Milk / Feed price correlation
	US-\$/100 kg milk ECM		US-\$/100 kg		
	Mean	Standard deviation	Mean	Standard deviation	
DE-90N	40.3	5.9	28.3	6.2	0.49
US-350WI	36.5	6.9	31.8	4.0	0.38
JO-400	46.1	14.1	35.0	8.4	0.26
NZ-351	26.9	4.3	-	-	-
BD-2	30.6	5.2	28.3	5.4	0.55

Explanations:

Data sources: Farm data from the year 2009, observed milk- and feed price on a monthly base from January 2006 to December 2010 from IFCN database.

TIPICAL: Technology impact and policy impact calculation model

Probability of success: The entrepreneur's profit is used to calculate the probability of success. Three categories are defined: good economic success = entrepreneur's profit is higher than 1 US-\$/100 kg milk ECM; moderate economic success = entrepreneur's profit is between -1 and 1 US-\$/100 kg milk ECM, bad economic success = entrepreneur's profit is lower than -1 US-\$/100 kg milk ECM.

Probability of survival: Operating receipts and operating expenses are used to calculate the probability of survival. Operating receipts = sum of dairy receipts, total direct payments, returns from dairy plant shares and other dairy related farm returns. Operating expenses = sum of total dairy related expenses, crop related expenses, general expenses, factor related expenses and dairy related family living expenses. Three categories are defined: good economic survival = operating receipts on operating expenses is higher than 105 %; moderate economic survival = operating receipts on operating expenses is between 95 % and 105 %; bad economic survival = operating receipts on operating expenses is lower than 95 %.

Results

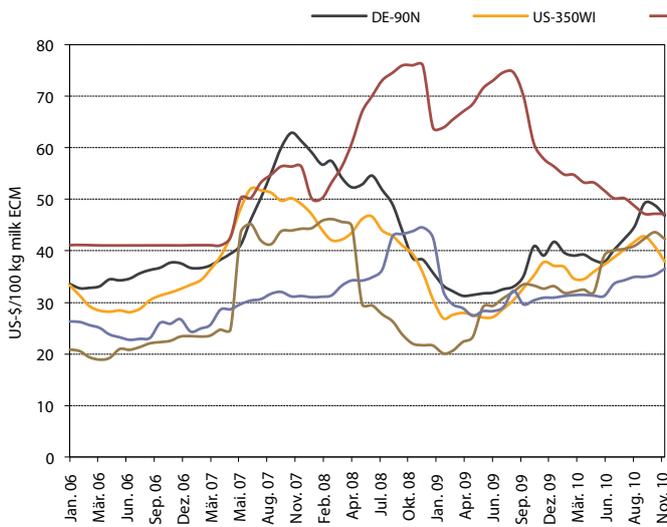
The probability function of cost of milk production only, depends on the intensity of concentrate used in the ration and the variation of the concentrate price. DE-90N, BD-2 and US-350WI show a variation in the cost of milk production of 15 US-\$/100 kg milk ECM, while for JO-400 it is 40 US-\$/100 kg milk ECM. NZ-351 is not influenced by varying concentrate prices because concentrates are not used. A meaningful indicator for the economic dairy farm performance is the return on investment (ROI). New Zealand shows a 89 % and Germany a 92 % probability of having a ROI between 0 % and 10 %. In contrast US-350WI and JO-400 cover a wider range of positive ROI. The ROI range with the highest probability is 0 % to 10 % for US-350WI (38 %) and 10 % to 20 % for JO-400 (14 %). The probability of success is calculated by the entrepreneurs' profit which includes the opportunity costs of the dairy enterprise. US-350WI, BD-2 and JO-400 have a high probability of success because the probability of an entrepreneur's profit higher than 1 US-\$/100 kg milk ECM is 79 %, 55 % and 51 % respectively. The probability that the entrepreneur's profit is smaller than -1 US-\$/100 kg milk ECM is significantly higher for DE-90N (85 %) and NZ-351 (80 %). Not only is the probability of success under varying market conditions important, but so also is the probability of survival. The probability of survival is measured as the ratio of operating receipts on operating expenses. The probability that DE-90N and US-350WI have operating receipts on operating expenses higher than 105 % is 89 % and 91 %. JO-400 and NZ-351 follow them with 55% and 66 %. In contrast, there is a low probability of BD-2 presenting a good economic survival, because the family living cost per 100 kg milk is extremely high.

Conclusion

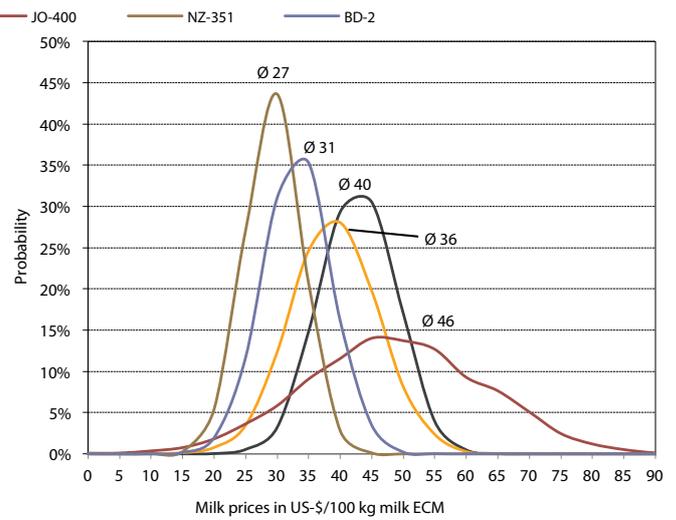
The analysis shows that market risk influences different dairy farms significantly. Volatile milk and concentrate markets have a strong impact on the success and the survival of a farm. Dairy farms with a lower profitability have a especially high risk to become unsuccessful by varying market prices. Wide variations and low correlations of the changing variables increase the probability of positive and negative results, because a wider range of combinations is possible. The reason is that there are more combinations of milk- and concentrate prices with a high difference. Opportunity costs even downgrade the probability of success whereas they improve the probability of survival, because they are no expenses. This study shows the importance of analyses and tools on risk. They should be improved and further developed for a detailed analysis on dairy farms.

4.4 Risk analysis for dairy farms under volatile market situations

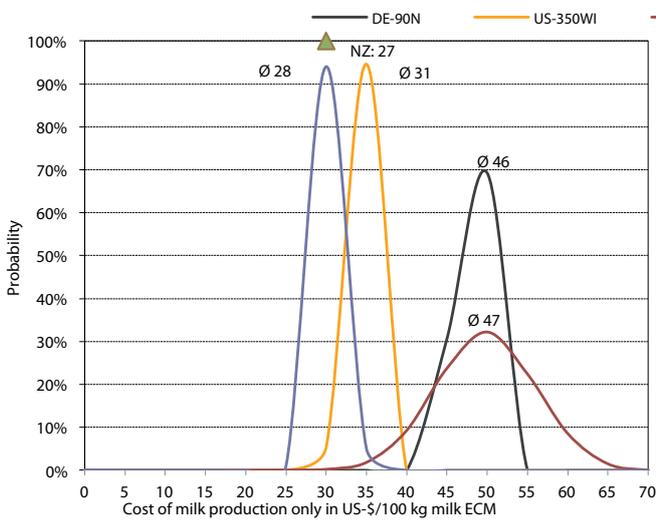
Observed milk prices Jan. 2006 - Dec. 2010



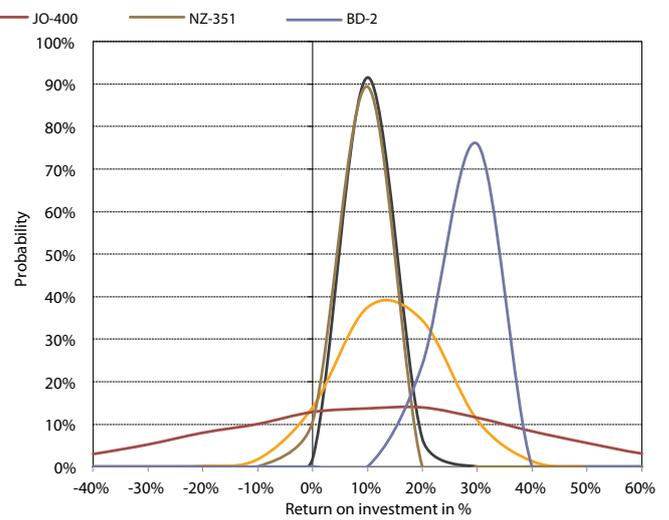
Milk prices for stochastic simulation



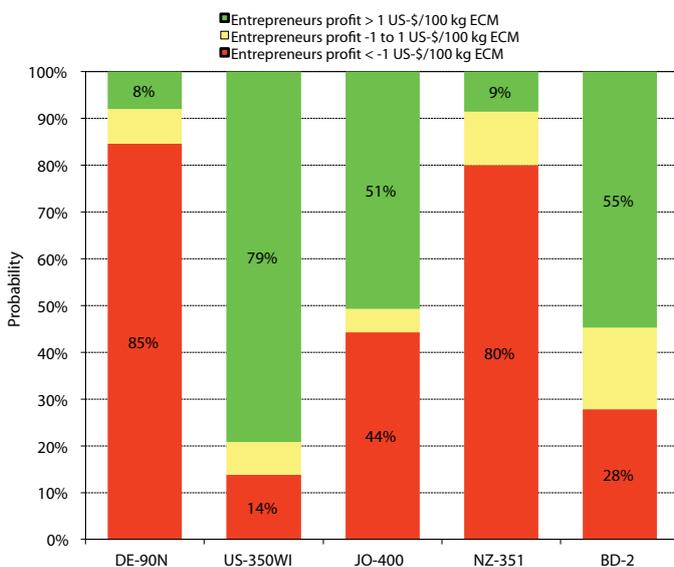
Probability function of cost of milk production only



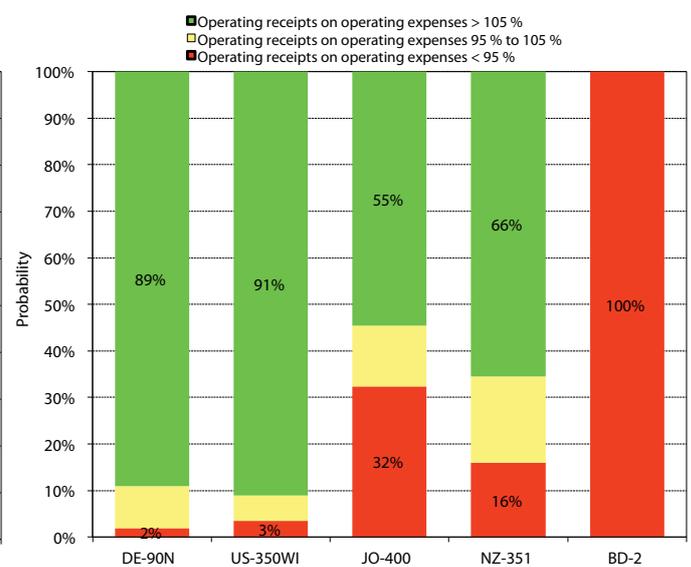
Probability function of return on investment (ROI)



Probability of success



Probability of survival





Mst. Nadira Sultana, Mohammad Uddin,
Johann Steglich, Asaah Ndambi and Torsten Hemme

Introduction

The agricultural sector consumes about 70% of today's global fresh water. Livestock production impacts heavily on the world's water supply, accounting for > 8% of global human water use and 29% of agricultural water use. Moreover, the decreasing trend of water availability is a risk to the livestock sector and thus increases the problem of food security. In the IFCN Dairy Report 2009 a country specific Water footprint (WF) analysis was made and gave rise to the need for further in depth studies of dairy production systems worldwide. Thus, the study was performed to search for ways of measuring the water footprint to produce a kg of milk. All kinds of water input used for the production of milk were taken into consideration in order to improve the water management for future farming systems.

Data and method background

Along with international standard organization (e.g. ISO-International Organization for Standardization), IFCN has created an adequate WF methodology. In general, dairy production demands large volumes of water for major inputs, for example, feed production, free water intake and servicing dairy animals. Unlike other WF studies, this research also applies the improved methodology with a flexible option to include not only major farm inputs but also various minor farm inputs (e.g. fertilizer, pesticides, fuel, electricity, etc), capital goods (e.g. building and machinery etc) and farm services (e.g. labour involved for dairy business). This study uses country-specific "virtual water (VW)" database covering a list of most conventional feed-crops produced all over the world (Chapagain and Hoekstra 2004), in order to make a regional inventory of water used for concentrate feed in the dairying sector. Drinking water requirement (DWR) for cows has been estimated by using the equation specified below: $DWR \text{ (litre/day)} = \text{total dry matter intake (kg DM/day)} * 6 + 1 * \text{milk yield (kg/day)}$. The water used for feed mixing is assumed to be 50% of the total concentrate feed intake (0.5 litre per kg concentrate feed intake) according to Mekonnen and Hoekstra (2010). The co-efficient for farm inputs used in his study is derived from the Ecolnvent database.

To handle the co-product beef for milk production only, an allocation was used (IDF bulletin 445/2010). So, the allocation relation of milk (AF) and beef (AB) production towards water footprint was calculated as a function of the ratio of the annual quantities of beef which

generate from surplus calves (or male calves), heifers and cull cows that leave the farm, divided by the annual quantity of milk produced.

Results

Global farm level results

The World map shows the total volumetric WF for 49 typical farms from different geographical regions. The WF (litres water/kg milk) ranges between 739 and 4577 for DK-128 and UG-3 farms respectively. The high milk producing (industrialized) farms, specifically from Europe, USA and Oceania where the main focus of milk production is to create monetary value, show lower WF per kg milk compared to a subsistence farming system in Asia and Africa (e.g. small-scale farm).

Country differences

A more detailed analysis was made on five selected farms from five countries, in order to investigate reasons for differences in water footprints. The three charts in the centre show WF for milk and the co-product, WF by activity and water consumed in different stages of the cow's life. At the bottom the major drivers of WF are shown. The WF for kg milk and co-product beef was highest in Jordan and Bangladesh, respectively. Milk production in Jordan is far greater than BD. However, due to climatic conditions and pronounced water scarcity in Jordan, more water is needed to produce kg DM feed, on which the ration is mostly based (16 kg concentrate DMI/day). The activity based WF analysis (centre middle figures) shows >94% is used for feed only and 1-6% is needed for others (drinking, servicing and capital goods, farm inputs etc). The WF in stages of the cow's life (centre left figure) shows that the highest percentage of water was consumed by dry cows and heifers in BD as they have a longer dry period (180 days) and first calving age (42 months) compared to all other farms. The exceptional case is the US farm where no water was used in the calf-heifer's stage because all male and female calves were sold from the farm.

Conclusion

Indirect or virtual water use through the consumption of feeds and capital goods is far greater than direct water use (e.g. drinking). The variability of WF has been observed between production systems. Finally, this WF focuses almost exclusively on volume, which is not sufficient to represent the impact on a local water resource. Moreover, further research is necessary to quantify type of water used (e.g. green, blue and grey) and to do an impact assessment-based water footprint related to regional water scarcity for efficient management of water in dairy production system.

Explanations:

Data sources: The method based on a combination of both the IFCN typical farm database 2010 and technical co-efficient has been taken from various literature sources, this being the extended version (water module) of a typical model.

Water footprint: WF of milk production can simply be defined as the total volume of freshwater that is used either directly or indirectly to produce 1 kg of milk (Hoekstra et. al., 2009).

Virtual water: It is the amount of water that is embedded in feed-fodder or other products needed for its production.

Total water footprint: $Tvwu = Wf + Wfm + WS + Wd + Wfmi + Wcg$, here $Tvwu$ =Total volume of water used (WU), Wf = WU in feed and fodder production, Wfm =WU for feed mixing, WS = Servicing water, Wd = Drinking water, $Wfmi$ = water used for farm manufacturing inputs, Wcg = WU for capital goods (e.g building, machinery etc).

Allocation factor: The equations for allocation factor of milk = $1 - 5.7717 * \text{kgbeef/kgmilk}$ and allocation factor to beef = $1 - \text{allocation factor to milk}$. Here, a carcass (or beef) weight has been assumed as 56% of live weight for different animals in the farm.

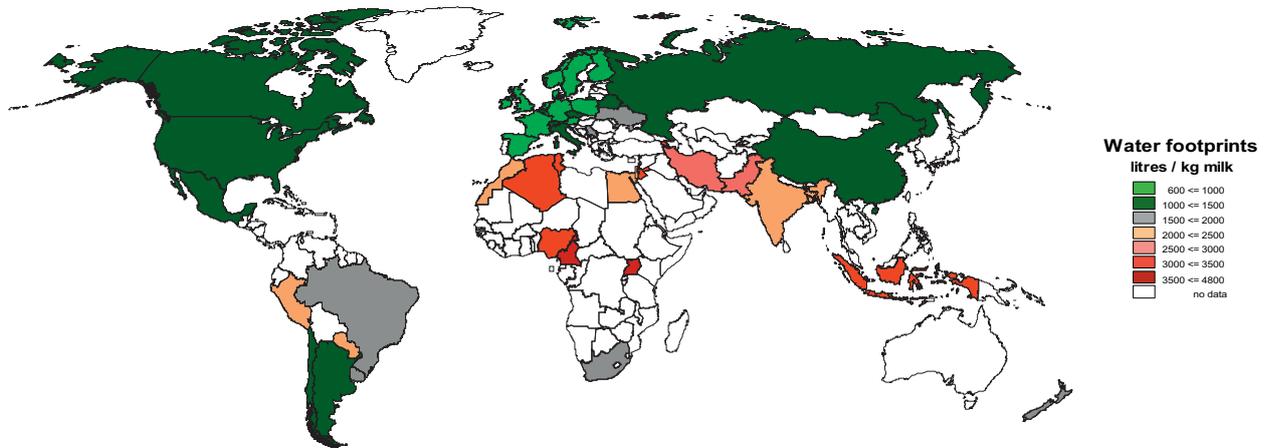
Technical co-efficient: Chapagain, A. K. and Hoekstra, A.Y. 2004. Water footprint of nations. Volume 1: Main report, Value of water research report series no. 16, UNESCO_IHE, Delta, animal products. Volume 1: Main report, Value of water research report series no.48, UNESCO_IHE, Delta, the Netherlands.

Mekonnen, M.M. and Hoekstra, A. Y. 2010. The green, blue and grey water footprint of farm animal and animal products. Vol 1: Main report, Value of water research report series no.48, UNESCO_IHE, Delta, the Netherlands.

Other sources: Sharma, B.2007. Sustainable level of water pumping to protect environment and livestock sustenance. Journal of Agriculture and Environment, 8:119-125.

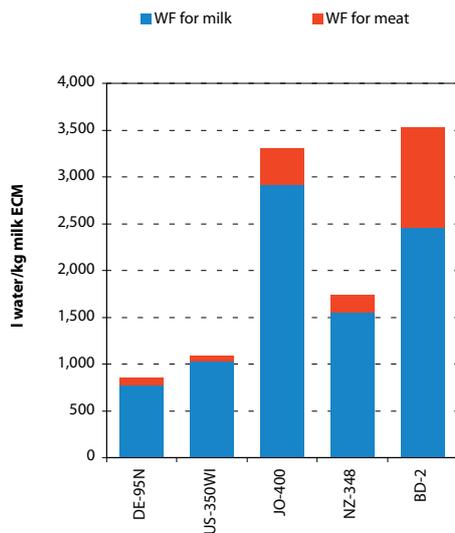
4.5 Water footprint analysis in milk production worldwide: a methodological development

Volumetric water footprint (WF) for kg milk production

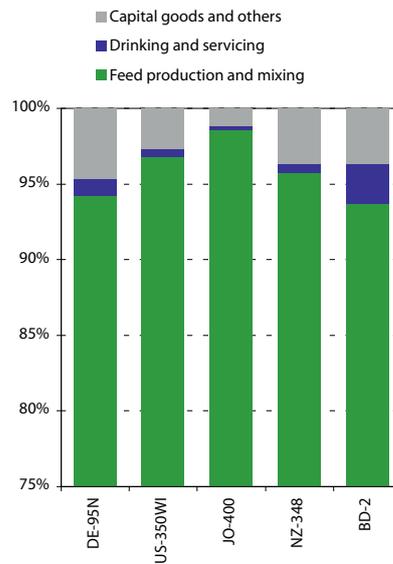


Detail analysis on water footprint of selected typical farms

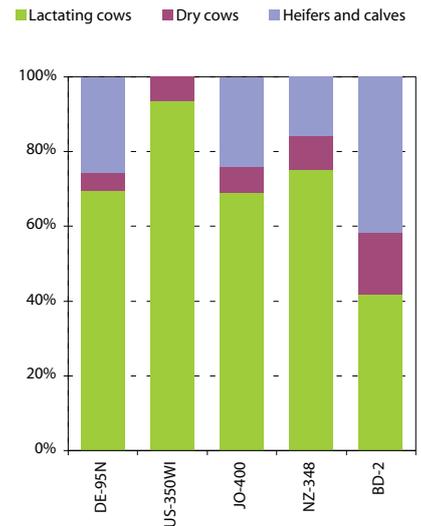
In milk and co-product (meat)



By activity

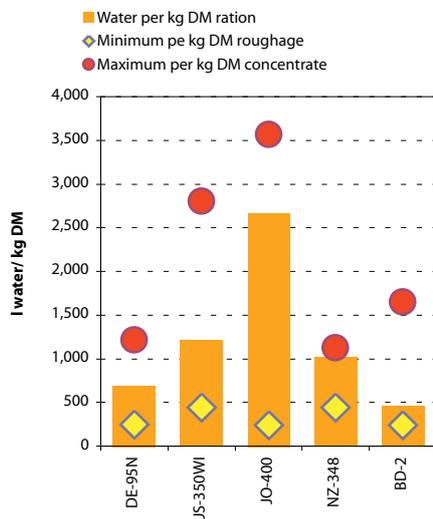


By animal type

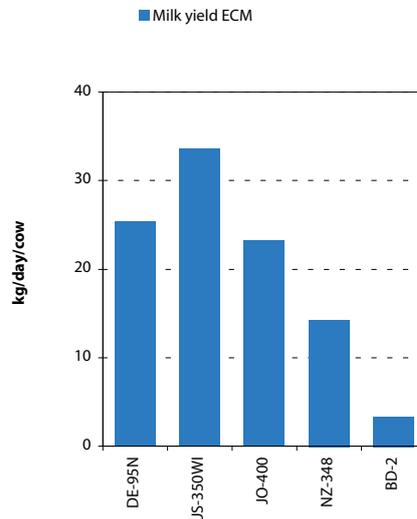


Feed ration and drivers of water footprint

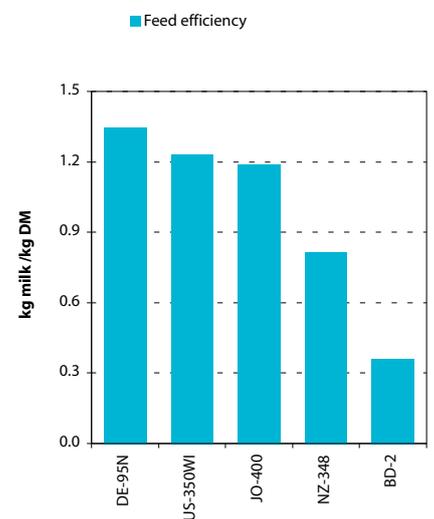
WF per kg DM feed



Milk yield



Feed efficiency



4.6 Methane emissions of dairy cattle: comparison of different estimators



Martin Hagemann, Asaah Ndambi, Othman Alqaisi, Nadira Sultana and Torsten Hemme

Introduction

Methane emissions account for the largest proportion of on-farm greenhouse gas (GHG) emissions from dairy farms. Among the sources of methane emissions from a dairy farm, enteric emissions of the cow's rumen are the main source. Hence it is of greatest importance to apply an appropriate estimation method for this source. It is the goal of this study to verify the approach which is currently used in the TIPI-CAL model. Therefore, the proportions of the three major greenhouse gases CH₄, N₂O and CO₂, and the contribution of different activities to GHG on various farms have been analysed. Secondly, a comparison of methodologies to estimate enteric CH₄ emissions is presented in order to evaluate the differences in estimations with methods based on feed intake data versus equations using physiological data i.e. milk yield and live weight.

Methodological background and data

In the TIPI-CAL model an estimation technique developed by Kirchgessner et al. (1991) is currently being used because the input variables milk yield and live weight are available for all typical farms. The prediction equation is E1 (see explanations).

In this study equations based on feed intake data are also investigated. These techniques assume that CH₄ production is affected by the type and proportion of fibre in the diet. Five equations (E) based on feed data were selected from available literature in order to investigate the sensitivity of our results (i.e., GHG emissions) to the method chosen (i.e., E1). These approaches were applied to 6 farms for which information on the diets was available. E2 and E3 are estimators based on dry matter (DM) intake. E4 is based on neutral detergent fibre (NDF) intake, E5 on acid detergent fibre (ADF) intake and E6 is based on all NDF, ADF and DM intake. E2, E4, E5 and E6 are linear approaches investigated by Ellis et al. (2007). E3 is a nonlinear estimator reported by Mills et al. (2003) who stated that nonlinear models are less prone to misapplication than their linear alternatives while improving prediction. The standard errors (SE) of the equation parameters and R-squared (R²) are in parentheses (see explanations).

The analysis was conducted on 6 farms which represent the most common dairy farming systems. Farms with the most detailed feed information were selected from each farming system. These were a forage based system with 80 cows in Northern Germany (DE-80N), an intensive dairy farming system with a high share of concentrate in the feed ration with 1710 cows in California (US-1710CA), a grazing system in New Zealand with 294 cows (NZ-294) and one in Brazil (Rio Grande do Sul) with 25 cows (BR-25RS). The remaining two farms are small-scale, being a 2 cow farm in Bangladesh (BD-2) and a 1 cow farm in Cameroon (CM-1).

Results – Emissions by gases and activities

The breakdown of total GHG emissions into gas components was examined in absolute and relative terms. The graph shows that methane accounted for the highest share (54-69%) and nitrous oxide for the se-

cond largest component (22-32%) of total emissions across all farms. Emissions from the 6 selected farms were also examined by source to distinguish emissions from enteric fermentation, manure, fertilizers, energy consumption (i.e., fuel, lubricants, electricity), purchased feed and other sources such as machinery, buildings and bedding. The results are shown in absolute amounts (left panel) and as relative proportions (right panel). It is important to note that for farms in NZ, BR, BD and CM, animal related enteric and manure emissions comprised 80 to 94% of total emissions, while these emissions accounted for about 70% in the farms from DE and US. On the other hand, these farms emitted higher indirect emissions from fertilizer, energy consumption, purchased feed and other sources than farms in NZ and BR. In the small scale farms of BD and CM, the share of non-animal related emissions was about 6%.

Results - Enteric methane emissions

Two types of models to predict enteric CH₄ emissions were applied to the data for the 6 selected farms. Estimates of enteric emissions using the Kirchgessner model, which is based on the physiological parameters milk yield and live weight, were the lowest for all 6 farms. Total CO₂-eqv/100 kg ECM would thus be higher if a method other than the Kirchgessner model were chosen. The results show that predicted enteric emissions are least sensitive to the method chosen in the DE and CM farms and most sensitive in the BR farm. The largest difference in predicted emissions among the 6 in-depth studied farms occurred for the BR and BD farms, with about 150 kg and 200 kg CO₂-eqv/100 kg ECM, respectively.

Among the methods that consider feed intake, the linear approach of E2 (Ellis et al., 2007) estimated lower GHG emissions than the non-linear model of E3 (Mills et al., 2003). Results show that emissions predicted by E3, which is based on DM intake, E4 which is based on the NDF content of the diet (Ellis et al. 2007) and E6 which is based on the NDF and ADF contents of the diet and DM intake (Ellis et al. 2007) were similar. The linear E2 which is based on DM intake and E5 which is based on diet ADF content predicted similar results.

Conclusion

Methane from enteric emissions accounted for the highest proportion of GHG emissions. All animal related enteric and manure emissions accounted for 70 to 96% of total GHG emissions on farms, depending on the farming system. Comparison of methods to estimate enteric emissions revealed that models based on milk yield and live weight tended to underestimate emissions compared to feed based models. In order to improve estimates, we recommend that future research should cluster dairy farms into farming systems based on feed usage (e.g., grazing, intensive feed input systems) and apply feed based equations (due to differences among farm clusters in DM, NDF, ADF, CP and metabolizable energy intake) in order to estimate GHG emissions. There is also a need for development of approaches based on milk yield and live weight through calibration via in vivo research in individual countries. The advantage of this approach is the better availability (i.e., easier measurability, of input data such as milk yield and live weight) than for approaches based on feed input data.

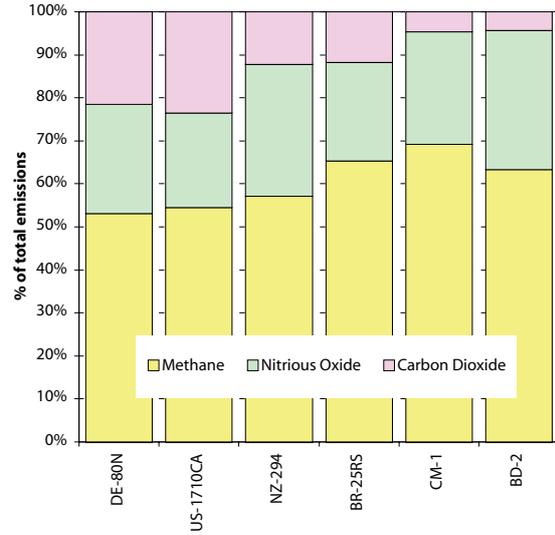
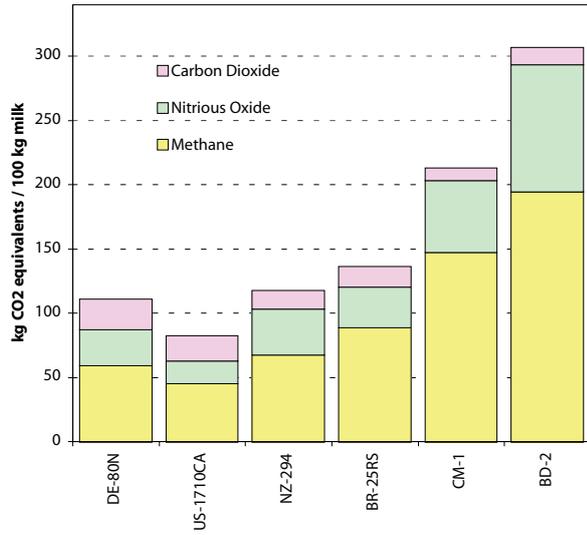
Explanations:

Data sources: Dairy Report 2007. **Equations:** **E1:** CH₄ (g/d) = 55 + 4.5 × kg milk yield/cow/d + 1.2 × liveweight 0.75; **E2:** CH₄ (MJ/d) = 3.23 (SE 1.12) + 0.809 (SE 0.0862) × DM intake (kg/d) (R² 25.6%); **E3:** CH₄ (MJ/d) = 56.27 - (56.27+0) × e[-0.028×DMI (kg/d)] (R² 28.9%); **E4:** CH₄ (MJ/d) = 3.14 (SE 1.88) + 2.11 (SE 0.407) × NDF (kg/d) (R² 35.0%); **E5:** CH₄ (MJ/d) = 5.87 (SE 1.77) + 2.43 (SE 0.556) × ADF (kg/d) (R² 35.4%); **E6:** CH₄ (MJ/d) = 2.16 (SE 1.62) + 0.493 (SE 0.192) × DM intake (kg/d) - 1.36 (SE 0.631) × ADF (kg/d) + 1.97 (SE 0.561) × NDF (kg/d) (R² 28.2%).

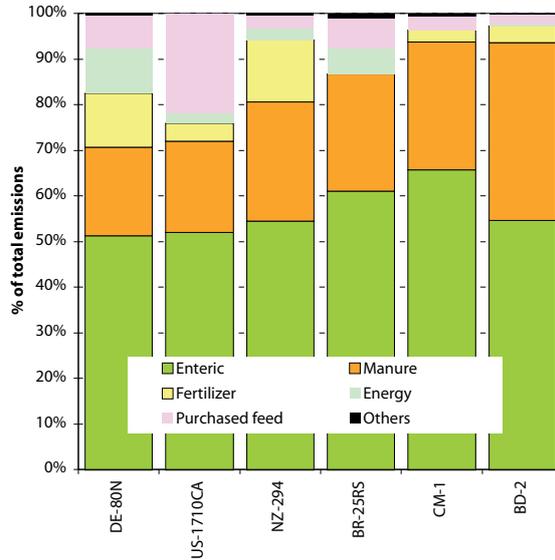
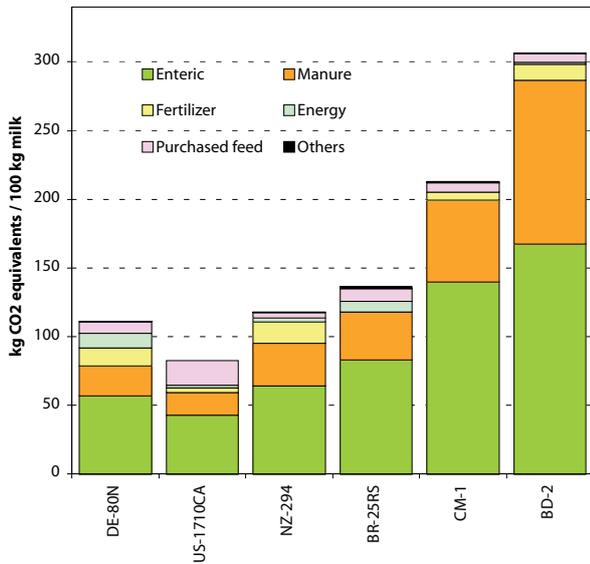
Literature: Ellis JL, Kebreab E, Odongo NE, McBride BW, Okine EK, France J, 2007. Prediction of methane production from dairy and beef cattle: *J. Dairy Sci.* 90, 3456-3467. Kirchgessner M, Windisch W, Müller HL, Kreuzer M, 1991. Release of methane and of carbon dioxide by dairy cattle. *Agriobiol. Res.* 44, 91-102. Mills JAN, Kebreab E, Yates CM, Crompton LA., Cammell SB, Dhanoa MS, Agnew RE, France J, 2003. Alternative approaches to predicting methane emissions from dairy cows. *J. Anim. Sci.* 81, 3141-3150.

4.6 Methane emissions of dairy cattle: comparison of different estimators

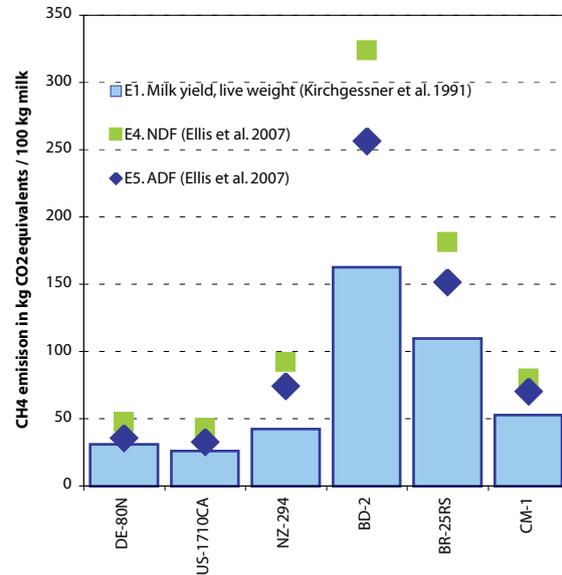
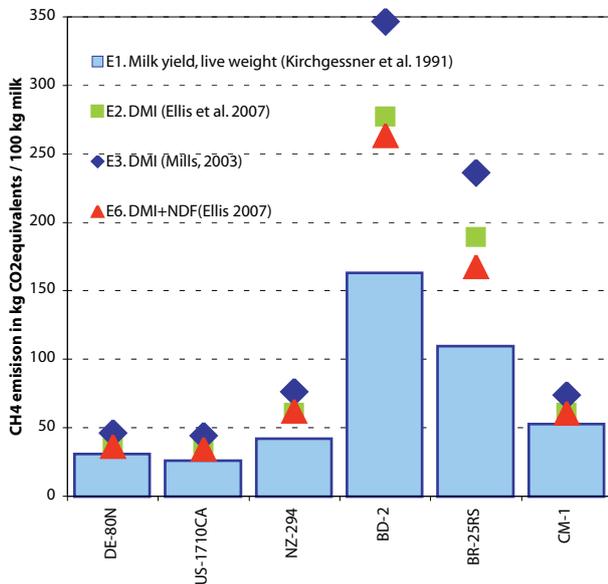
Emissions by gases



Emissions by activities



Enteric methane emissions using different equations





Karin Wesseling and Eva Schröder-Merker

Introduction

The farm structure information of different countries is as diverse as it is complex and shows the country specific view. Every second year the Country Page focusses on national farm structure. The aim of this study is to illustrate the new IFCN Standard Classes approach which permits a comparison to be made among countries.

Data and methods

The farm structure information shows the farm and cow numbers per cow-size class. The analysis is based on 78 countries. The farm structure data we receive is very diverse in terms of: years shown (from 1 to 15 years), number of size classes used (from 2 to 10), the dimensions of the size classes used and status of aggregation (national, regional or production system level). The aim of the IFCN Standard Classes approach is:

- to have comparable farm structure information between the countries which permits conclusions to be made for the world and selected / single countries and regions
- to keep the method simple to handle and easy to understand.

The following 7 IFCN Standard Classes were chosen: 1-2; 3-10; >10-30; >30-100; >100-300; >300-1000; >1000. These standard classes were used for all countries. The country specific farm structure was allocated to it. For the analysis, the 2010 figures were used to show the most recent year. For countries where no 2010 figures were available, a trend estimation based on the past three years was made. If only one year of farm structure data was available the same share was used for the 2010 absolute figures.

Results

On the following page, the preliminary results are shown. They are based on the same sample of countries but shown in different clusters to point out specific information.

IFCN Standard Classes – World 2010

The aggregation on world level shows that the world is still dominated by small farms as 52% of farms have 1-2 cows and 26% of farms have between 3 and 10 cows. Only 0.3% of farms have more than 100 cows. The second pie chart shows the distribution of dairy cows / buffalo into the new size classes. The percentage of cows on farms with less than 10 cows is still predominant (56%) but less than in the first chart. The larger farms show greater weight as there are many cows on few farms. This results in 16% of the cows being kept in farms of more than 100 cows.

IFCN Standard Classes – World and world regions 2010

The second group of charts show the same countries but in different clusters. The clustering into developed and developing countries gives the chance to look at the relation between the development status of countries and farm structure, while the clustering into regions shows the relation of regions and farm structure.

Explanations:

Data sources: Country Page analysis 2011. Data: dairy farm numbers: 76 countries; dairy cow / buffalo numbers: 78 countries.

Data preliminary or est. for 2010: CH, AT, BE, LU, FR, GR, IE, IT, PT, UK, CZ, SI, HU, PL, EE, AM, BY, RU, RO, TM, MK, RS, MX, JM, AR, CO, UY, GT, AU, TR, CN, IN, PK, BD, MY, PH, TH, ID, VN, MA, DZ, UG. **Developed countries:** 31 countries = EU-27 (excl. LV, LT, BG, RO) and the following countries: NO, CH, IS, CA, USA, AU, NZ, IL, JP and KR as specified by Wikipedia.org.

Developing countries: All other countries (47) where data was available. **Regional data:** W Europe = Western Europe (18), CEEC = Central Eastern European Countries (22),

Middle East (3), Africa (9), N America = North America (2), S America = South America (9), Asia (13), Oceania (2) Number in brackets shows number of countries included in this study.

Dairy farms with a herd size between 10 and 100 cows are the main herd size in the developed countries (57%). A similar trend is seen for the following regions: Middle East, Western Europe and North America, whereas in the developing countries, 78% of the herd size classes corresponds to farms with less than 10 cows. The regional clusters show that classes of this size are also the dominating ones in CEEC, Africa, Asia and South America. In Oceania there are large farms with an average herd size above 100 cows (NZ: 376, AU: 213).

The first results show that more than 50% of cows in the developed countries are kept on farms with more than 100 cows, whereas in the developing countries most of the cows are on farms with herd sizes below 10 cows (63%). These size classes dominate the dairy sector in CEEC, Africa and Asia. In South America and Middle East the cows in farms below 10 cows account for 43% and 25%. In Western Europe more than 80% of cows are held in the size classes above 30 cows. In North America it already accounts for 98% and almost 80% of cows are kept in the size classes above 100, while in Oceania it is nearly 100%.

IFCN Standard Classes – Selected countries 2010

The clustering into dairy cows / buffalos per size class permits also preliminary conclusions to be made about the milk produced within size classes. Here a simple approach is used. Multiplying the cow numbers within the size classes by the average milk yield in the country results in the amount of milk produced per size class. The selected countries show the specific size classes accounting for the main share of milk produced, which varies greatly even in neighbouring countries.

Limitations

The approach still faces challenges. Since not all countries of the world are involved, conclusions about the world and regional distribution of dairy farms and dairy cows / buffalos in the IFCN Standard Classes have to be taken as indicative. Moreover the difference in national farm structure updates (update period, updating method and changing methods) affects the results. The allocation of national data into the new classes sometimes requires estimations for distributing the data and so far has not been crosschecked with the country partner. In order to obtain preliminary results on the share of milk production to cow size classes, a simple calculation of milk per size class (via average country milk yield) is used which does not take into account that in many countries larger farms also have higher milk yields.

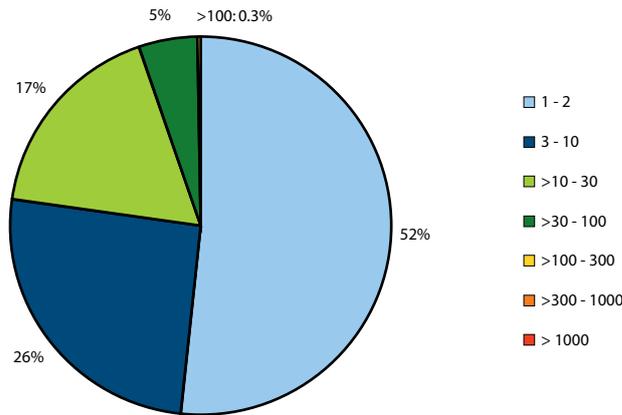
Conclusion

With this analysis a first step was made to standardise farm structure information and highlighting its opportunities. The IFCN Standard Classes permit a comparison to be made among countries as well as the clustering of regions / world. The preliminary results should be treated with care. Ideas to further develop this concept are very much welcome.

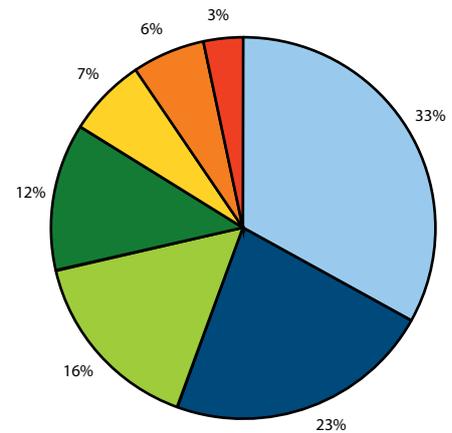
4.7 Farm structure: IFCN Standard Classes – Comparison among countries

World 2010

% of dairy farms in size classes

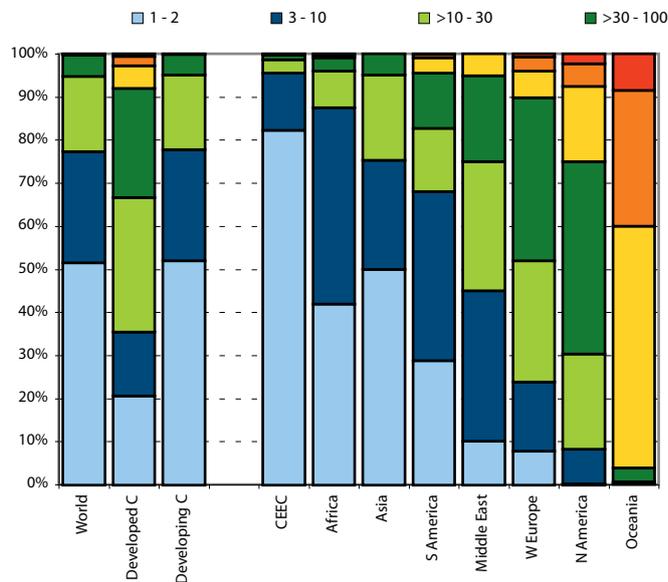


% of dairy cows / buffalos in size classes

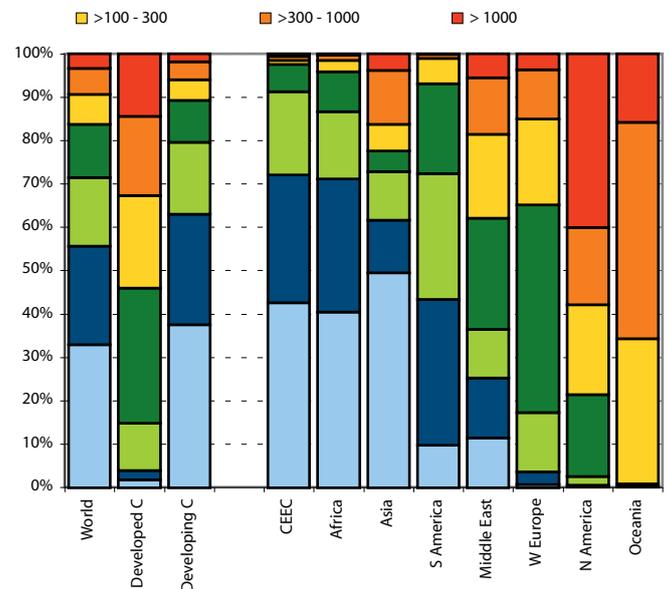


World and world regions 2010

% of dairy farms in size classes

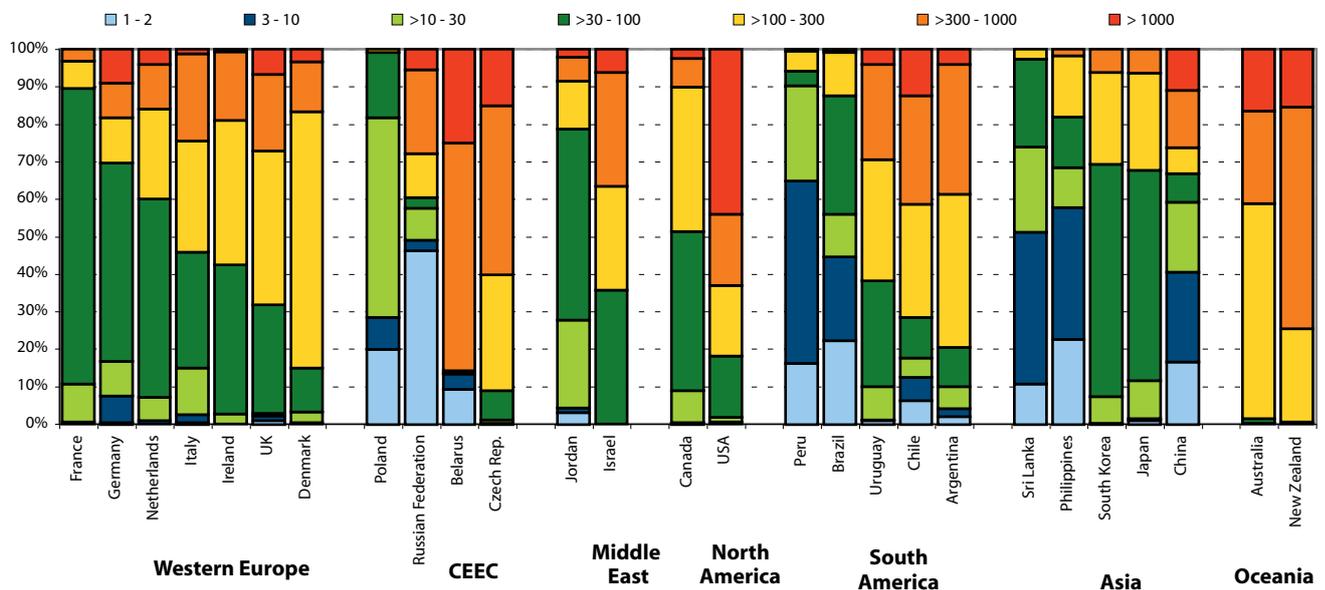


% of dairy cows / buffalos in size classes



Selected countries 2010

% of milk produced in size classes





Wiebke Reinecke and Mikhail Ramanovich

Introduction

Milk consumption in China has increased during the last decade but is still low compared to international levels. Considering that China accounts for 20% of the world's population, even small changes in per capita milk consumption result in significant milk volumes which have an impact on the global dairy market. This study focuses on the demand of the Chinese dairy sector and attempts to forecast at which level the Chinese milk consumption will be in 2020.

Levels of milk consumption in China

In the global comparison, China belongs to the group of countries with low per-capita milk consumption as well as low income (see red circle in Chart 1). When observed within the Asian context (Chart 2) the level in China is still very low, which highlights the growth potential of the Chinese milk consumption.

Levels of milk consumption can be calculated for specific regions split into rural and urban areas, as well as for the whole country, using different data and methods (for method explanation see footnote). The per-capita consumption in urban areas varies from 12 to 47 kg (ME) with an average of 29 kg in 2009 (see map 1). In rural areas the per capita consumption varies from 1 to 247 kg (ME) with an average of 25 kg in 2008 (see map 2). By excluding from the average the rural regions with traditionally quite high per-capita milk consumption (Tibet, Qinghai, Inner Mongolia) leads to a more representative rural milk consumption of 12 kg (ME) in 2008. The average level of milk consumption in China is about 20% higher when using country data than when using regional statistics. This is due to data limitations, as regional statistics include main dairy products only, without considering milk components in other foodstuffs and out of home consumption.

Method and data

Model: The following consumption function was applied: $C = f(Y, P, x)$
 C = milk consumption per-capita, Y = income per-capita, P = consumer milk price, x = residue.

Growth rates of income and price as well as income and price elasticities for the prognosis are calculated based on 2000-2009 regional data using a regression analysis. As calculated price elasticities were not reliable, standard milk price elasticities of -0.2 for urban areas and -0.5 for rural areas from FAPRI (2011) were applied.

Data: The data used for the analysis were taken mainly from different official Chinese data sources.

Income and milk consumption relation: Income elasticities for all regions in China were calculated by the relation of the average per-capita income and consumption 2000-2009, based on the data for the 23 most representative regions. Results show a declining income elasticity for milk if incomes rise. This indicates that in the future rising incomes in China will result in a proportionally lower

growth of per capita milk consumption. For all regions an average income of 21,000 RMB per capita and year was calculated as the level at which the income elasticity becomes zero (Chart 3). No income effect on milk consumption can be seen above that income level. The assumption was also made, supported by observations in other Asian countries, that the income elasticity does not become negative.

Calculation of scenario development for 2010-2020: For 2011-2020 the described consumption function was applied to calculate regional milk consumption. Due to the effect of the melamine crisis, 2010 was a special year for the Chinese milk market and consumption. No official 2010 data were published up to the compilation of this study, so a "Rebound effect" of 8% consumption growth for all regions, as well as a price increase of 11.5% in 2010 were assumed.

Results

Regional milk consumption: Development scenarios for milk consumption were calculated for all urban areas. Chart 4 illustrates the results for the Jilin region, which was considered representative for China. Line (a) shows income effect on consumption; Line (b) shows price effect on consumption. The combined effect of both milk price and income is shown as line (c) and is the base for all further calculations and conclusions. The per-capita consumption of milk for 2020 in the Jilin region is calculated as being 38 kg (ME) per year (26 kg in 2009). The average consumption for the urban areas will be 39 kg (ME) and will range from 17 to 65 kg (ME). The same consumption function, growth rates, income and price elasticities were applied for the rural areas. The average level of milk consumption in rural areas of China (without special regions) is calculated as being 35 kg (ME) per year in 2020, ranging from 3 to 54 kg (ME). As a result of the scenario analysis we can conclude that the Chinese milk consumption level for 2020 will be about 40 kg per capita.

Scenario for the country consumption and balance in 2020:

The calculation of the consumption of the whole country was based on regional results, taking into account regional population trends (share of urban/rural). The results show a total Chinese milk consumption of 62.8 mill t in 2020. This calculation also takes into account the 20% of underestimation. If an annual milk production growth of 4, 5 or 6% is assumed, it would lead to a deficit of 3 to 14.5 mill t of milk in 2020.

Conclusion

There are good reasons to expect further growth for the Chinese milk consumption. The results of the analysis indicate that consumption and imports of milk products in China will rise in the future. Uncertainties that can be limiting factors in this analysis are the development of the milk production in China, changing consumption preferences caused by quality issues, changes in consumption patterns (e.g. unpredictable rise of cheese consumption), the speed of urbanisation, the world market price trends and exchange rate developments.

Explanations:

Methods used to calculate per-capita milk consumption:

Method 1: Regional milk consumption in ME calculated from the different dairy products consumed (fresh milk, milk powder, yoghurt). Milk equivalents (ME) applied: 1 kg fresh milk = 1 kg ME, 1 kg yoghurt = 1 kg ME, 1 kg milk powder = 7 kg ME. This method was applied for urban areas. **Method 2:** Regional milk consumption calculated from the total milk expenses divided by consumer price for fresh milk in cities. This method was applied for rural areas. **Method 3:** Whole country milk consumption = milk production + imports - exports.

Data sources: China Dairy Yearbook (2005-2009), China Statistical Yearbook (2000-2009), China Dairy Data (2010); for population of China: UN (2011). The regression explains that on average 75% of the change in milk consumption of the regions is based on the independent variables (income and price). **Price elasticity for milk:** -0.2 for urban areas of China, -0.5 for rural areas of China (FAPRI 2011).

Literature: Reinecke, W. (2011): Entwicklung der Milchnachfrage in China - Eine regionalspezifische Analyse und Prognose (Development of the milk demand in China, a regional analysis and outlook). Master's Thesis, University Kiel

Chart 1: Per capita milk consumption and income, world-wide comparison (Ø 2004-2009)

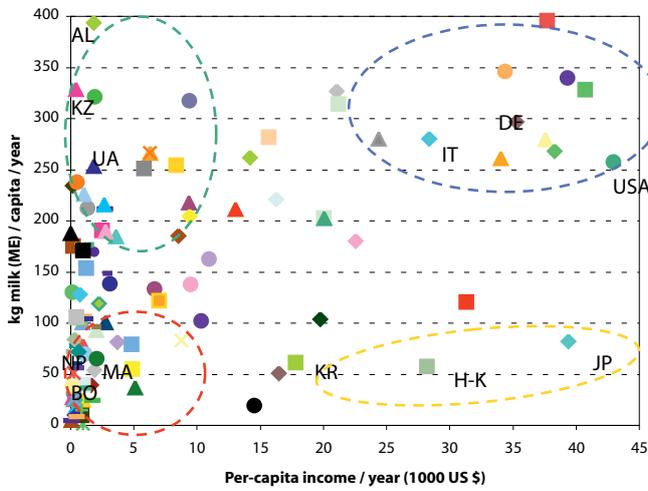
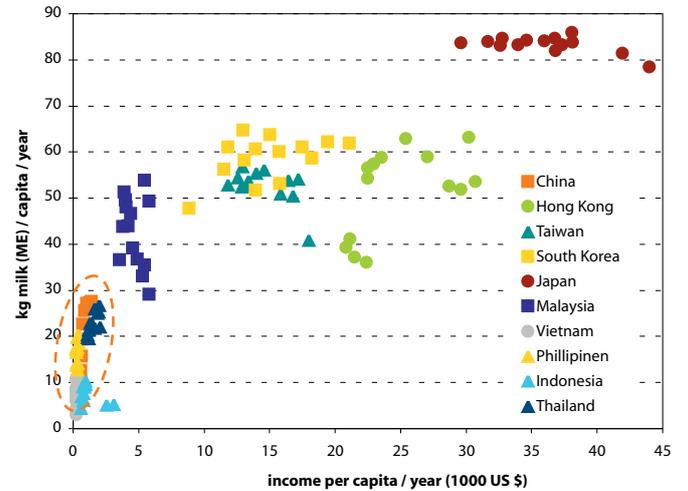
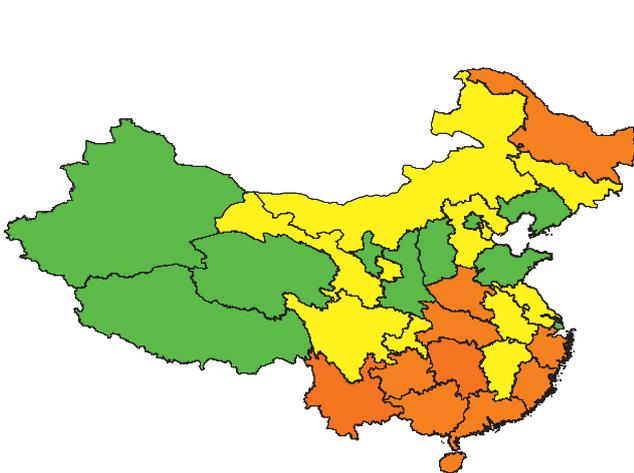


Chart 2: Per capita milk consumption and income, comparison of selected Asian countries (1996 - 2009)



Milk consumption levels in China, kg (ME) per capita per year

Map 1: In urban areas of regions (2009)



Map 2: In rural areas of regions (2008)

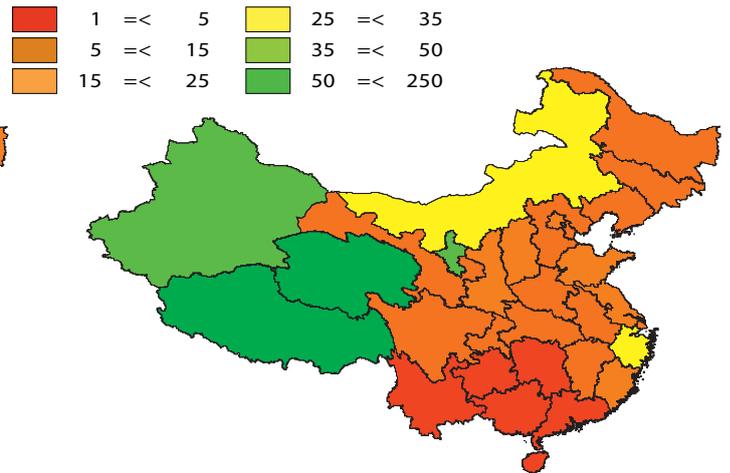


Chart 3: Income and milk consumption relation in China urban areas of China, average 2000-2009

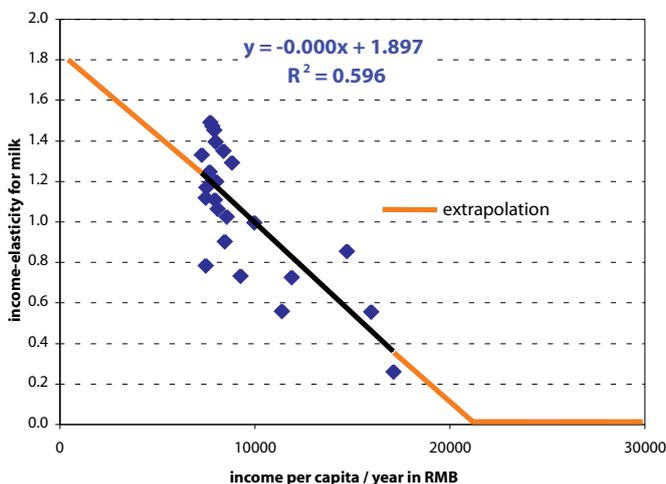
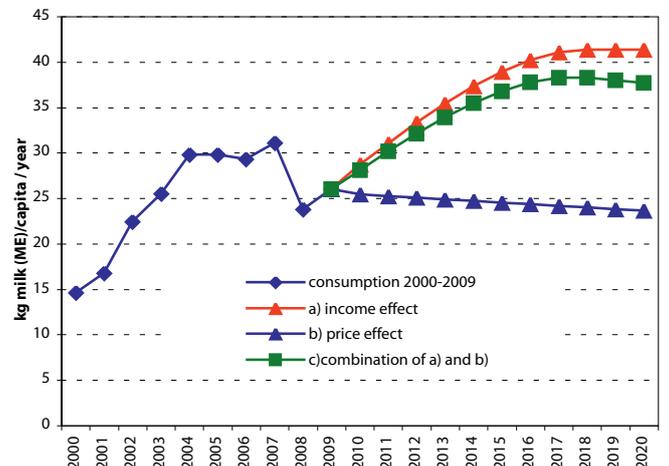
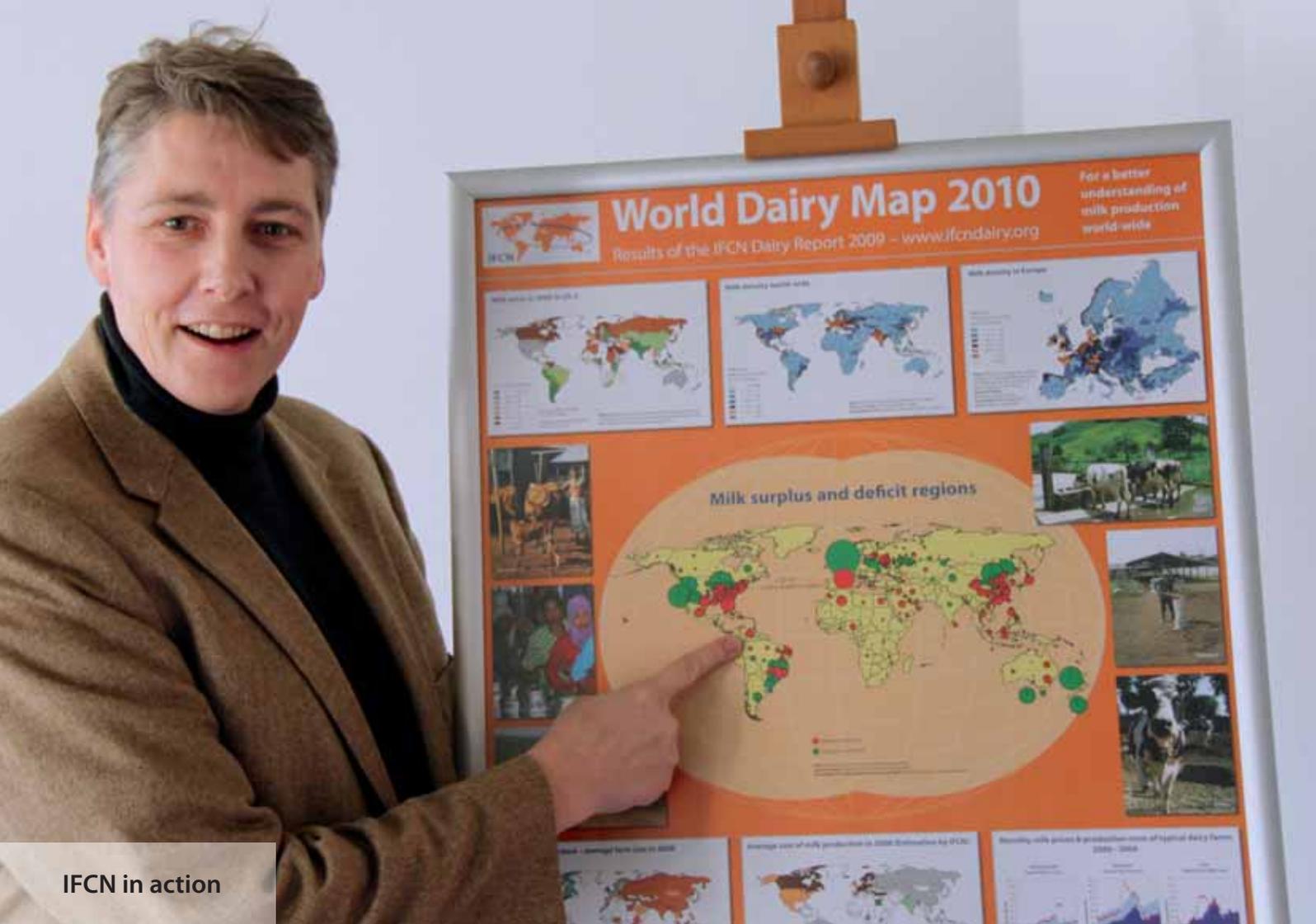


Chart 4: Scenario for milk consumption development urban area of Jilin region, kg per capita per year







This double page: IFCN Dairy team and its activities in 2011

Annex

A.1	12 th IFCN Dairy Conference – 6 th to 8 th of June 2011 in Kiel, Germany	190
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A.1 12th IFCN Dairy Conference - 6th to 8th of June 2011 in Kiel, Germany



Participants of the IFCN Dairy Conference 2011

Farm Comparison day – 6 th of June	Dairy Sector Analysis day – 7 th of June	IFCN strategy and outlook day – 8 th of June
<p>Welcome & opening by IFCN Dairy Research Center and IFCN Board</p> <p>Farm comparison</p> <ol style="list-style-type: none"> 1 Status and trends of world milk production 2 Farm comparison results 2011 3 Sustainability of milk production <p>Workshop session 1</p> <ol style="list-style-type: none"> 1 a) Sustainability 1 b) Feed 1 c) Farm structure 1 d) Scientific paper session <p>Workshop session 2 Understanding farming systems in the world</p> <ol style="list-style-type: none"> 2 a) Austria, Czech Republic, China 2 b) Switzerland, Iran, South Africa, Brazil 2 c) Spain, Bangladesh, USA 2 d) France, Canada, Belarus, Algeria <p>Invited presentations Global Livestock Production Systems: Mapping and Applications Harinder Makkar, Tim Robinson and Carolyn Opio</p> <p>One year discover the dairy world by bicycle Arnaud Baranger</p>	<p>Opening by IFCN DRC</p> <p>Dairy sector analysis</p> <ol style="list-style-type: none"> 1 Developments of world milk price and dairy commodities until 2011 2 Discussing the drivers for world milk price developments 3 Milk production and consumption in different world regions 4 Country prices related to dairy <p>Outlook workshops</p> <ol style="list-style-type: none"> 3 a) EU-27 3 b) CEEC 3 c) North America & Oceania 3 d) Asia <p>Outlook workshops</p> <ol style="list-style-type: none"> 4 a) EU-27 4 b) Middle East 4 c) Latin America 4 d) Africa <p>Open discussion of outlook results</p> <p>Farewell evening at Landgasthof Falkenhorst close to the beach Global Livestock Production Systems: Mapping</p>	<p>Opening by IFCN DRC</p> <p>IFCN dairy outlook for 2011-12 World milk production outlook 2011-2012 (Results of the workshops) World milk supply / demand balance 2011-2012 Possible world milk price scenarios</p> <p>IFCN Strategy Implementation</p> <p>Evaluation and feedback on the conference</p> <p>Taking home messages</p> <p>Closing</p>

IFCN Awards 2011

The IFCN awards were institutionalised in the year 2005 to acknowledge very good research within the IFCN Dairy Network. The 2011 winners were chosen by the award committee formed this year by A. Fagerberg, T. Hemme, E. Reyes.

I-Award for the best innovation: This award was given to Othman Alqaisi (Jordan) and Johann Steglich (Germany), IFCN Dairy Research Center, for innovative ideas on feed analysis.

F-Award for the fast and reliable cooperation in IFCN: The award was given to Michel de Haan (The Netherlands), Wageningen UR Livestock research, for the fastest results and prompt correspondence.

C-Award for the best conference presentation: This award was given to Zelalem Yilma (Ethiopia), FAO-SFE, for his excellent presentation about Ethiopia in the outlook workshops.

N-Award for the best network contribution: This award was dedicated to Lorildo Stock (Brazil), Embrapa, for his continuous cooperation & contribution to IFCN.

A.2 8th IFCN Supporter Conference – 22nd -24th November 2011 in Rennes, France



Participants of the IFCN Supporter Conference 2010

Conference facts	Dairy markets & farm economics – 23 rd of November	Workshops on “Dairy 2025” – 24 th of November
<p>Location: Rennes, France</p> <p>Hosting companies</p> <div style="border: 1px solid black; padding: 5px; display: flex; justify-content: space-around;">   </div> <p>Participants: Over 75 representatives from more than 50 dairy related companies were participating in the conference</p>	<p>Opening by IFCN</p> <p>Dairy content presentations</p> <ol style="list-style-type: none"> 1 Global dairy market trends 2 Country specific milk prices 3 Results of the farm comparison analysis 4 Innovative results of the farm comparison analysis 5 IFCN Dairy outlook 2011 <p>Field trip Visiting a 120 cow farm in Brittany</p> <p>Podium discussion at Lactopole “My vision for the dairy future” Panel discussion with dairy farmers & hosts on their future perspectives</p> <p>Visit of Lactopole museum</p> <p>Networking evening at Lactopole</p>	<p>Opening by IFCN DRC</p> <p>Workshop session: Topic: „How does the dairy world look like in 2025?“</p> <p>Reporting session of the workshops</p> <p>Taking home messages Evaluation Feedback round Closing</p>
<p>Welcome day – 22nd of November</p>		
<p>Welcome & Opening by IFCN Dairy Research Center & Anders Fagerberg</p> <p>IFCN Vision 2015 & business modell</p> <p>Welcome evening in the Mercure Hotel Centre Gare</p>		



A.3 Typical farm approach and data quality assessment

1. The “Typical farm approach” (TFA)

The key issue in creating high quality farm comparison results is to apply the same method to all farms. Therefore this section describes the Standard Operating Procedure, called „Typical farm approach“ (TFA). The TFA has 3 elements: 1. Definition of the typical farms, 2. Data collection, 3. Data analysis / validation.

Definition of the typical farms

The inception of using typical farms or representative farms in economic analysis occurred in 1928 when Elliot defined a typical farm as being “a modal farm in a frequency distribution of farms of the same universe; or it is representative of what a group of farmers are doing who are doing essentially the same thing” (*Dillon and Skold, 1992).

In IFCN, a typical farm represents a certain production system, farm size, production technology used and the related milk volume in a country/dairy region. The technical and economic data to describe the typical farms are preferably neither individual farm data nor statistical averages but based on a consensus achieved in a panel meeting. Two typical farms (and a third one occasionally) are set up in each region. First farm: Mode sized farm with average management performance (mode is the value that occurs most frequently). Second farm: This farm is larger than the first one, to show economies of scale. It should also have an average management performance. The third farm (which is usually optional) could represent, for example, a „future farm“ which is larger than and/or has better management than farm 2.

2. Data collection and validation (see column “data collection” in table next page)

- 1. Panel approach:** A panel (farmer, advisor and scientist) discuss the data and agree on the results of the typical farm.
- 2. Statistical approach only:** The data are taken mainly from accounting statistics and are discussed among dairy experts to create a typical farm.
- 3. Single farm approach only:** The data are taken mainly from a single farm and are discussed among dairy experts to create a typical farm.
- 4. Single farm case:** The data are taken from a single farm. The data represent this single case rather than a type of dairy farm in the region.

Data analysis / validation

This is a very important step of the TFA on which we began to focus more since 2010. After including the data into the TIPI-CAL model, a cross check of the results is vital as an initial step to the data validation process. It can be performed via a) a review with accounting statistics b) a review with a panel of farmers c) a review with national experts d) own review of results by country partner and e) other review methods adapted to the country situation.

3. Data quality assessment

We developed the concept of a quality assurance system further compared to last year. The classification is now based on 4 main areas: a) sourcing of farm data, b) farm data quality c) selection of typical farms, d) communication between the partner and the IFCN. This classification considers all steps which are taken before the data gets ready. The grade presented in the table shows an overall grade for quality obtained by calculating the average for the four areas mentioned above.

Based on this classification, all farms have been graded into three quality groups:

- 1. High quality:** Good selection farms, data collection and validation
- 2. Moderate quality:** Minor challenges in farm selection and/or data collection and validation
- 3. Lower quality:** Major challenges in farm selection and/or data collection and validation

For details, see table on the next page.

Challenges in data quality

Five major challenges were identified based on the data quality assessment.

- a). Sourcing of farm data** is a challenge in most developing countries and in developed countries where accounting statistics are not available. Many partners who plan to source their data from panels sometimes fail or are too late because they underestimate the preparations in setting up a panel. As this is the best option in most countries, we recommend this approach and like to draw your attention to the fact that it takes time to organise and to have a good panel. Therefore you should plan your panel meetings early enough ahead of the deadlines.
- b). Completeness and consistency of data sets:** We face the challenge of getting incomplete data sets. This requires lot of time from the IFCN responsible person and the partner in trying to get the rest of the data and in making it consistent.
- c). Selection of typical farms:** To make a comparison between farms which are really comparable we need to select the “right” typical farms. These need to have an average management level and at the same time have a typical herd size and structure for the country or region. Some countries still use better managed farms and farms which have more cows than the size-group which is typical for the country. Defining the right typical farm is therefore one of the biggest points to work on.
- d). Timeliness in data delivery:** The farm data quality is strongly influenced by the source, but also by the validation steps. When data is received late, important check loops of the IFCN are missed. Ensuring high quality is a challenge in these cases.
- e). New countries in the FC:** Since the Dairy Research Center needs time to understand dairying in new countries and the new partners also need time to get used to IFCN methods, it is usually a challenge to get good quality results from new countries. New countries in 2011 are: Algeria, Armenia, China (Heilongjiang), Iran, Morocco and Tunisia. They have the letter “N” besides the data quality to show that they are new. Details on the data quality are shown in Table 1.

4. Time period for farm data

Differences in the analysed time period for farm data (calendar vs. accounting year/season) can lead to different results in farm economics, especially in times of volatile prices such as the present. Five groups of countries were classified based on the period of data collection:

Time period for farm data:

1. Calendar year 2010
2. Financial year or season 2008/2009 indexed to calendar year 2010
3. Calendar year 2009 indexed to calendar year 2010
4. Financial year or season 2009/2010
5. Financial year or season 2010/2011

Explanations

*Dillon F M and Skold M D 1992 'Typical Farm Theory in Agricultural Research', *Journal of Sustainable Agriculture* 2 (2): 43-58.

A.3 Typical farm approach and data quality assessment



Farm	Data collection	Time period	Farm data quality
NO-20	2/3	1	1
NO-36	2/3	1	1
CH-17	2/3	1	1
CH-23	2/3	1	1
CH-64	2/3	1	1
FI-25	2	1	1
FI-69	2	1	1
FI-124	2	1	1
AT-12-bio	1	1	1
AT-22	1	1	1
AT-45	1	1	1
DE-31S	3	1	3
DE-80S	3	1	3
DE-95N	1/2	1	1
DE-120N	1/2	1	1
DE-95N++	1/2	1	1
DE-240N	1/2	1	1
DE-650E	1/2	1	1
DE-650E++	1/2	1	1
DE-85E	1/2	1	1
DE-400E	1/2	1	1
DE-1150E	1/2	1	1
NL-76	2	1	1
NL-180	2	1	1
BE-40N	1	1	2
BE-90N	1	1	2
LU-51	2	1	1
LU-106	2	1	1
FR-39MC	2/3	1	1
FR-60C	2/3	1	1
FR-50W	2/3	1	1
FR-120W	2/3	1	1
ES-50NW	1/3	1	1
ES-69S	3/4	1	1
ES-105NW	1/3	1	1
ES-59CN	1/4	1	1
IT-154	1	1	2
IT-229	1	1	2

Farm	Data collection	Time period	Farm data quality
UK-146NW	2	4	1
UK-229SW	2	4	1
IE-48	3	1	3
IE-115	3	1	3
DK-128	2	1	1
DK-243	2	1	1
SE-139	1	1	1
SE-230	1	1	1
SE-55	1	1	1
SE-70	1	1	1
PL-15	2/3	1	1
PL-65	2/3	1	1
PL-110	2/3	1	1
CZ-80	3	1	1
CZ-425	3	1	1
CZ-730	3	1	1
RS-2	1/2	1	1
RS-84	1	1	1
UA-150	2	1	2
UA-541	2	1	2
BY-1	3	1	2
BY-1++	3	1	2
BY-608	2	1	2
BY-1095	2	1	2
RU-1063	3	1	2
RU-2443	3	1	2
AM-11SM	4	1	2N
AM-10A	4	1	2N
AM-15A	4	1	2N
IL-67	1	1	1
IL-345	1	1	1
JO-3	1	1	1
JO-30	1	1	1
JO-75	1	1	1
JO-400	1	1	1

Farm	Data collection	Time period	Farm data quality
IR-90	1	1	2N
IR-120	1	1	2N
IR-276	1	1	2N
IR-458	1	1	2N
TN-4	3/4	1	2N
TN-290	2/3	1	2N
DZ-6	1	1	1
DZ-18	1	1	1
MA-3N	3	1	1
MA-8N	3	1	1
EG-2	4	5	2
EG-4	4	5	2
EG-5	4	1	2
EG-12	4	1	2
EG-160	4	1	2
UG-1	1	1	3
UG-3	1	1	3
UG-13	1	1	3
NG-5	1	1	2
NG-50	4	1	2
CM-2	1/3	1	1
CM-10	1/3	1	1
CM-35	1/3	1	1
CM-50	1/3	1	1
ZA-210	1	1	1
ZA-422	1/2	1	1
ZA-630	1	1	1
CA-58	2/3	1	1
CA-131	2/3	1	1
US-80WI	2	1	1
US-350WI	2	1	1
US-66NY	2	1	1
US-467NY	2	1	1
US-2169NY	2	1	1
US-1000ID	2/3	3	3
US-2000ID	2/3	3	3
MX-15	1	5	2
MX-1653	1	5	2
AR-170	1/2	1	1
AR-400	1/2	1	1
AR-600	1/2	1	1

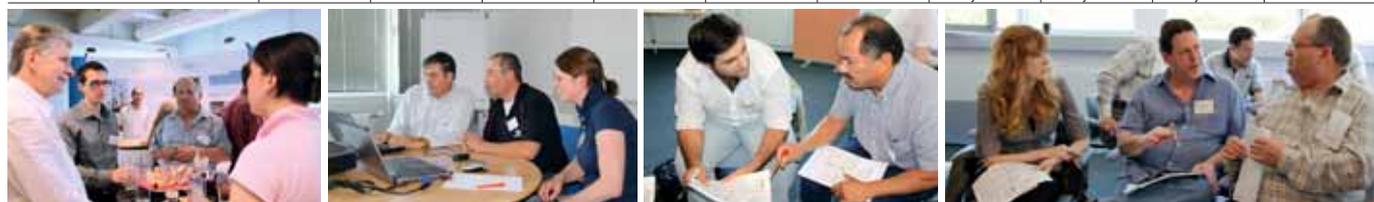
Farm	Data collection	Time period	Farm data quality
UY-119	2/3	4	1
UY-381	2/3	4	1
PY-45	4	3	3
PY-61	3	3	3
CL-47	3/1	1	1
CL-421	3/1	1	1
CL-1018	3/1	1	1
CL-100	1	1	1
CL-408++	1	1	1
BR-20S	1	1	1
BR-50S	1	1	1
BR-25SE	1	1	1
BR-100SE	1	1	1
BR-120PR	1/2/4	1	1
BR-571PR	1/2/4	1	1
PE-7	4	1	1
PE-17	4	1	1
IN-2W	2/3	5	1
IN-25	2/3	5	1
IN-2E	2/3	5	1
IN-13W	2/3	5	1
IN-18N	2/3	5	1
PK-5	1/2	1	2
PK-15	1/2	1	2
BD-2	1/2	1	1
BD-14	1/2	1	1
ID-3NG	1/3	3	3
ID-10NG	1/3	3	3
ID-3JA	1/3	3	3
ID-10JA	1/3	3	3
CN-17BE	1	1	1
CN-340BE	1	1	1
CN-5HJ	1	1	2N
CN-10HJ	1	1	2N
CN-40HJ	1	1	2N
CN-6IM	3/1	3	3
CN-150IM	3	3	3
CN-550IM	3	3	3
AU-276VI	4	3	3
AU-322VI	2	3	3
NZ-348	2	1	1
NZ-974	2	1	1

A.4 Description of the typical dairy farms analysed

Typical farm	AM-10A	AM-11SM	AM-15A	AR-170	AR-400	AR-600	AT-12-bio	AT-22	AT-45	AU-276VI
Region	Armavir	Shirak Marz	Armavir	Sta.Fé-Córdoba	Mary Sierras - Buenos Aires Province	Oeste (Trenque Lauquen)	Niederösterreich	Steiermark	Steiermark	Victoria, Gippsland
Kind of farm (as specified in the INP)	Corporate farming system	Family farm	Corporate farming system	Family farm partnership	Corporate farming system	Family farm partnership	Family farm	Family farm	Family farm	Family farm
Production system	st	ss	st	gr	gr	gr	st	fs	fs (ff)	gr
No. of cows	10	11	15	170	400	600	12	22	45	276
Breed	Caucasian brown swiss	Caucasian brown	Caucasian brown swiss	HF	HF	HF	Fleckvieh	Fleckvieh	Fleckvieh	HF
Total land (ha) ¹⁾ / proportion of land used for dairy enterprise (%)	0 (0%)	11 (0%)	3.0 (0%)	227 (76%)	485 (100%)	750 (100%)	25 (72%)	24 (90%)	45 (89%)	182 (100%)
Stocking rate per ha land ²⁾				1.1	0.9	1.0	0.8	1.3	1.6	1.5
Total labour input ³⁾ (labour unit)/ proportion of family labour input (%)	3.0 (100%)	2.9 (60%)	3.5 (66%)	4.8 (20%)	6.8 (10%)	12 (5%)	1.8 (100%)	2.1 (100%)	2.3 (100%)	2.6 (56%)
Other enterprises	Beef fattening	Cash crops, beef fattening	Beef fattening	Cash crops						

Dairy specific data										
Milk yield (kg ECM ⁴⁾ /cow/year	1,799	1,522	1,762	5,158	5,762	6,508	6,227	7,082	8,484	7,342
Milk production (t ECM ⁴ /year)	18	17	26	877	2,305	3,905	75	156	382	2,026
Replacement rate (%)	20%	18%	10%	28%	25%	26%	23%	28%	33%	23%
Age of first calving (months)	27	27	27	29	27	27	30	29	29	24

Farm background (from the year box)										
Rainfall (mm/square meter)	300	500	300	950	910	800	1,150	1,000	950	-
Altitude (m above sea level)	1,000	1,700	1,000	100	150	91	700	650	500	-
Soil type	Sandy clay	Clay	Sandy clay	-	-	Loamy sand,	Sand	Loamy sand	Sandy loam	-
Milking system	Hand milking	Hand milking	Hand milking	Parlour milking	Parlour milking	Parlour milking	Pipeline milking system	Parlour milking system	Parlour milking system	-



Typical farm	AU-322VI	BD-2	BD-14	BE-40N	BE-90N	BR-20S	BR-25SE	BR-50S	BR-100SE	BR-120PR
Region	Victoria, North	Dinajpur	Dinajpur	Belgium-Flanders	Belgium-Flanders	Santa Catarina	Minas Gerais	Rio Grande so	Minas Gerais	Paraná
Kind of farm (as specified in the INP)	Family farm	Small scale family farms	Corporate farming system	Family farm	Family farm	Household with farming activities	Household with farming activities	Family farm	Corporate farming system	Cooperative
Production system	gr	ss	ss	fs	fs	gr	ss	fl	gr (ff)	fl
No. of cows	322	2	14	40	90	20	25	50	100	120
Breed	HF	Local	Local*Shahiwal or Frisian	Zwart-bont	Zwart-bont	HF	Crossbreed (Gir x HF)	HF	HF	HF
Total land (ha) ¹⁾ / proportion of land used for dairy enterprise (%)	245 (100%)	0.5 (30%)	2.5 (40%)	45 (92%)	60 (92%)	17 (100%)	52 (100%)	54 (100%)	121 (100%)	116 (46%)
Stocking rate per ha land ²⁾	1.3			1.4	1.9	1.2	0.7	1.1	1.1	1.5
Total labour input ³⁾ (labour unit)/ proportion of family labour input (%)	3.2 (59%)	0.7 (75%)	2.3 (20%)	2.5 (100%)	2.5 (100%)	1.3 (100%)	0.9 (100%)	2.6 (67%)	3.1 (29%)	6.9 (51%)
Other enterprises		Cash crops, value of manure from dairy	Cash crops, value of manure from dairy	Cash crops, beef fattening						Cash crops
Dairy specific data										
Milk yield (kg ECM ⁴⁾ /cow/year	4,353	861	2,707	7,814	8,494	3,981	1,460	6,717	5,423	6,639
Milk production (t ECM ⁴ /year)	1,402	2	38	313	764	80	37	336	542	797
Replacement rate (%)	23%	16%	16%	33%	36%	24%	22%	23%	18%	21%
Age of first calving (months)	24	42	36	27	27	26	36	26	31	26

Farm background (from the year box)										
Rainfall (mm/square meter)	-	1,700	1,700	850	780	1,300	1,300	1,300	1,300	1,800
Altitude (m above sea level)	-	10	10	75	55	900	1,000	900	1,000	950
Soil type	-	Silty clay loam	Silty clay loam	Sandy loam	Loamy sand	Clay loam	Sandy clay	Clay loam	Sandy clay	Clay
Milking system	-	-	-	Parlour milking	Parlour milking	Vacuum bucket milking system	Vacuum bucket milking system	Pipeline milking	Pipeline milking	Parlour milking

Typical farm	BR-571PR	BY-1	BY-1++	BY-608	BY-1095	CA-58	CA-131	CH-17	CH-23	CH-64
Region	Paraná	Gomel	Gomel	All over the country	All over the country	Québec	Ontario	Mountain area	Hill area	Plain area
Kind of farm (as specified in the INP)	Cooperative	Household with farming activities	Household with farming activities	Corporate farming system	Corporate farming system	Family farm	Corporate farming system	Family farm	Family farm	Family farm
Production system	fs	ss	ss	fs	fs	fs	fs	st	st	fs
No. of cows	571	1	1	608	1,095	58	131	17	23	64
Breed	HF	Black and white	Black and white	HF	HF	HF	HF	Brown swiss	Brown swiss	Brown swiss
Total land (ha) ¹⁾ / proportion of land used for dairy enterprise (%)	360 (58%)	1.0 (71%)	1.0 (71%)	4,303 (10%)	3,581 (10%)	133 (93%)	249 (69%)	27 (81%)	26 (88%)	44 (93%)
Stocking rate per ha land ²⁾	3.3	1.4	1.4	1.3	3.0	0.6	1.2	1.0	1.2	1.9
Total labour input ³⁾ (labour unit)/ proportion of family labour input (%)	22 (14%)	1.0 (100%)	1.3 (100%)	178 (0%)	263 (0%)	1.6 (76%)	4.2 (57%)	1.9 (80%)	1.9 (75%)	2.9 (64%)
Other enterprises	Cash crops	Cash crops	Cash crops	Cash crops, beef fattening	Cash crops, beef fattening			Other livestock, other services	Other livestock, other services	Other livestock, other services
Dairy specific data										
Milk yield (kg ECM ⁴⁾ /cow/year	9,223	4,190	5,171	3,921	5,906	7,273	8,470	5,675	6,305	6,984
Milk production (t ECM ⁴ /year)	5,269	4	5	2,384	6,467	422	1,110	96	145	447
Replacement rate (%)	35%			37%	36%	36%	38%	33%	33%	33%
Age of first calving (months)	24	27	27	27	27	25	24	32	30	28

Farm background (from the year box)										
Rainfall (mm/square meter)	1,800	600	600	650	650	1,000	1,000	1,100	1,100	900
Altitude (m above sea level)	950	180	180	220	200	500	400	1,000	700	450
Soil type	Clay	Sandy loam	Sandy loam	Loam	Loam	Clay loam	Clay loam	Clay loam	Clay loam	Sandy clay loam
Milking system	Parlour milking	Hand milking	Hand milking	Pipeline milking	Pipeline milking	Parlour milking	Parlour milking	Pipeline milking	Pipeline milking	Parlour milking

Legend:

Production system: ¹⁾ incl. setaside, ²⁾ Livestock units/ ha of dairy land, ³⁾ Hired and family labour input for the whole farm (1 unit = 2,100 hours),

⁴⁾ ECM = Energy corrected milk (4% fat, 3.3% protein), HF = Holstein Friesian

Production system codes: st = Stanchion barn, fs = Free stall barn, fl = Feedlot farms, gr = Grazing farms, ss = Small scale farms, (ff) = Future farm

A.4 Description of the typical dairy farms analysed

Typical farm	CL-47	CL-100	CL-408++	CL-421	CL-1018	CM-2	CM-10	CM-35	CM-50	CN-17BE
Region	Xª Región	XIVa. Región, Río Bueno	Xa. Región, Osorno.	Xa. Región, Osorno.	Xª Región, NE of Osorno	Western Highlands	Western Highlands	Western Highlands	Western Highlands	North China
Kind of farm (as specified in the INP)	Family farm	Family farm	Family farm	Family farm	Corporate farming system	Household with farming activities	Family farm	Family farm	Family farm	Family farm
Production system	gr	gr	gr (ff)	gr	gr	ss	ss (ff)	gr	gr	fl
No. of cows	47	100	408	421	1,018	2	10	35	50	17
Breed	HF & HFxJersey cross	HF	HF	HF	Holstein + Montbeliarde	HF	Crossbreed Fulani x Holstein	Fulani	Fulani	HF
Total land (ha) ¹⁾ / proportion of land used for dairy enterprise (%)	100 (100%)	90 (100%)	288 (100%)	523 (65%)	1,260 (100%)	5.0 (18%)	30 (100%)	40 (50%)	60 (50%)	0.1 (100%)
Stocking rate per ha land ²⁾	1.1	1.4	1.9	1.0	1.1	1.9	0.2	0.9	0.9	
Total labour input ³⁾ (labour unit)/ proportion of family labour input (%)	2.4 (6%)	6.1 (17%)	18 (6%)	19 (7%)	34 (0%)	2.7 (77%)	1.7 (20%)	2.2 (44%)	2.4 (43%)	2.8 (95%)
Other enterprises				Cash crops		Cash crops		Value of manure from dairy	Beef fattening, value of manure from dairy	Beef fattening, value of manure from dairy
Dairy specific data										
Milk yield (kg ECM ⁴⁾ /cow/year)	5,411	4,946	7,025	9,369	6,340	3,332	1,844	733	718	5,021
Milk production (t ECM ⁴⁾ /year)	252	495	2,866	3,944	6,454	7	18	26	36	85
Replacement rate (%)	30%	30%	28%	25%	36%	11%	15%	18%	18%	19%
Age of first calving (months)	32	27	27	25	27	30	32	35	35	26
Farm background (from the year box)										
Rainfall (mm/square meter)	1,800	1,400	1,400	1,800	1,600	1,800	1,800	1,800	1,800	501
Altitude (m above sea level)	90	100	120	80	100	1,600	1,600	1,600	1,600	250
Soil type	Silty clay loam	Silty clay loam	Silty clay loam	Silty clay loam	Silty clay loam	Silt	Silty clay loam	Loam	Loam	Loam
Milking system	Parlour milking	Parlour milking	Parlour milking	Parlour milking	Parlour milking	Hand milking	Hand milking	Hand milking	Hand milking	Parlour milking

A.4 Description of the typical dairy farms analysed

Typical farm	DE-1150E	DK-128	DK-243	DZ-6	DZ-18	EG-2	EG-4	EG-5	EG-12	EG-160
Region	Eastern Germany	Jutland	Jutland	North East	North East	Rahmane Behera	Rahmane Behera	Rahmane Behera	Rahmane Behera	Sakha Farm, Kafer El-Sheik
Kind of farm (as specified in the INP)	Corporate farming system	Family farm	Family farm	Household with farming activities	Family farm	Household with farming activities	Government owned farm			
Production system	fs	fs	fs	ss	ss	ss	ss	ss	ss	fs
No. of cows	1,150	128	243	6	18	2	4	5	12	160
Breed	HF	HF	HF	2 Local Cows and 4 Montbéliards	Prim'Holstein	Egyptian buffaloes	HF	Egyptian buffaloes	HF	HF
Total land (ha) ¹⁾ / proportion of land used for dairy enterprise (%)	2,400 (39%)	128 (78%)	204 (79%)	2.0 (0%)	6.0 (0%)	0.8 (40%)	1.6 (40%)	0.6 (40%)	2.5 (40%)	27 (45%)
Stocking rate per ha land ²⁾	1.3	1.5	1.8						3.3	4.1
Total labour input ³⁾ (labour unit)/ proportion of family labour input (%)	52 (0%)	2.1 (59%)	3.6 (28%)	2.6 (95%)	5.0 (52%)	0.8 (0%)	0.8 (0%)	1.3 (46%)	2.5 (49%)	33 (0%)
Other enterprises	Cash crops		Cash crops	Beef fattening	Beef fattening	Beef fattening, value of manure from dairy	Beef fattening, value of manure from dairy	Beef fattening, value of manure from dairy	Cash crops, beef fattening, value of manure from dairy	Cash crops, beef fattening, value of manure from dairy

Dairy specific data										
Milk yield (kg ECM ⁴⁾ /cow/year	8,614	9,633	9,631	3,511	4,485	2,863	3,411	2,828	3,442	3,065
Milk production (t ECM ⁴ /year)	9,906	1,233	2,340	21	81	6	14	14	41	490
Replacement rate (%)	40%	41%	39%	20%	25%	10%	20%	15%	15%	40%
Age of first calving (months)	26	28	28	29	27	32	32	35	31	32
Farm background (from the year box)										
Rainfall (mm/square meter)	600	745	745	500	450	-	-	250	250	250
Altitude (m above sea level)	200	40	40	10	200	-	-	9	9	9
Soil type	Loam	Sandy clay loam	Sandy clay loam	Sandy loam	Loam	-	-	Silty clay loam	Silty clay loam	Silty clay loam
Milking system	Rotary platform	Parlour milking system	Parlour milking system	Vacuum bucket milking system	Pipeline milking	-	-	Hand milking	Vacuum bucket milking system	Automatic milking system



Moments in 2017

Typical farm	ES-50NW	ES-59CN	ES-69S	ES-105NW	FI-25	FI-69	FI-124	FR-39MC	FR-50W	FR-60C
Region	Galicia	Castilla y León	Andalucía	Ribadeo, Lugo, Galicia	Päijät-Häme (Southern Finland)	Etelä- ja Keski-Pohjanmaa	Etelä- ja Keski-Pohjanmaa	Massif Central	West	Centre
Kind of farm (as specified in the INP)	Family farm	Family farm	Family farm	Family farm	Family farm	Family farm	Family farm	Family farm	Family farm	Family farm
Production system	fs	fs	fs	fs (ff)	st	fs	fs (ff)	st	fs	fs
No. of cows	50	59	69	105	25	69	124	39	50	60
Breed	HF	HF	HF	HF	Ayrshire/HF	Ayrshire/HF	Ayrshire/HF	Montbéliarde	HF	HF
Total land (ha) ¹⁾ / proportion of land used for dairy enterprise (%)	23 (100%)	38 (100%)	90 (100%)	47 (100%)	52 (100%)	105 (100%)	130 (100%)	56 (88%)	61 (78%)	110 (51%)
Stocking rate per ha land ²⁾	2.6	1.6	0.9	2.9	0.6	0.8	1.2	0.9	1.2	1.5
Total labour input ³⁾ (labour unit)/ proportion of family labour input (%)	1.9 (100%)	1.7 (95%)	1.4 (28%)	3.5 (53%)	2.5 (99%)	3.0 (81%)	3.8 (69%)	1.7 (100%)	1.6 (100%)	2.3 (66%)
Other enterprises					Cash crops	Cash crops	Cash crops		Cash crops	Cash crops
Dairy specific data										
Milk yield (kg ECM ⁴⁾ /cow/year	9,554	9,784	8,822	9,897	8,733	8,699	9,321	6,685	7,791	8,178
Milk production (t ECM ⁴ /year)	478	577	609	1,039	222	598	1,158	261	388	492
Replacement rate (%)	28%	38%	38%	37%	30%	29%	27%	34%	41%	33%
Age of first calving (months)	24	25	25	24	26	26	26	33	30	30
Farm background (from the year box)										
Rainfall (mm/square meter)	1,020	341	400	1,020	550	550	550	1,000	1,000	700
Altitude (m above sea level)	100	700	650	100	100	100	100	1,000	100	100
Soil type	Loamy sand	Clay	Loamy sand	Loamy sand	Sandy loam	Sandy loam	Sandy loam	Sandy loam	Clay loam	Silt loam
Milking system	Parlour milking	Parlour milking	Parlour milking	Rotary platform	Pipeline milking	Parlour milking	Automatic milking system	Pipeline milking	Parlour milking	Parlour milking

Typical farm	FR-120W	ID-3JA	ID-10JA	ID-3NG	ID-10NG	IE-48	IE-115	IL-67	IL-345	IN-2E
Region	West	East Java	East Java	East Java	East Java	South	South East	All over the country	All over the country	Murshidabad
Kind of farm (as specified in the INP)	Family farm	Family farm	Family farm	Family farm	Family farm	Family farm	Family farm	Family farm	Cooperative	Household with farming activities
Production system	fs	ss	ss	ss	ss	gr	gr	fs	fs	ss
No. of cows	120	3	10	3	10	48	115	67	345	2
Breed	HF	HF	HF	HF	HF	HF	HF	HF	HF	HF
Total land (ha) ¹⁾ / proportion of land used for dairy enterprise (%)	240 (36%)	0.3 (100%)	0.8 (50%)	0.3 (100%)	0.8 (100%)	44 (59%)	83 (99%)	0.4 (100%)	2.0 (100%)	0.8 (13%)
Stocking rate per ha land ²⁾	1.9					1.9	1.5			
Total labour input ³⁾ (labour unit)/ proportion of family labour input (%)	3.2 (94%)	1.2 (100%)	3.1 (11%)	1.2 (100%)	1.7 (30%)	2.1 (93%)	3.2 (93%)	2.7 (56%)	9.5 (0%)	3.7 (24%)
Other enterprises	Cash crops						Beef fattening			Cash crops, value of manure from dairy
Dairy specific data										
Milk yield (kg ECM ⁴⁾ /cow/year	8,542	2,707	5,021	2,475	2,688	7,129	6,916	10,521	11,339	3,804
Milk production (t ECM ⁴ /year)	1,026	8	50	7	27	342	795	705	3,912	8
Replacement rate (%)	38%	15%	12%	15%	12%	20%	21%	32%	28%	35%
Age of first calving (months)	30	35	32	35	32	25	25	25	25	30
Farm background (from the year box)										
Rainfall (mm/square meter)	600	-	-	-	-	-	-	600	600	1,364
Altitude (m above sea level)	100	-	-	-	-	-	-	200	200	310
Soil type	Clay loam	-	-	-	-	-	-	-	-	Loam
Milking system	Automatic milking system	Hand milking	Hand milking	Hand milking	Hand milking	-	-	Parlour milking	Parlour milking	Hand milking

Legend:

Production system: ¹⁾ incl. setaside, ²⁾ Livestock units/ ha of dairy land, ³⁾ Hired and family labour input for the whole farm (1 unit = 2,100 hours),

⁴⁾ ECM = Energy corrected milk (4% fat, 3.3% protein), HF = Holstein Friesian

Production system codes: st = Stanchion barn, fs = Free stall barn, fl = Feedlot farms, gr = Grazing farms, ss = Small scale farms, (ff) = Future farm

A.4 Description of the typical dairy farms analysed

Typical farm	IN-2S	IN-2W	IN-13W	IN-18N	IR-90	IR-120	IR-276	IR-458	IT-154	IT-229
Region	Southern region, Karnataka	Western region, Gujarat	Western region, Gujarat	Gurej, West ludhiana, Punjab	Karaj, Iran	Karaj, Iran	Esfahan /North Broan	Esfahan /Flavarjan	Lombardia	Lombardia
Kind of farm (as specified in the INP)	Household with farming activities	Household with farming activities	Household with farming activities	Family farm	Family farm	Family farm	Corporate farming system	Corporate farming system	Family farm	Family farm
Production system	ss	ss	ss	ss	fs	fs	fs	fs	fs	fs
No. of cows	2	2	13	18	90	120	276	458	154	229
Breed	HF	HF	HF Cross mehsani	HF	HF	HF	HF	HF	HF	HF
Total land (ha) ¹⁾ / proportion of land used for dairy enterprise (%)	0.0 (0%)	0.8 (31%)	3.9 (39%)	2.6 (0%)	1.0 (0%)	2.0 (0%)	340 (0%)	334 (0%)	72 (100%)	130 (100%)
Stocking rate per ha land ²⁾									2.2	1.9
Total labour input ³⁾ (labour unit)/ proportion of family labour input (%)	1.3 (100%)	1.4 (100%)	4.0 (43%)	4.4 (61%)	10 (29%)	1.4 (100%)	27 (0%)	40 (0%)	4.3 (56%)	4.9 (61%)
Other enterprises	Value of manure from dairy	Cash crops, value of manure from dairy	Cash crops, value of manure from dairy	Cash crops, value of manure from dairy	Value of manure from dairy, other returns from dairy	Cash crops, value of manure from dairy	Value of manure from dairy	Cash crops, value of manure from dairy, other returns from dairy		
Dairy specific data										
Milk yield (kg ECM ⁴⁾ /cow/year	3,400	3,599	2,640	4,938	7,838	8,418	8,835	7,918	8,857	9,068
Milk production (t ECM ⁴⁾ /year	7	7	34	89	705	1,010	2,439	3,626	1,364	2,077
Replacement rate (%)	37%	14%	15%	27%	16%	7%	21%	24%	28%	28%
Age of first calving (months)	30	36	30	24	25	25	25	25	27	27
Farm background (from the year box)										
Rainfall (mm/square meter)	768	867	867	752	355	355	400	400	750	750
Altitude (m above sea level)	949	300	300	350	1,590	1,590	1,198	1,198	45	45
Soil type	Clay loam	Silt loam	Silt loam	Silty clay loam	Silty clay	Silty clay	Sandy clay loam	Sandy clay loam	Clay loam	Clay loam
Milking system	Hand milking	Hand milking	Hand milking	Vacuum bucket milking system	Parlour milking	Parlour milking	Parlour milking	Parlour milking	Parlour milking	Parlour milking
Typical farm	JO-3	JO-30	JO-75	JO-400	LU-51	LU-106	MA-3N	MA-8N	MX-15	MX-1653
Region	Jordan valley	Madaba	Al-Dhuleel	Al-Dhuleel	All over the country	All over the country	Tadla	Tadla	Delicias chihuahua Mexico	Delicias chihuahua Mexico
Kind of farm (as specified in the INP)	Household with farming activities	Family farm	Family farm	Family farm	Family farm	Family farm	Household with farming activities	Household with farming activities	Family farm	Family farm
Production system	ss	fl	fl	fl	fs	fs	ss	ss	fs	fs
No. of cows	3	30	75	400	51	106	3	8	15	1,653
Breed	HF	HF	HF	HF	HF	HF	HF	HF	HF	HF
Total land (ha) ¹⁾ / proportion of land used for dairy enterprise (%)	0.1 (100%)	0.3 (100%)	5.0 (100%)	9.0 (100%)	99 (53%)	171 (60%)	2.5 (0%)	16 (0%)	25 (0%)	25 (0%)
Stocking rate per ha land ²⁾					1.1	1.2				
Total labour input ³⁾ (labour unit)/ proportion of family labour input (%)	1.0 (100%)	1.9 (100%)	5.4 (21%)	15 (6%)	1.8 (88%)	2.5 (84%)	1.2 (71%)	3.6 (37%)	1.1 (100%)	132 (0%)
Other enterprises					Cash crops, beef fattening	Cash crops, beef fattening		Cash crops		
Dairy specific data										
Milk yield (kg ECM ⁴⁾ /cow/year	3,615	5,789	6,358	7,236	7,553	8,678	3,667	4,000	5,183	11,160
Milk production (t ECM ⁴⁾ /year	11	174	477	2,894	383	922	11	32	78	18,447
Replacement rate (%)	20%	20%	21%	38%	35%	34%	24%	24%	22%	37%
Age of first calving (months)	28	27	27	26	31	31	30	30	26	23
Farm background (from the year box)										
Rainfall (mm/square meter)	150	250	150	150	782	782	326	326	350	350
Altitude (m above sea level)	-350	700	600	600	300	300	400	401	1,350	1,350
Soil type	-	-	-	-	-	-	-	-	-	-
Milking system	Hand milking	Pipeline system	Parlour milking	Parlour milking	Parlour milking	Parlour milking	Vacuum bucket milking system	Vacuum bucket milking system	Hand milking	Hand milking



Legend:

Production system: ¹⁾ incl. setaside, ²⁾ Livestock units/ ha of dairy land, ³⁾ Hired and family labour input for the whole farm (1 unit = 2,100 hours),

⁴⁾ ECM = Energy corrected milk (4% fat, 3.3 % protein), HF = Holstein Friesian

Production system codes: st = Stanchion barn, fs = Free stall barn, fl = Feedlot farms, gr = Grazing farms, ss = Small scale farms, (ff) = Future farm

A.4 Description of the typical dairy farms analysed

Typical farm	NG-5	NG-50	NL-76	NL-180	NO-20	NO-36	NZ-348	NZ-974	PE-7	PE-17
Region	Abuja	Kaduna	All over the country	All over the country	Nord-Østerdalen	Jæren	Waikato	Canterbury	Polloc, Cajamarca	La Campiña, Cajamarca
Kind of farm (as specified in the INP)	Household with farming activities	Corporate farming system	Family farm	Family farm	Family farm	Family farm	Family farm	Family farm partnership	Family farm	Corporate farming system
Production system	ss (ff)	fl	fs	fs	st	st	gr	gr	ss	gr
No. of cows	5	50	76	180	20	36	348	974	7	17
Breed	Friesian x Bunaji crosses	Friesian x Bunaji Crosses Mainly	HF	HF	Norwegian red	Norwegian red	Cross-bred	Cross-bred	Brown swiss	HF
Total land (ha) ¹⁾ / proportion of land used for dairy enterprise (%)	0.4 (0%)	8.0 (0%)	44 (100%)	110 (100%)	26 (79%)	30 (79%)	129 (100%)	373 (100%)	16 (83%)	7.3 (100%)
Stocking rate per ha land ²⁾			2.1	2.0	1.0	1.8	2.7	2.6	0.6	2.8
Total labour input ³⁾ (labour unit) / proportion of family labour input (%)	2.3 (100%)	15 (6%)	1.3 (92%)	2.2 (80%)	1.7 (89%)	1.7 (77%)	2.5 (48%)	5.2 (13%)	1.9 (100%)	3.7 (29%)
Other enterprises	Cash crops, beef fattening	Beef fattening			Markets returns bulls, machinery hired out	Beef fattening, other farm income				
Dairy specific data										
Milk yield (kg ECM ⁴⁾ /cow/year	2,472	3,454	8,388	8,265	7,838	6,705	5,854	5,854	2,480	5,614
Milk production (t ECM ⁴)/year	12	173	637	1,488	157	241	2,037	5,702	17	95
Replacement rate (%)	20%	35%	34%	30%	42%	45%	26%	27%	22%	19%
Age of first calving (months)	33	36	24	25	24	25	24	24	32	27
Farm background (from the year box)										
Rainfall (mm/square meter)	1,450	1,016	850	850	480	1,400	1,250	648	790	720
Altitude (m above sea level)	-	-	5	5	500	40	111	64	3,000	2,720
Soil type	Silty clay loam	Silt loam	Sand	Clay	Silt loam	Loamy sand	Silt loam	Silt loam	Loam	Loam
Milking system	-	-	Parlour milking	Parlour milking	Pipeline milking	Pipeline milking	Parlour milking	Rotary platform	Hand milking	Pipeline milking
Typical farm	PK-5	PK-15	PL-15	PL-65	PL-110	PY-45	PY-61	RS-2	RS-10	RS-84
Region	Central punjab	Lahore, Punjab	Mazowieckie	Śląsk	Śląsk/powiat raciborski	Chaco	Chaco	Central Serbia	Province of vojvodina	Province of vojvodina
Kind of farm (as specified in the INP)	Household with farming activities	Household with farming activities	Family farm	Family farm	Family farm	Family farm	Family farm	Household with farming activities	Family farm	Family farm
Production system	ss	ss	st	fs	fs (ff)	gr	gr	st	st	fs
No. of cows	5	15	15	65	110	45	61	2	10	84
Breed	Nili ravi buffaloes	Nili ravi, cross breed HF	HF+local breed	HF	HF	HF	HF	Simmentaler dominantly	5 cows Holstein, 5 cows simmentaler	Holstein 60% and Simmentaler 40%
Total land (ha) ¹⁾ / proportion of land used for dairy enterprise (%)	4.9 (85%)	18 (85%)	32 (80%)	100 (89%)	98 (100%)	72 (100%)	100 (100%)	2.0 (50%)	15 (69%)	240 (40%)
Stocking rate per ha land ²⁾	1.9	3.1	1.1	0.8	1.3	0.5	0.6	1.2	1.2	1.1
Total labour input ³⁾ (labour unit) / proportion of family labour input (%)	4.0 (74%)	3.5 (35%)	2.5 (100%)	5.2 (47%)	4.7 (53%)	1.9 (100%)	4.1 (49%)	0.4 (100%)	1.9 (100%)	5.1 (47%)
Other enterprises	Cash crops, beef fattening, value of manure from dairy	Cash crops, beef fattening, value of manure from dairy		Cash crops				Cash crops, beef fattening, value of manure from dairy	Cash crops, value of manure from dairy	Cash crops, value of manure from dairy
Dairy specific data										
Milk yield (kg ECM ⁴⁾ /cow/year	2,611	722	6,414	8,226	8,683	3,865	5,531	2,491	5,520	6,196
Milk production (t ECM ⁴)/year	13	11	96	535	955	174	337	5	55	520
Replacement rate (%)	4%	27%	34%	34%	34%	22%	20%	15%	33%	30%
Age of first calving (months)	30	30	26	27	26	29	29	24	24	24
Farm background (from the year box)										
Rainfall (mm/square meter)	220	793	600	900	900	-	-	880	980	980
Altitude (m above sea level)	180	209	170	300	300	-	-	800	120	120
Soil type	Clay loam	Clay loam	Sandy loam	Sandy loam	Sandy loam	-	-	-	-	-
Milking system	Hand milking	Hand milking	Parlour milking	Parlour milking	Parlour milking	-	-	Hand milking	Vacuum bucket milking system	Parlour milking



Legend:

Production system: ¹⁾ incl. setaside, ²⁾ Livestock units/ ha of dairy land, ³⁾ Hired and family labour input for the whole farm (1 unit = 2,100 hours),

⁴⁾ ECM = Energy corrected milk (4% fat, 3.3% protein), HF = Holstein Friesian

Production system codes: st = Stanchion barn, fs = Free stall barn, fl = Feedlot farms, gr = Grazing farms, ss = Small scale farms, (ff) = Future farm

A.4 Description of the typical dairy farms analysed

Typical farm	RU-1063	RU-2443	SE-55	SE-70	SE-139	SE-230	TN-4	TN-290	UA-150	UA-541
Region	Krasnodar region	Krasnodar region	Säter Dalarna	Luleå Kustområdet Norrmjöjerier	Skåne, Hörby	Falkenberg, Halland	North	North West	Chernihivska oblast	Sumska oblast
Kind of farm (as specified in the INP)	Corporate farming system	Corporate farming system	Family farm	Family farm	Family farm	Corporate farming system	Family farm	Government owned farm	Corporate farming system	Corporate farming system
Production system	fs	fs	st	fs	fs	fs	ss	fs	fs	fs
No. of cows	1,063	2,443	55	70	138	230	4	290	150	541
Breed	Ayrshire holstein	Ayrshire holstein	Swedish red	Mixed Swedish red and black holstein	HF	HF	HF	HF	Ukrainian red and white	Ukrainian red and white
Total land (ha) ¹⁾ / proportion of land used for dairy enterprise (%)	8,009 (15%)	8,754 (40%)	170 (74%)	120 (100%)	180 (70%)	215 (100%)	4	2,750	1,150 (13%)	3,864 (14%)
Stocking rate per ha land ²⁾	0.7	0.6	0.6	0.8	1.5	1.5			0.9	1.2
Total labour input ³⁾ (labour unit)/ proportion of family labour input (%)	401 (0%)	584 (0%)	2.4 (54%)	2.3 (75%)	2.7 (36%)	5.2 (31%)	0.7 (100%)	141 (0%)	89 (0%)	243 (0%)
Other enterprises	Beef fattening, other returns from dairy	Beef fattening, other returns from dairy	Cash crops		Cash crops			Cash crops	Cash crops	Cash crops, pigs

Dairy specific data										
Milk yield (kg ECM ⁴⁾ /cow/year	5,638	6,541	9,798	10,230	9,956	10,090	3,178	5,772	3,621	4,109
Milk production (t ECM ⁴⁾ /year	5,993	15,980	539	716	1,374	2,321	13	1,674	543	2,223
Replacement rate (%)	37%	37%	45%	45%	45%	38%	10%	30%	35%	29%
Age of first calving (months)	24	24	26	26	27	26	28	29	29	29

Farm background (from the year box)										
Rainfall (mm/square meter)	800	800	650	550	650	950	450	400	650	650
Altitude (m above sea level)	200	200	150	50	150	50	428	148	200	200
Soil type	Loam	Loam	Silt loam	Silt loam	Moraine	Sandy clay loam	Sandy clay	Clay loam	Sandy clay loam	Sandy clay loam
Milking system	Rotary platform	Rotary platform	Pipeline milking	Automatic milking system	Automatic milking system	Parlour milking	Hand milking	Parlour milking	Parlour milking	Parlour milking



Typical farm	UG-1	UG-3	UG-13	UK-146NW	UK-229SW	US-1000ID	US-2000ID	US-80WI	US-350WI	US-66NY
Region	Mukono district	Kayunga district	Kayunga district	North West	South West	Idaho	Idaho	Wisconsin	Wisconsin	Northeast US
Kind of farm (as specified in the INP)	Family farm	Family farm	Family farm	Family farm	Family farm	Corporate farming system	Corporate farming system	Family farm	Family farm partnership	Family farm
Production system	ss (ff)	gr	gr	fs	fs	fl	fl	st	fs	st
No. of cows	1	3	13	146	229	1,000	2,000	80	350	66
Breed	HF	Local Ankole	Local Ankole	HF	HF	HF	HF	HF	HF	HF
Total land (ha) ¹⁾ / proportion of land used for dairy enterprise (%)	1.1 (27%)	1.6 (25%)	5.5 (50%)	140 (85%)	191 (85%)	390	220	75 (95%)	275 (98%)	161 (99%)
Stocking rate per ha land ²⁾				1.3	1.6			1.0	1.2	0.5
Total labour input ³⁾ (labour unit)/ proportion of family labour input (%)	0.8 (88%)	1.6 (67%)	3.1 (50%)	2.4 (50%)	4.5 (53%)	25 (9%)	37 (0%)	3.0 (79%)	9.6 (40%)	2.8 (60%)
Other enterprises				Cash crops, beef fattening	Cash crops, beef fattening					Cash crops, other returns from dairy

Dairy specific data										
Milk yield (kg ECM ⁴⁾ /cow/year	3,237	728	456	7,924	7,553	9,528	9,846	9,246	10,597	8,757
Milk production (t ECM ⁴⁾ /year	3	2	6	1,157	1,730	9,528	19,691	740	3,709	578
Replacement rate (%)	46%	31%	25%	23%	19%	35%	35%	30%	35%	34%
Age of first calving (months)	27	39	39	27	27	24	24	26	26	25

Farm background (from the year box)										
Rainfall (mm/square meter)	-	-	-	1,200	950	-	-	860	860	880
Altitude (m above sea level)	-	-	-	1	1	-	-	320	320	100
Soil type	-	-	-	Sandy clay loam	Clay	-	-	Silt loam	Silt loam	Sandy clay loam
Milking system	Hand milking	Hand milking	Hand milking	Parlour milking	Parlour milking	-	-	Pipeline milking	Parlour milking	Pipeline milking

Typical farm	US-467NY	US-2169NY	UY-119	UY-381	ZA-210	ZA-422	ZA-630
Region	Northeast US	Northeast US	South	South	Free-Sate	Kwazulu natal	Gauteng/western-Cape
Kind of farm (as specified in the INP)	Family farm partnership	Corporate farming system	Family farm partnership	Family farm partnership	Corporate farming system	Corporate farming system	Corporate farming system
Production system	fs	fs	gr	gr	fl	gr	fs (ff)
No. of cows	467	2,169	119	381	210	447	630
Breed	HF	HF	HF	HF	HF	HF	HF
Total land (ha) ¹⁾ / proportion of land used for dairy enterprise (%)	728 (99%)	1,866 (100%)	202 (95%)	590 (95%)	397 (95%)	258 (92%)	570 (88%)
Stocking rate per ha land ²⁾	0.8	1.4	0.7	0.7	0.7	2.5	1.6
Total labour input ³⁾ (labour unit)/ proportion of family labour input (%)	14 (20%)	53 (10%)	3.9 (36%)	8.9 (11%)	5.2 (18%)	23 (4%)	14 (6%)
Other enterprises	Cash crops, other returns from dairy	Cash crops, other returns from dairy					

Dairy specific data							
Milk yield (kg ECM ⁴⁾ /cow/year	10,233	10,630	5,499	6,114	6,115	5,886	10,965
Milk production (t ECM ⁴⁾ /year	4,779	23,056	654	2,329	1,284	2,631	6,908
Replacement rate (%)	32%	35%	22%	22%	30%	30%	32%
Age of first calving (months)	24	23	28	28	30	30	30

Farm background (from the year box)							
Rainfall (mm/square meter)	880	880	1,000	1,000	450	650	500
Altitude (m above sea level)	50	70	200	200	1,400	1,000	1,500
Soil type	Sandy clay loam	Sandy clay loam	Silty clay loam	Silty clay loam	Sandy clay loam	Sandy clay	Sandy loam
Milking system	Parlour milking	Parlour milking	Parlour milking	Parlour milking	Pipeline milking	Rotary platform	Rotary platform



Legend:

Production system: ¹⁾ incl. setaside, ²⁾ Livestock units/ ha of dairy land, ³⁾ Hired and family labour input for the whole farm (1 unit = 2,100 hours),

⁴⁾ ECM = Energy corrected milk (4% fat, 3.3% protein), HF = Holstein Friesian

Production system codes: st = Stanchion barn, fs = Free stall barn, fl = Feedlot farms, gr = Grazing farms, ss = Small scale farms, (ff) = Future farm

A.5 Farm description of additional farms (not in Chapter 1)

1. Typical farm description	CN-7	CN-100	CO-30	CO-100	NP-2	NP-4	SA-12000	SA-40000	TR-10	TR-24
No. of cows	7	100	30	100	2	4	12,000	40,000	10	24
Breed	HF	HF	HF	HF	Local	Local	HF	HF	HF	HF
Milk yield (kg/cow/year) ¹	4,800	7,500	4,800	6,000	1,020	1,041	10,500	11,000	6,000	6,900
Lactation period (days)	280	305	305	305	240	240	340	320	325	300
Total farmland (ha) ²	2	150	16	50	-	-	500	1,200	9	15
Proportion of land used for dairy (%)	0%	90%	90%	85%	-	-	60%	70%	0%	0%
Total labour input (labour unit) ³	1.33	0.14	2.35	7.04	1.36	1.36	95.48	209.52	0.87	1.04
Family labour input (% of total labour)	100%	100%	0%	0%	100%	100%	0%	0%	100%	100%
Farm buildings/type of stable	Wood barn	Brick	-	Freestall barn	Bamboo poles, straw	Bamboo poles, straw	Shaded barns, youngstock housing, maternity housing	Shaded barns with coral cooler, youngstock barns, maternity and hospital housing	-	-
Farm machinery	Small tools, motor bike	Tractor, silage harvester		Tractor	Sickle, plough, small hand tools, small tractors		Feeding wagons (towed or compacted), loaders, tractors, tractors,	Feeding wagons, loaders, tractors, stationary mixing machines	Tractor, milking machine, agricultural tools	Tractor, milking machine, agricultural tools
Milking system	Vacuum bucket	Parlour	Pipeline	Parlour	Hand	Hand	Automatic	Automatic	Vacuum bucket	Vacuum bucket
Proportion of milk produced from this farm type	60%	40%	15%	33%	-	-	4%	13%	65%	35%
Farmer sells milk to...	Milk collection station	Dairy processor enterprises	Cooperative	Processor	Cooperative	Cooperative	Directly to end consumers	Directly to end consumers	Private dairy	Cooperative
Legal form of farm	Family farm (labour input mainly from the family)	Cooperative	Corporate farming system (work mainly done by employees)	Corporate farming system (work mainly done by employees)	Family farm (labour input mainly from the family)	Family farm (labour input mainly from the family)	Corporate farming system (work mainly done by employees)	Cooperative	Family farm (labour input mainly from the family)	Family farm (labour input mainly from the family)
2. Feeding system	Home grown feed	Concentrate based feed	The cows are in the grass all over the year	The cows are in the grass all over the year	Mostly stall fed, home produced concentrate + grass and fodder	Mostly stall fed, home produced concentrate + grass and fodder	TMR	TMR	Pasture at spring, roughage generally	All year round at stable, based on concentrate
3. Perspectives of dairy farming										
Motives for dairy farming	Improvement of living standards, economic incentives, and self employment.	Profit maximization	Investment for future	Good market opportunities and investment for future	Economic incentives		Profit maximization and economic incentives	Profit maximization, economic incentives and improvement of living standard	Economic incentives, improvement in living standards, self employment, feed the family (subsistence) and socio-economic reasons (dairy passion, tradition)	Economic incentives, improvement in living standards, self employment, and socio-economic reasons (dairy passion, tradition)
Perspectives of farmer	Decrease production	Grow	Remain stable	Grow			Grow	Remain stable	Grow / remain stable	Grow
Perspectives of dairy farming (subsidies, quotas, constraints)	Constraints	Subsidies	Revaluation of Colombian \$ Peso	Revaluation of Colombian \$ Peso	Better milk price, secure marketing, less milk holiday				Opportunities: subsidies, low interest credits; Constraints: prices (feed, milk), sale of heifers	Opportunities: subsidies, low interest credits; Constraints: prices (feed, milk), sale of heifers



Typical farm description	BG - 2	BG - 34	KZ - 1113	KZ - 1113++	UZ - 402	UZ - 529	IS - 40	IS - 63	VN - 3	VN - 5
Herd size	2	34	1,113	1,113	402	529	40	63	3	5
Breed	HF	HF			-	-	Iceland cattle	Iceland cattle	HF and HF crossbreed	HF and HF crossbreed
Milk yield (kg/cow/year)	4,800	5,611	3,000	3,500	2,700	2,548	5,258	5,960	4,050	3,910
Lactation period (days)	358	358	358	358	245	245	358	358	310	310
Total farmland (ha)	16	40	5,116	5,116	165	230	305	379	0	1
Proportion of land used for dairy (%)	22%	100%	10%	10%			100%	71%	70%	65%
Total labour input (labour unit)	0.77	1.78	1.00	1.00	1.67	1.67	2.29	2.48	2.09	3.15
Family labour input (% of total labour)	93%	48%	0%	0%	50%	50%	83%	77%	100%	99%
Legal form of farm	Household with farming activities	Household with farming activities	Corporate farming system (work mainly done by employees)	Corporate farming system (work mainly done by employees)	Corporate farming system (work mainly done by employees)	Corporate farming system (work mainly done by employees)	Family farm (labour input mainly from the family)	Family farm (labour input mainly from the family)	Household with farming activities	Household with farming activities

Explanations:

1) Milk yield in kg (natural content), 2) incl. setaside, 3) Hired and family labour input for the whole farm (1 unit = 2100 hours)

HF = Holstein Friesian, TMR = Total Mixed Ration

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A.7 Assumptions for the calculations

Cost calculation

The cost calculations are based on dairy enterprises that consist of the following elements:

- milk production
- raising of replacement heifers
- forage production

The analysis results in a comparison of returns and total costs per kilogram of milk. Total costs consist of expenses from the profit and loss account (cash costs, depreciation, etc.), and opportunity costs for farm-owned factors of production (family labour, own land, own capital). The estimation of these opportunity costs must be considered carefully because the potential income of farm owned factors of production in alternative uses is difficult to determine. In the short run, the use of own production factors on a family farm can provide flexibility in the case of low returns when the family can choose to forgo income. However, in the long run opportunity costs must be considered because the potential successors of the farmer will, in most cases, make a decision on the alternative use of own production factors, in particular their own labour input, before taking over the farm. To indicate the effects of opportunity costs we have separated them from the other costs in most of the figures.

For the estimations and calculations the following assumptions were made:

Labour costs

For hired labour, cash labour cost currently incurred was used. For unpaid family labour, the wage rate per hour for a qualified full-time worker in the region multiplied with the working time of a skilled worker was used. In some cases, mainly in developing countries, we used the approach of individual opportunity wage levels for family members multiplied with their working time in the farm.

Land costs

For rented land, rents currently paid by the farmers were used. Regional rent prices provided by the farmers were used for owned land. In those countries with limited rental markets (like NZ), the land market value was capitalised at 3.5 % annual interest to obtain a theoretical rent price.

Capital costs

Capital is defined as assets, without land and quota (calculation: assets for buildings, machinery, livestock and other), plus circulating capital (10% of all dairy related variable expenses). For borrowed funds, a real interest rate of 6% was used in all countries; for owner's capital, the real interest rate was assumed to be 3%.

Quota costs

Rent values were used for rented or leased quota. Opportunity costs for own quota are calculated based on the quota value * 3% interest rate. Depreciation of quota based on national depreciation scheme is deducted to calculate farm income.

Depreciation

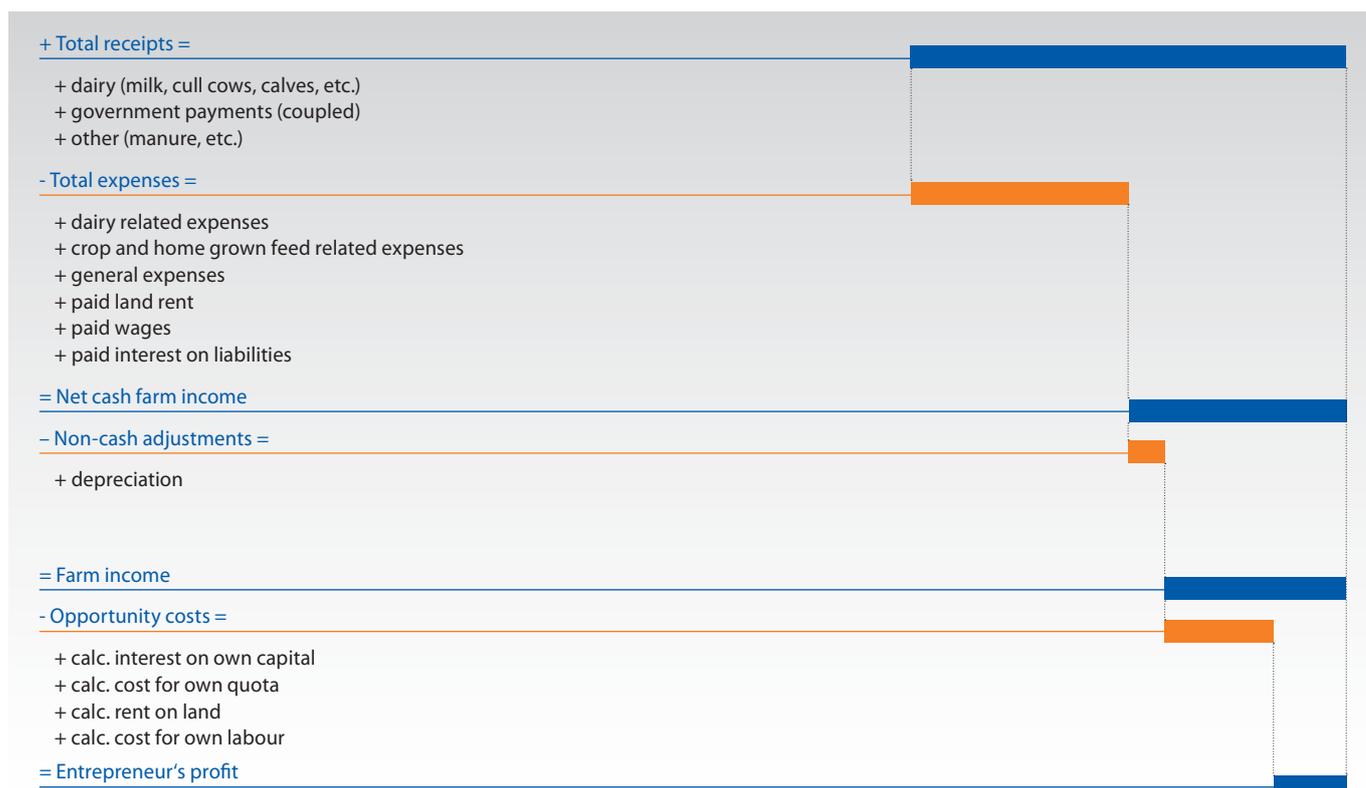
For the bookkeeping value and depreciation of machinery and buildings the figures calculated by country partners were used. In small farms in countries without a bookkeeping system, estimates were made based on the asset value and machinery list of the farm.

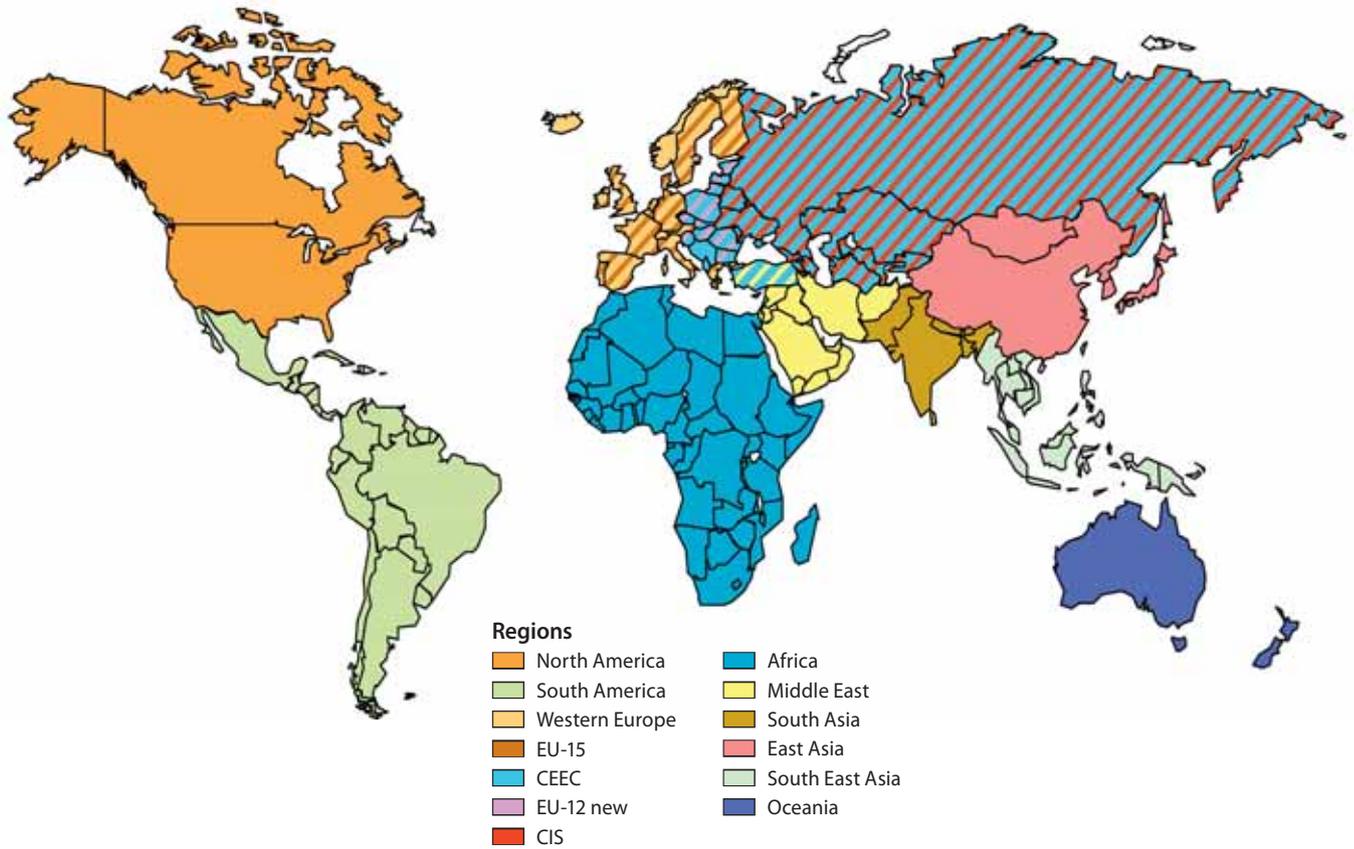
Adjustment of VAT

All cost components and returns are stated without value added tax (VAT).

Adjustment of milk ECM

The milk output per farm is adjusted to 4 % fat, 3.3 % protein. Formula: $ECM\ milk = (milk\ production * (0.383 * \% fat + 0.242 * \% protein + 0.7832) / 3.1138)$. Source: DLG (2001), unpublished





Source: Specification done by IFCN Dairy Research Center, Kiel, to group countries into meaningful aggregates. In some cases the aggregation does not follow the official geopolitical specification of world regions.

Special cases: CEEC: includes all former Soviet Union countries. South America: includes all Latin American countries.

Impression of finishing a PhD



A.9 Exchange rates 1996-2010

Country	Currency	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Afghanistan	AFN	4,750	4,750	4,750	4,711	4,837	4,750	4,726	56	43	43	49	50	50	51	47
Albania	ALL	101.56	147.71	152.44	138.64	144.82	145.87	145.44	126.34	106.80	102.93	102.91	92.57	85.62	96.68	105.88
Algeria	DZD	54.75	57.72	58.72	66.58	76.83	78.96	82.02	79.81	74.15	74.39	75.18	70.25	65.84	74.15	75.45
Argentina	ARS	1.00	1.00	1.00	1.00	1.00	1.00	3.11	2.99	2.96	2.93	3.09	3.13	3.17	3.74	3.92
Armenia	AMD	414.0	490.7	504.96	535.20	539.50	555.10	573.40	578.80	533.50	457.70	423.98	339.50	305.95	363.14	373.76
Australia	AUD	1.28	1.35	1.59	1.55	1.73	1.93	1.84	1.54	1.36	1.31	1.33	1.19	1.19	1.28	1.09
Azerbaijan	AZN	4,300	3,984	3,869	4,120	4,475	4,655	4,860	4,910	4,915	4,730	0.92	0.90	0.82	0.80	0.80
Bangladesh	BDT	41.90	44.01	47.05	49.19	52.34	56.77	59.63	60.06	60.88	64.65	70.29	70.33	69.79	70.14	70.82
Belarus	BYR	13,608	25,039	43,569	276,661	800	1,420	1,804	2,051	2,160	2,150	2,152	2,152	2,152	2,793	2,997
Bolivia	BOB	5.09	5.26	5.52	5.79	6.12	6.52	6.89	7.43	7.63	8.16	8.27	8.05	7.37	7.16	7.16
Brazil	BRL	1.00	1.08	1.16	1.82	1.83	2.38	2.97	3.12	2.93	2.43	2.18	1.93	1.84	2.01	1.77
Bulgaria	BGN	179.45	1,645.66	1,753.92	2.18	2.18	2.18	2.07	1.73	1.58	1.57	1.57	1.43	1.34	1.41	1.48
Cameroon	XAF	512.49	584.26	590.21	616.02	713.46	741.47	724.61	590.97	549.16	532.75	539.56	492.72	457.07	481.08	504.92
Canada	CAD	1.36	1.38	1.48	1.49	1.49	1.55	1.57	1.40	1.30	1.21	1.13	1.07	1.06	1.14	1.03
Chile	CLP	412.37	419.51	460.67	509.19	539.67	642.62	703.77	702.97	621.67	561.81	539.39	520.69	521.97	570.54	519.48
China	CNY	8.31	8.29	8.28	8.28	8.28	8.28	8.29	8.29	8.29	8.29	8.29	7.98	7.60	6.94	6.78
Colombia	COP	1,036	1,143	1,428	1,762	2,093	2,324	2,580	2,938	2,676	2,332	2,424	2,104	1,987	2,181	1,922
Croatia	HRK	5.44	6.17	6.40	7.14	8.30	8.40	8.10	6.97	6.28	5.98	5.84	5.37	4.94	5.30	5.51
Czech Republic	CZK	27.14	31.75	32.27	34.63	38.64	38.04	32.81	28.23	25.73	23.99	22.63	20.23	17.06	19.11	19.12
Denmark	DKK	5.80	6.60	6.70	6.98	8.09	8.32	7.88	6.58	5.99	6.00	5.94	5.42	5.08	5.36	5.62
Ecuador	USD	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Egypt	EGP	3.41	3.40	3.42	3.42	3.55	4.06	4.66	5.91	6.24	5.83	5.82	5.71	5.50	5.60	5.68
Estonia	EEK	11.90	13.87	14.08	14.69	17.01	17.47	16.60	13.86	12.60	12.59	12.48	11.40	10.71	11.30	11.83
Ethiopia	ETB	5.84	6.50	6.99	7.81	8.08	8.42	8.79	8.79	8.89	8.83	9.02	9.22	10.71	11.86	14.62
Euro	EUR	0.77	0.87	0.90	0.94	1.09	1.12	1.06	0.89	0.81	0.80	0.80	0.73	0.68	0.72	0.75
Hungary	HUF	149.45	186.85	214.49	237.40	282.89	286.59	258.08	224.50	202.93	199.94	210.83	184.02	172.80	202.63	208.22
Iceland	ISK	66.80	71.10	71.20	72.40	78.90	97.69	91.67	76.78	70.26	62.92	70.10	63.66	88.55	125.04	124.87
India	INR	35.44	36.34	41.29	43.06	44.95	47.23	48.68	46.66	45.34	44.12	45.32	41.08	43.80	48.86	45.94
Indonesia	IDR	2,328	2,904	10,285	7,877	8,416	10,294	9,350	8,593	8,946	9,722	9,184	9,139	9,685	10,437	9,125
Iran	IRR	1,585	2,399	3,297	4,195	5,094	5,992	6,890	7,900	7,900	8,283	9,492	9,524	9,641	10,050	10,205
Israel	ILS	3.19	3.45	3.81	4.15	4.09	4.21	4.74	4.55	4.49	4.50	4.47	4.10	3.60	3.93	3.74
Jamaica	JMD	36.09	34.39	36.02	38.57	42.55	45.60	47.72	53.48	57.41	66.35	65.76	69.53	74.32	89.92	88.17
Japan	JPY	108.83	121.04	130.88	113.81	107.86	121.56	125.30	115.98	108.17	110.12	116.34	117.58	103.40	93.57	87.85
Jordan	JOD	0.71	0.71	0.71	0.71	0.71	0.72	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Kazakhstan	KZT	67.87	75.63	78.64	119.83	142.31	147.55	150.77	151.91	140.81	134.17	130.59	125.41	122.38	149.63	149.46
Kenya	KES	57.17	58.92	60.54	70.42	76.28	78.75	79.15	76.32	79.55	75.75	72.62	67.82	71.46	79.96	82.24
Korea	KRW	805	954	1,402	1,190	1,131	1,291	1,250	1,195	1,151	1,028	970	935	1,103	1,280	1,160
Kyrgyzstan	KGS	12.80	17.36	20.77	39.02	47.72	48.45	46.94	43.72	42.67	41.01	41.44	39.96	36.57	42.96	45.98
Latvia	LVL	0.55	0.58	0.59	0.59	0.61	0.63	0.62	0.57	0.54	0.56	0.56	0.51	0.49	0.51	0.54
Lithuania	LTL	4.00	4.00	4.00	4.00	4.00	4.00	3.66	3.06	2.78	2.78	2.76	2.52	2.38	2.50	2.62
Macedonia	MKD	49.84	57.41	58.27	60.83	70.27	72.35	68.72	57.35	52.14	52.11	50.31	45.52	42.37	44.66	46.77
Malaysia	MYR	2.52	2.82	3.93	3.80	3.80	3.80	3.80	3.80	3.80	3.79	3.68	3.45	3.34	3.53	3.23
Mexico	MXN	7.60	7.93	9.15	9.56	9.47	9.35	9.68	10.81	11.31	10.90	10.92	10.94	11.17	13.53	12.65
Morocco	MAD	8.71	9.53	9.62	9.81	10.64	11.32	11.07	9.69	8.97	8.96	8.91	8.22	7.80	8.15	8.49
Nepal	NPR	55.20	56.93	61.76	68.42	71.01	76.00	80.42	78.18	74.86	73.99	75.24	68.31	70.82	78.62	74.37
New Zealand	NZD	1.46	1.51	1.87	1.89	2.20	2.38	2.16	1.72	1.51	1.42	1.54	1.35	1.42	1.60	1.39
Nigeria	NGN	81.86	82.19	86.46	96.00	105.14	116.95	126.40	133.07	133.56	132.10	132.44	128.22	120.15	150.92	152.81
Norway	NOK	6.46	7.08	7.55	7.80	8.80	8.99	7.98	7.08	6.74	6.44	6.42	5.82	5.65	6.30	6.05
Pakistan	PKR	36.00	41.08	48.73	51.40	53.94	62.63	62.26	59.89	60.01	59.74	60.25	60.78	70.73	81.75	85.91
Paraguay	PYG	2,038	2,165	2,690	3,112	3,485	4,054	5,561	6,367	5,861	6,246	5,843	5,172	4,434	5,071	4,849
Peru	PEN	2.45	2.66	2.93	3.38	3.49	3.55	3.66	3.60	3.51	3.31	3.36	3.19	2.96	3.06	2.87
Philippines	PHP	26.23	29.63	41.00	39.15	44.34	51.17	51.73	54.31	56.19	55.14	51.41	45.95	44.56	47.72	45.25
Poland	PLN	2.70	3.28	3.49	3.97	4.35	4.10	4.07	3.89	3.65	3.24	3.11	2.77	2.41	3.13	3.02
Romania	RON	0.31	0.72	0.89	1.54	2.17	2.93	3.41	3.41	3.34	2.94	2.82	2.43	2.53	3.06	3.19
Russian Federation	RUB	5,134	5,787	10,22	24.98	28.17	29.19	31.39	30.70	28.82	28.29	27.19	25.49	24.87	31.86	30.43
Saudia Arabia	SAR	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.75	3.76
Serbia	RSD	4.92	5.00	8.99	10.92	11.61	48.31	63.53	57.68	58.96	67.07	69.36	59.50	56.18	68.02	78.11
South Africa	ZAR	4.30	4.61	5.55	6.12	6.94	8.62	10.53	7.57	6.46	6.38	6.79	7.06	8.28	8.45	7.35
Sri Lanka	LKR	55.31	58.98	64.91	70.77	76.92	89.61	95.78	96.55	101.24	100.59	104.29	111.19	108.62	115.20	113.30
Sudan	SDD	103.74	157.78	197.91	250.35	256.00	256.00	256.00	258.36	258.50	247.28	228.65	206.60	211.54	236.29	236.35
Sweden	SEK	6.71	7.64	7.95	8.27	9.17	10.33	9.72	8.08	7.35	7.47	7.38	6.74	6.59	7.66	7.21
Switzerland	CHF	1.24	1.45	1.45	1.50	1.69	1.69	1.56	1.35	1.24	1.25	1.25	1.20	1.08	1.09	1.04
Syria	SYP	41.95	41.89	41.85	42.29	63.93	55.21	52.29	48.51	52.18	52.98	54.21	53.13	51.08	47.47	47.42
Taiwan	TWD	27.46	28.72	33.50	32.32	31.26	33.99	34.58	34.48	33.47	32.20	32.56	32.89	31.56	33.07	31.56
Thailand	THB	25.36	31.18	41.35	37.88	40.20	44.54	43.07	41.60	40.31	40.31	37.99	32.26	33.27	34.58	31.96
Tunesia	TND	0.98	1.10	1.14	1.19	1.37	1.44	1.43	1.33	1.29	1.31	1.34	1.29	1.25	1.36	1.44
Turkey	TRY	0.08	0.15	0.26	0.42	0.62	1.24	1.54	1.53	1.45	1.35	1.44	1.30	1.31	1.56	1.51
Turkmenistan	TMT	0.65	0.83	0.98	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	2.85	2.85	2.85
Uganda	UGX	1,051	1,088	1,247	1,472	1,655	1,788	1,738	1,845	1,807	1,777	1,847	1,736	1,736	2,051	2,199
Ukraine	UAH	1.52	1.87	2.61	4.35	5.50	5.38	5.49	5.51	5.47	5.16	5.22	5.17	5.37	8.15	8.05
United Kingdom	GBP	0.64	0.61	0.60	0.62	0.66	0.69	0.67	0.61	0.55	0.55	0.54	0.50	0.54	0.64	0.65
Uruguay	UYU	8.03	9.50	10.53	11.26	11.40	12.84	21.32	28.24	28.69	24.46	24.93	23.98	21.28	23.04	20.43
USA	USD	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uzbekistan	UZS	0.00	0.00	94.79	124.64	237.20	941.65	1,013	1,096	1,029	1,010	971	1,286	1,317	1,464	1,587
Venezuela	VEF	0.40	0.49	0.55	0.61	0.68	0.72									

Countries

AF	Afghanistan
AL	Albania
DZ	Algeria
AR	Argentina
AM	Armenia
AU	Australia
AT	Austria
AZ	Azerbaijan
BD	Bangladesh
BY	Belarus
BE	Belgium
BO	Bolivia
BR	Brazil
BG	Bulgaria
CM	Cameroon
CA	Canada
CL	Chile
CN	China
CO	Colombia
HR	Croatia
CY	Cyprus
CZ	Czech Republic
DK	Denmark
EC	Ecuador
EG	Egypt
EE	Estonia
ET	Ethiopia
FI	Finland
FR	France
DE	Germany
GR	Greece
HU	Hungary
IS	Iceland
IN	India
ID	Indonesia
IR	Iran, Islamic Rep of
IE	Ireland
IL	Israel
IT	Italy
JM	Jamaica
JP	Japan
JO	Jordan
KZ	Kazakhstan
KE	Kenya
KR	Korea, Republic of

KG	Kyrgyzstan
LV	Latvia
LT	Lithuania
LU	Luxembourg
MK	Macedonia
MY	Malaysia
MX	Mexico
MA	Morocco
NP	Nepal
NZ	New Zealand
NG	Nigeria
NO	Norway
PK	Pakistan
PY	Paraguay
PE	Peru
PH	Philippines
PL	Poland
PT	Portugal
RO	Romania
RU	Russian Federation
SA	Saudi Arabia
RS	Serbia
SK	Slovakia
SI	Slovenia
ZA	South Africa
ES	Spain
LK	Sri Lanka
SD	Sudan
SE	Sweden
CH	Switzerland
SY	Syrian Arab Republic
TW	Taiwan
TH	Thailand
NL	The Netherlands
TN	Tunisia
TR	Turkey
TM	Turkmenistan
UG	Uganda
UA	Ukraine
GB	United Kingdom
UK	United Kingdom
UY	Uruguay
US	USA
UZ	Uzbekistan
VE	Venezuela
VN	Vietnam

Currencies

AFN	Afghanistan Afghani
ALL	Albanian Lek
AMD	Armenian Dram
ARS	Argentine Peso
AUD	Australian Dollar
AZN	Azerbaijan New Manat
BDT	Bangladeshi Taka
BGN	Bulgarian Lev
BOB	Bolvia Boliviano
BRL	Brazilian Real
BYR	Belarusian Ruble
CAD	Canadian Dollar
CHF	Swiss Franc
CLP	Chilean Peso
CNY	Chinese Yuan Renminbi
COP	Colombian Peso
CZK	Czech Koruna
DKK	Danish Krone
DZD	Algerian Dinar
EEK	Estonian Kroon
EGP	Egyptian Pound
ETB	Ethiopian Birr
EUR	European Euro
GBP	British Pound
HRK	Croatian Kuna
HUF	Hungarian Forint
IDR	Indonesian Rupiah
ILS	Israeli New Shekel
INR	Indian Rupee
IRR	Iranian Rial
ISK	Iceland Krona
JMD	Jamaican Dollar
JOD	Jordanian Dinar
JPY	Japanese Yen
KES	Kenyan Shilling
KGS	Kyrgyzstani Som
KRW	South Korean Won
KZT	Kazakhstan Tenge
LKR	Sri Lanka Rupee
LTL	Lithuanian Litas
LVL	Latvian Lats
MAD	Moroccan Dirham
MKD	Macedonian Denar
MXN	Mexican Peso
MYR	Malaysian Ringgit

NGN	Nigerian Naira
NOK	Norwegian Kroner
NPR	Nepalese Rupee
NZD	New Zealand Dollar
PEN	Peruvian Nuevo Sol
PHP	Philippine Peso
PKR	Pakistan Rupee
PLN	Polish Zloty
PYG	Paraguay Guarani
RON	Romanian New Lei
RSD	Serbian Dinar
RUB	Russian Rouble
SAR	Saudi Riyal
SDD	Sudanese Dinar
SEK	Swedish Krona
SDP	Syrian Pound
THB	Thai Baht
TMT	Turkmenistan New Manat
TND	Tunisian Dinar
TRY	Turkish Lira
TWD	Taiwan Dollar
UAH	Ukraine Hryvnia
UGX	Uganda Shilling
USD	US Dollar
UYU	Uruguayan Peso
UZS	Uzbekistan Som
VEF	Venezuelan Bolívar
VND	Vietnamese Dong
XAF	Communaute Financiere Africaine Franc
ZAR	South African Rand

Others

AMI	Agrarmarkt Informations- Gesellschaft mbH (Germany)
bn	Billion
BSE	Bovine Spongiform Encephalopathy
CEEC	Central and Eastern European Countries
CIF	Cost, insurance, freight (including in the price)
CIRCA	Communication and Information Resource Center for the European Countries
CIS	Commonwealth of Independent states
e.g.	Exempli gratia (for example)
ECM	Energy corrected milk 4% fat, 3.3% protein
etc.	Etcetera
EU	European Union
EUR	Euro
FAO	Food and Agricultural Organisation of the United Nations
FOB	Free on board
h	Hour
ha	Hectare
HF	Holstein Friesian
HH	Household
i.e.	Id est (that is)
ICO	International Coffee Organization

IFCN	International Farm Comparison Network
IMF	International Monetary Fund
kg	Kilogram
l	Litre
ME	Milk Equivalent
MILC	Milk Income Loss Contract (US national program to support low milk prices)
mill	Million
NB	Nota Beta (please note)
No.	Number
SMP	Skim milk powder
t	Metric tons
TIPI-CAL	Technology Impact and Policy Impact Calculations
UHT	Ultra High Temperature (milk)
US-\$	US Dollar
USDA	United States Department of Agriculture
VAT	Value added tax
Vet	Veterinary
Vs	Versus
Xa	Xa region in Chile

Farm Codes

++	Farms better managed than average
AM-A	Armenia-Armavir
AM-SM	Armenia-Shirak Marz
AU-WA	Australia-Western Australia
AU-VI	Australia-Victoria
BR-PR	Brasil-Paraná
CE	Central
CN-IM	China-Inner Mongolia
CN-BE	China-Beijing
CN-HJ	China-Heilongjiang
E	East
ES-CN	Spain-Center North
FR-MC	France-Massif Central
GL	Grassland based
ID-JA	Indonesia-Jabung
ID-NG	Indonesia-Ngatang
N	North
NW	North West
S	South
SE	South East
SW	South West
US-NY	US-New York
US-WI	US-Wisconsin
US-ID	USA-Idaho
W	West

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