



INTERNATIONAL COMPARISON OF PRODUCER PRICES FOR MILK

2000 MILK PRICES

March 2002

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1. Introduction

For dairy farmers the price received for their milk is the major source of income.

In order to obtain a clear picture of the developments and, thereby, to improve the transparency of the dairy market for farmers, the Dutch farmers union (LTO- Nederland) has commissioned the Dutch Dairy Board (Productschap Zuivel) to monitor and systematically compare the prices of raw milk paid by various dairy companies in the EU.

This comparison is realised in co-operation with the European Dairy Farmers (EDF).

Each month a comparison of prices for raw milk paid by a number of large dairy companies located in different countries/regions of the EU is calculated and published (www.milkprices.nl).

Once a year milk prices per calendar year are calculated. This annual report presents the results for calendar year 2000 in chapter 2.

Following chapters describe the method used for the calculations and the assumptions made (chapter 3). In chapter 4 some characteristics of the payments systems of the individual dairy companies and some specific assumptions are made clear.

In the final chapter (5) milk prices are calculated based on different fat and protein contents, quality and annual delivery.

2. Milk prices 2000

The milk prices calculated for the calendar year 2000 are shown in the table below.

Table 1. Standardised milk price calculations for 2000 deliveries (euro/100 kg)

(Price per 100 kg standard milk with 4.20 % fat, 3.35 % protein, total bacterial count 50,000/ per ml, somatic cell count 300,000 per ml and a yearly delivery of 350,000 kg, VAT and levies excluded, supplementary payments for end-of-the-year-profit-distributions are included.)

		2000	2000/1999	
1 (1)	Parmalat	I	36.96	-0.8%
2 (2)	Arla Foods (Sweden)	S	34.46	4.7%
3 (3)	Kymppi	FIN	32.34	1.1%
4 (6)	Friesland Coberco Dairy Foods	NL	31.55	4.3%
5 (14)	Belgomilk	B	31.39	11.4%
6 (4)	Arla Foods (Denmark)	DK	31.27	1.5%
7 (7)	Danone	F	30.91	2.6%
8 (8)	Glanbia	IRL	30.72	2.4%
9 (9)	Bongrain CLE	F	30.71	2.5%
10 (11)	Humana Milch Union eG	D	30.51	4.3%
11 (5)	Campina	NL	30.48	0.1%
12 (10)	Lactalis	F	30.28	2.5%
13 (12)	Nordmilch	D	29.89	2.6%
14 (13)	Golden Vale	IRL	29.17	2.6%
15 (15)	Express Dairies	UK	25.62	-4.2%
16 (16)	Milk Marque/Axis	UK	24.52	-0.3%
AVERAGE MILK PRICE 1)			30.67	2.3%
Other milk prices				
	USA 2)	USA	26.35	-8.1%
	New Zealand 3)	NZ	16.64	+21.9%

Remarks:

Between () ranking 1999.

1. Arithmetic mean
2. Own calculation based on USDA monthly publications of Class III prices adjusted for 4.20 % fat, 3.35 % (crude) protein and somatic cell count of 300.000.
3. Based on paid out prices by the company New Zealand Dairy Group.

The average 2000 milkprice for the 16 European companies was euro 30.67 per 100 kg standard milk. This is an increase of 2.3% compared with 1999.

In 2000 there was a recovery of dairy product prices, especially the skimmed milk powder in the second half of the year. World market prices for European producers improved also because of the depreciation of the euro against the US Dollar.

On top of the list is Italian Parmalat, followed by Arla Foods milk prices paid to the Swedish dairy farmers.

At the bottom are the UK companies Express Dairies and Milk Marque/Axis.

The difference between the highest and lowest milk price is euro 12.44!!

As in other published comparisons Italian milk prices are among the highest in Europe. Some of the following factors are thought to be responsible for this phenomena:

Italy is a net importer of dairy products. Almost half of the domestic milk produced is used for PDO¹ cheeses, like Parmesan cheese.

¹ PDO= Protected Designation of Origin

This means there is less milk left for the dairy companies to process other dairy products. A relatively large part is the liquid milk market of which price setting in most important areas (the big towns) was regulated not so long ago.

It should be noted that Italian milk has very low fat and protein contents, which means that the average prices actually paid to producers are lower than the calculated prices for standard milk.

Without the strength of the British Pound (value up 8% against the euro) the milk prices paid by the British companies would be even lower than shown in the table. The low UK milk prices maybe due to the inefficient dairy structure caused by their milk pricing system in the past. In the past all milk was obligatory collected and sold by the Milk Marketing Boards. High prices for liquid milk made it possible to sell the remainder of the milk at lower prices to processors of cheese and other dairy products. This system gave weak incentives for these processors to invest and become more competitive. The abolition of the MMB's and greater access for dairy products from abroad forced these processors to compete more strongly. In British milk price leagues Milk Marque/Axis and Express dairies also appear at the bottom of the list.

The results of Arla Sweden are influenced by the development of the value of the Swedish Krona. In 2000 the value of the Swedish Krona climbed by 4.3%, which is reflected in an almost similar increase of the milk price expressed in euro. So in 2000 the milk price expressed in national currency did not change much compared to 1999.

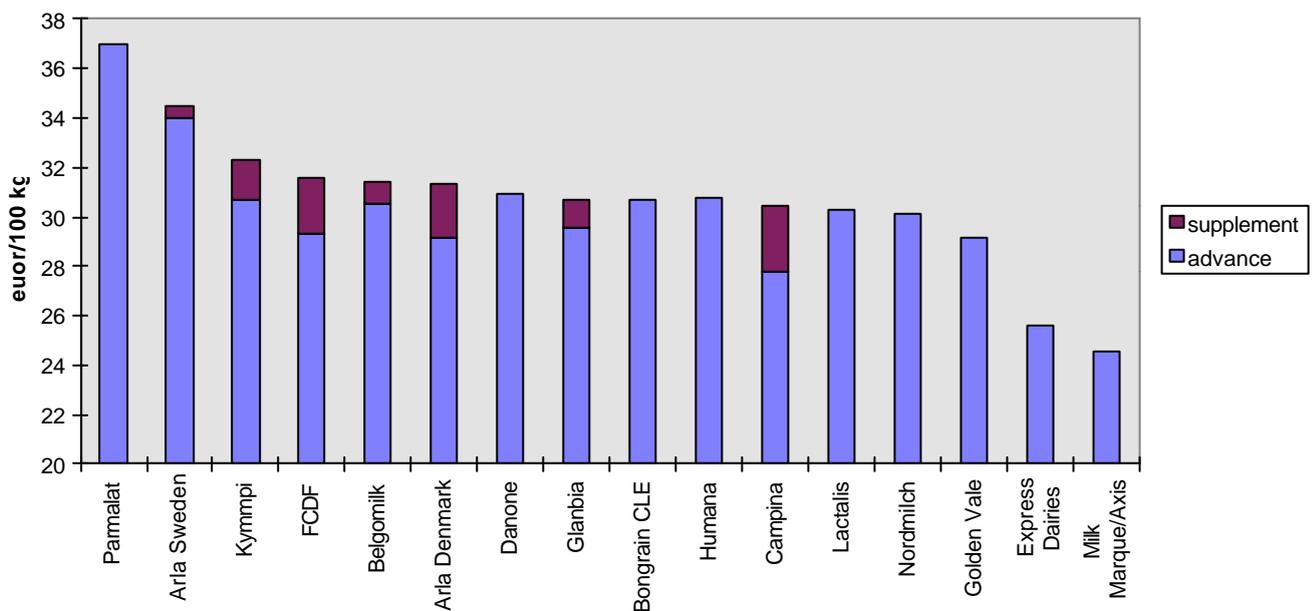
The high level of milk prices in Sweden and Finland could be taken as an indication of the existence of the consumer preferences for 'own' products and the isolated geographical location of both countries.

The strong change in the milk price (and ranking) of Belgomilk compared to 1999 (+ 11.4%) is the result of the low (annual) milk price for 1999 caused by the dioxine-crisis.

In 2000 prices for basic products such as milk powder and butter were relatively very high and is a main reason for the increased Belgomilk milk prices.

Campina did not profit so much from the higher prices for commodities, like butter and skimmed milk powder, as a consequence of their strategy for high value added products. Also their activities in Germany take time to become profitable. The lower ranking of Campina in 2000 compared with 1999 is an expression of their strategy and activities.

Graph 1. Standardised milk price calculations for 2000 deliveries (euro/100 kg)



Graph 1 shows which part of the definitive milk prices is paid on account (monthly advance payments) and which part is supplementary paid after the financial year by the - mostly co-operative - companies. Incidentally also some private companies pay a supplement because of competitive reasons.

The Dutch and Scandinavian (with the exception of Arla Sweden) co-operatives have relatively high supplementary payments. Campina has a target to pay 90 % of the definitive milk price in advance and 10 % as a supplementary payment. For Friesland Coberco (FCDF) these percentages are respectively 95 and 5 %. The supplementary payments of Glanbia are temporary until 2000 and at the time of the Avonmore/Waterford merger agreed.

The German co-operatives Nordmilch and Humana eG made additional payments during the year. These payments are retrospectively added to the monthly milk prices.

Because all profits were reserved for the new company Axis, there was no profit distribution (supplementary payments) by Milk Marque in 2000.

3. Method and assumptions

3.1. Method

Milk payments receipts (one per dairy company) are collected by EDF from various members. These receipts constitute the main input of the project. The milk payment systems adopted by each company were analysed on the basis of these receipts. This and additional information if necessary is incorporated in a calculation model.

This model is able to calculate the monthly milk price using:

1. Monthly data from milk payment receipts, such as fat and protein prices, bonuses or deductions etc.
2. External data, such as exchange rates etc.

Using these data, the model can calculate the monthly milk prices for different:

- a) fat and protein contents;
- b) somatic cell counts and total bacterial counts;
- c) quantity of milk delivered per year.

The values of these parameters built into the calculation model are so chosen as to be representative of a certain standard of quality and scale of deliveries.

The monthly milk prices are weighted on the basis of the national seasonal pattern of deliveries to get a rolling 12 - month average.

It must be emphasised that the result of these calculations is NOT a comparison of the average prices actually paid by the dairies, but the price each company pays for a certain standard quality and quantity of milk based on its own payment system.

3.2. Chosen standards for fat and protein contents, quality and annual delivery

- a) Fat and protein contents

The chosen fat and (crude) protein contents of 4.20 % and 3.35 % (weight percentages) correspond to European averages (see appendix).

- b) Quality

Since the bulk of the milk is able to meet the criteria for a total bacterial count (tbc) of less than 50,000 per ml and for somatic cell count (scc) of less than 300,000 the bonuses or deductions applying to milk with a tbc of (exactly) 50,000 and a scc of (exactly) 300,000 have been included when calculating the comparable milk prices.

- c) Annual delivery

A total annual delivery of 350,000 kg is chosen.

It should be noted that the chosen standards (strongly) influence the outcome of the calculated milk price. E.g. some dairies have strong incentives for lower bacterial or somatic cell count. When a higher quality standard (e.g. total bacterial count less than 25,000 and/or a somatic cell count less than 250,000) is chosen the calculated milk prices for some companies will be significantly higher (and there are consequences for the ranking). Another example are the quantity bonuses of some companies. See chapter 5 for some alternative calculations for different standards.

3.3. Milk price per calendar year

The milk prices for a calendar year are the weighted averages of the monthly milk prices from January to December. The monthly weights are derived from the national seasonal pattern of deliveries.

3.4. Supplementary payments for end of the year profits

For a number of dairies, mainly coops, the monthly milk price is not the final price, but an advance payment. In these cases the final or definitive milk price can be defined as the advance payment plus the supplementary payments depending on which part of the end of the year profits of the dairy company are distributed to the member - suppliers. The end of the year profits can also be added to the general reserves or be added to registered capital.

These supplementary payments are included in the definitive milk prices insofar as they are clearly linked to the quantity of milk delivered and actually distributed to the members. Dividend on shares not linked to the milk delivered and/or additions to the general reserves (these reserves are not allocated to the members but 'in dead hand') are excluded from the supplementary payments.

Supplementary payments are adjusted if the remuneration for the capital invested in the company by the member suppliers is below the market rate (lower than the interest paid on 10 year government bonds)².

Adjustment of supplementary payments according to the date of payment has been made³.

3.5. Other assumptions

Prices have been converted to Euros by using the fixed rates (Euro zone) or the monthly average of the daily exchange rates.

Volume is converted to weight by using a conversion rates of 1 litre equals 1.03 kg. Other conversion rates used are:

1 gallon equals 4.5461 litre
and 1 cwt (USA) equals 45.36 kg.

In Denmark, Sweden and Germany payment of milk is based on kilograms, but the conversion factor used for deliveries is fixed at 1.02. To make the prices comparable one conversion factor is chosen, namely 1 litre equals 1.03. As a consequence the prices in Denmark, Sweden and Germany are corrected (reduced) by multiplying with a factor 1.02/1.03 (is about minus 1%)⁴.

Prices are farm gate prices.

If collection costs are deducted or a bonus is paid if fewer collections are made, the comparable milk price is based on collection every other day.

Payment dates have yet not been taken into account in the monthly milk price calculations (contrary to the supplementary payments which have been adjusted for date of payment). A correction for date of payment of monthly milk prices has little impact on the level of milk prices, because dates of payment do not vary a lot between the companies.

Prices are exclusive of Value Added Tax (VAT) and before deductions of any levies.

4. Dairies and milk payment systems, specific assumptions

² In that case the supplementary payment has been adjusted for an interest loss based on the long term (10- year) government bond yields.

³ Payment has been adjusted by an interest loss based on the number of days between the date of payment and the date in the middle of the delivering period and an interest rate (yearly average of 3- month interest rates for the different EU member states as published by the European Central Bank).

⁴ This correction is discussible. From a Danish point of view the conversion factor should not be corrected, but should be based on the conversion factor fixed by the individual countries. Further consideration to this point of view will be given.

The dairies were selected on the basis of size and location in various countries in the EU. Some dairies adopt different payment systems for different regions. In such cases the region to which the milk price used in the comparison applies is specified.

4.1. Parmalat

Milk prices are based on the contracts between Parmalat and dairy farmers (over 10,000) in the province of Parma (region: Emilia Romagna) - represented by AIPLE⁵- for 1998/99 and 1999/00 (1 April to 31 March 31). Because this contract was not prolonged after March 31 2000 milk prices from April onwards are based on the former contract.

The Parmalat milk price in this comparison is not based on milk which is destined to special cheeses, like the Parmesan cheese, but based on the so called industrial milk.

The price of milk destined to Parmesan cheese is about one third higher than industrial milk.

Like in France also in Italy there are national/regional agreements about the industrial milk price and payment systems. The calculated milk price for Parmalat in the province of Parma is about 1 euro per 100 kg above milk prices according to these agreements.

4.2. Arla Foods Sweden

In April 2000 Swedish Arla and Danish MD Foods merged to Arla Foods. Their target is to have the same milk prices and milk pricing systems from October 2003 onwards. As long as different prices are paid to Danish and Swedish producers/co-operative owners both milk prices are calculated in this milk price comparison.

The financial year of Arla Foods is from October until September. Before the merger with MD Foods, Arla aimed at maximising on account payments. No supplementary payments were made to Swedish producers until June 2000. For the 15 month period July 1999 until September 2000 Arla started paying supplementary payments.

These payments are corrected for invested capital (and date of payment).

4.3. Kymppi group

Kymppi is a group of dairy companies. As a group Kymppi is the fifth largest dairy organisation in Finland, that receives about 6% of the total Finish milk production (1998). Kymppi is chosen in this milk price comparison as an alternative for the large co-operative Valio. The milk price of Kymppi generally follows the payments of Valio.

The calculated milk prices are exclusive of subsidy. When Finland joined the European Union a transitional subsidy per unit of milk was negotiated. The level of this subsidy differ between the regions but can be more than 20% of the milk price.

Half of the supplementary payment over 2000 was deducted as registered capital. Because a market conform interest is paid on this registered capital, the supplementary payments are not adjusted for invested capital. Also Kymppi paid an additional amount for interest loss. So the supplementary payments are also not corrected for date of payment.

⁵ AIPLE= Associazione Interprovinciale Produttore Latte van de provincie Parma.

4.4. Friesland Coberco Dairy Foods

The milk price paid by Friesland Coberco Dairy Foods (FCDF) is based on the percentage change (index) of the milk prices in relation to 1996 of 5 other European companies, namely Campina, Belgomilk, MD Foods, Nordmilch and Humana eG. The milk price is thus not linked to the results of the company. Profit distribution is based on dividend on A- and B- shares.

Unlike most other payment systems fat and protein values are not fixed by the Dutch companies, but vary during the year depending on the market developments and/or expectations for product sales. Both FCDF and Campina have significant seasonal premiums (autumn/winter) and deductions (summer) and very low quality incentives.

For FCDF, the figures given for the supplementary payments in respect of end-of-the year profits exclude the dividend paid on B- shares (which are not linked to the milk delivered), but include the dividend paid on A- shares. Because FCDF financing system is based on the B- shares - which can be traded between members at an internal stock exchange- member- holders receive dividend . So the supplementary payments have not been corrected to take account of capital invested.

The supplementary payments include dividend A and are expressed as a percentage (2000 total 7.92%) of the milk price paid in advance.

4.5. Belgomilk

Though the qualifying criteria for the so-called AA- premium comply with the standards of 50,000 and 300,000 for the total bacterial count and somatic cell count respectively, the AA-premium has not been included in the calculated milk price. Reason is other qualifying criteria for this premium (e.g. animal health) mean that only about 30% of the milk qualifies.

One of the characteristics of the Belgomilk payment system are the relatively high volume bonuses from a yearly delivery of 170,000 litres and more. In the calculated milk price a significant quantity bonus is included, which corresponds with an annual delivery of 350,000 kg. The average delivery per supplier for Belgomilk however is about 160,000 kg/year.

Because capital investment by members is on a voluntary basis and the remuneration is in line with market rates no correction of the supplementary payments has been made to take account of this.

4.6. Arla Foods Denmark

MD Foods merged with Swedish Arla (see paragraph 4.2)

Some characteristics of the MD Foods payment system are the two weekly payments and the seasonal price differentiation. All seasonal bonuses and deductions are not added or deducted from the two weekly milk cheque but paid/received as a lump sum after the end of the financial year.

The milk price determining factors (fat and protein value, costs etc) do not change during the year, only the market bonus (= percentage of the so called basic price) sometimes varies.

MD Foods has a tradition of paying a large supplementary payment. The end of the year profit distribution is 7.8 % of the unstandardised basic price for 1999/00 (October 1999 to September 2000) respectively 7.2 % for 2000/01. Part of this is paid in advance in April.

MD Foods financing system by the members of the co-operative is not based on capital investments, but based on guarantee certificates. These certificates are not taken into account so the supplementary payments are only corrected for date of payment.

4.7. Danone (Pas de Calais)

In France the payment systems are based on contents and quality and differ from region to region and are based on interprofessional regional agreements. For this reason the name of the region concerned has been added to the name of the company. This means the calculated Danone milk price for Pas de Calais may be not representative for other regions in France.

On national level there are quarterly recommendations about the development of the milk prices based on an agreement between representatives of the dairy industry and farmers. These quarterly recommendations are expressed in a price increase or decrease in centimes per litre compared with the same trimester a year ago. In general these recommendations are followed by the dairies.

Danone is a private company.

4.8. Glanbia

The price of Glanbia is based on manufacturing milk only. About 90% of Irish milk production is used for manufacturing milk, only 10 % for liquid milk. Liquid milk suppliers have a separate price schedule. The weighted average price for all milk would add about 3% to the price for manufacturing milk in this publication.

The main characteristic of the Irish milk production is the high seasonal fluctuation. As a consequence Glanbia pays very high winter milk bonuses.

As agreed at the time of the Avonmore/Waterford merger to form Glanbia, up to December 2000 Glanbia will pay supplementary payments based on the difference between the Glanbia price and the average Irish milk price.

These supplementary payments are not corrected for capital investment, because Glanbia is a plc (public limited company). However more than 50% of the shares are held by the member - suppliers (Glanbia Co-operative Society Limited) Glanbia plc is quoted on the Dublin and London stock exchange.

4.9. Bongrain CLE (Basse Normandie)

In addition to the remarks in paragraph 4.7 about the French payment system it should be noted that all the regional payments systems are based on a reference price for a litre of milk which contains 38 grams fat and 32 grams of true protein⁶. The French true protein contents are converted to crude protein by multiplying them with a factor 100/95.

The milk price paid is the reference price adjusted for actual fat and protein contents and actual quality. In the comparable milk price calculation for Bongrain, costs for milk analyses are deducted and a premium for milk control is included.

⁶ All the other countries - except United States of America- express their protein level in crude protein. Crude protein includes also non protein sources. True protein is about 95% of crude protein (or crude protein is about 100/95xtrue protein).

4.10. Humana Milchunion eG

In Germany the milk payment is based on a monthly basic price for 3.7% fat and 3.4% protein and quality class I. This basic price is adjusted for actual fat and protein level by using fixed fat and protein values.

In December 2000 Humana Milchunion eG paid an extra bonus per 100 kg for milk produced during April until November 2000. This bonus is not calculated as a supplementary payment, but this bonus is retrospectively added to the milk prices for April until November 2000 .

Because member suppliers have to invest in member participating units milk prices for Humana Milchunion eG are corrected for this invested capital. This way of calculations results in a negative supplementary payment.

4.11. Campina

The main price determining factors - fat and protein value- are based on market returns for dairy products sold by Campina⁷.

Part of the calculated milk price for Campina is a quantity bonus of Euro 0,45/100 kg.

Like FCDF the quality payment of Campina is based on a pooling system. This means the sum of deductions for farmers who do not meet the quality criteria is distributed to farmers who deliver first class milk.

The target for Campina is to pay 90 % of the milk price on account and 10 % as a supplementary payment. The supplementary payments shown have - besides a correction for date of payment - been corrected to take account of capital invested through the members by participating units.

Part of the profits is not distributed in cash money, but as subordinated bonds. The distribution of these subordinated bonds to the members have been included in the supplementary payments, since the remuneration of these bonds is in line with market rates.

4.12. Lactalis (Pays de la Loire)

For information about the French payment systems in general see paragraph 4.7 and 4.9. Besides variation in the reference price Lactalis like the other French companies does not have separate seasonal bonuses or deductions and does not pay supplementary payments.

Pays de la Loire is the most important milk producing region with about 15 % of the national milk deliveries in France. One of the main characteristics of the Lactalis/ region Pays de la Loire is the strong deduction for milk with a total bacterial count of 50,000 and more and a deduction for somatic cell count of 250,000 and more.

In the comparable milk price for Lactalis the premium for milk control and the so called specialisation premium are included.

⁷ Recently Campina Melkunie changed their name to Campina.

4.13. Nordmilch

Like Humana eG (see paragraph 4.10) the milk payment of Nordmilch is based on a base price adjusted for actual fat and protein. Fixed costs per month and per collection are deducted.

Nordmilch made no retrospective payments in the course of 2000 and no supplementary payments. A correction is made for invested capital based on member participating units. This correction is calculated as a negative supplementary payment.

4.14. Golden Vale

The Golden Vale milk price is like Glanbia - see paragraph 4.8- based on manufacturing milk. Because of different regional pricing it should be noted the milk price of Golden Vale is based on southern Ireland. In the calculated milk price costs per collection (until April 2000) are included.

The winter milk bonus from November until February of 20 pence per gallon does not apply to all milk delivered in this period but to a certain quantity corresponding with 4 X December or January delivery. Based on the national seasonal pattern this quantity is estimated at 75% of total milk delivered in that period. For this reason the bonus calculated in the milk price is 15 (= 0,75 x 20) pence per gallon from November until February.

Golden Vale is a private company with no supplementary payments.

4.15. Express Dairies

Express Dairies is a plc (public limited company). Notwithstanding the fact that most shares are held by farmer suppliers, shares are quoted at an external stock exchange. No corrections is made for invested capital (and paid dividend is also not included).

Express Dairies is the only dairy in the comparison which milk payment for protein is capped at a maximum of 3.30%. This is due to their high liquid milk sales which makes it difficult to earn on higher protein contents.

The milk price calculation of Express Dairies is based on input from South England. Depending on the distance to the factory different milk pricing is possible.

The payment system of Express Dairies is characterised by strong quality incentives. Also volume bonuses are paid from 1,000 litre a day. In the milk price calculations these bonuses for quality and volume are zero for the chosen standards.

4.16. Milk Marque/Axis

April 1st 2000 Milk Marque split into 3 regional co-operatives, i.e. Zenith (North), Axis (Mid) and Milk Link (South). From this date onwards calculated milk prices relate to Axis⁸.

There was no profit distribution for 1999/00, because all profits were reserved for the new company Axis. Because members receive remuneration in line with market rates in respect of invested capital no correction has been made to take account of capital investments by members.

Costs per collection and premium for every other day are included in the milk price.

⁸ Recently Axis merged with Scottish Milk to First Milk.

4.17. Milk prices USA and New Zealand

USA

The milk price calculated for the USA is based on the USDA announcement of monthly Class III and component prices and are adjusted to take account of the standards adopted for fat, protein and somatic cell count.

The Class III price can be seen as a kind of minimum milk price paid to producers. The actually paid out prices are a bit higher, because milk is not only processed to cheese (class III is mainly cheese) but also to other higher value added dairy products.

New Zealand

New Zealand milk prices are based on prices published by the dairy co-operative New Zealand Dairy Group (NZDG) ⁹ adjusted for 4.20 fat and 3.35 % protein. These prices are not adjusted for invested capital. Dairy farmers who supply to NZDG have to buy shares related to the quantity of milk delivered.

⁹ NZDG recently merged with KIWI to Fonterra

5. Sensitivity analysis

So far the comparison has been in terms of standard milk. Of course not all milk is standard milk. This chapter presents the results of alternative calculations to demonstrate the effect of fat and protein content, quality criteria and annual delivery, when using values which differ from the standard.

5.1. Fat and protein content

Alternative calculations (1 and 2) are made for lower (3.60% fat and 3.20 % protein) and higher (4.40% fat and 3.45% protein) contents. These alternative contents correspond with the lowest and highest national averages (see appendix).

Table 3. Standard and alternative calculations for lower and higher contents (euro/100 kg)

	alternative	1		2			
	Standard	Lower	Higher	Higher			
	fat %	3.60	4.40				
	protein %	3.20	3.45				
1 Parmalat	36.96	-3.49	33.47	1	+1.50	38.46	1
2 Arla Foods (Sweden)	34.46	-2.48	31.98	2	+1.02	35.48	2
3 Kymppi	32.34	-2.20	30.14	3	+1.06	33.40	3
4 Friesland Coberco Dairy F.	31.55	-2.99	28.56	5	+1.25	32.80	4
5 Belgomilk	31.39	-2.82	28.57	4	+1.16	32.55	5
6 Arla Foods (Denmark)	31.27	-2.78	28.49	6	+1.16	32.43	6
7 Danone	30.91	-2.48	28.43	7	+1.10	32.01	7
8 Glanbia	30.72	-2.35	28.37	8	+1.03	31.75	9
9 Bongrain CLE	30.71	-2.50	28.21	9	+1.09	31.80	8
10 Humana Milch Union eG	30.51	-2.43	28.08	10	+1.01	31.52	11
11 Campina	30.48	-2.71	27.77	11	+1.17	31.65	10
12 Lactalis	30.28	-2.70	27.58	12	+1.19	31.47	12
13 Nordmilch	29.89	-2.35	27.54	13	+1.01	30.90	13
14 Golden Vale	29.17	-2.36	26.81	14	+1.05	30.22	14
15 Express Dairies	25.62	-1.82	23.80	15	+0.46	26.08	15
16 Milk Marque/Axis	24.52	-2.26	22.26	16	+0.98	25.50	16

Except for Parmalat (-3.49 (highest)) and Express Dairies (-1.82 (lowest)) milk price change related to the standard ranges between minus 2.20 (Kymppi) and minus 2.99 (Friesland Coberco) for lower contents and plus 0.98 (Milk Marque/Axis) and 1.25 (Friesland Coberco) for higher contents.

Taking into account the great variety in valuation of the fat and protein components in the different payment systems these ranges seem rather narrow.

Though the difference in content has a strong impact on the price level, the consequences for the ranking are limited.

The difference for Express Dairies is because this is the only company in the comparison for which protein payment is capped at a maximum of 3.30 %.

It should be noted that the calculated milk price change related to standard milk price does not include the impact on the supplementary payments. The supplementary payments for Friesland Coberco dairy Foods, Campina, Arla and Belgomilk are (partially) based on content, which means in the case of these companies the impact of lower or higher fat and protein content is slightly higher than presented in table 3. This does however not lead to significant changes.

5.2. Yearly delivery

Two calculations (alternative 3 and 4) refer to a lower (200.000 kg) and a higher (700.000 kg) annual delivery. An annual delivery of 200,000 kg is between the average of all countries (257,000 kg, see appendix) and the national averages in countries with the lowest annual deliveries.

An annual delivery of 700,000 kg is taken to present an example for the milk price for the growing group of large dairy farms.

Table 4. Standard and alternative calculations for lower and higher annual delivery (euro/100 kg)

alternative	Standard kg/year 350,000	3		4			
		Lower 200,000		Higher 700,000			
1 Parmalat	36.96		36.96	1	36.96	1	
2 Arla Foods (Sweden)	34.46	-0.15	34.31	2	+0.10	34.56	2
3 Kymppi	32.34		32.34	3		32.34	4
4 Friesland Coberco Dairy F.	31.55	-0.27	31.28	4	+0.18	31.73	5
5 Belgomilk	31.39	-0.92	30.47	9	+0.97	32.36	3
6 Arla Foods (Denmark)	31.27	-0.27	31.00	5	+0.18	31.45	6
7 Danone	30.91	-0.01	30.90	6	+0.01	30.92	7
8 Glanbia	30.72		30.72	7		30.72	9
9 Bongrain CLE	30.71		30.71	8		30.71	10
10 Humana Milch Union eG	30.51	-0.14	30.37	10	+0.09	30.60	11
11 Campina	30.48	-0.30	30.18	12	+0.31	30.79	8
12 Lactalis	30.28		30.28	11		30.28	12
13 Nordmilch	29.89	-0.16	29.73	13	+0.11	30.00	13
14 Golden Vale	29.17	-0.02	29.15	14	+0.01	29.18	14
15 Express Dairies	25.62		25.62	15	+0.64	26.26	15
16 Milk Marque/Axis	24.52	-1.03	23.49	16	+0.69	25.21	16

For companies with high volume bonuses (Belgomilk and to a lesser extent Campina) and/or high fixed costs (Milk Marque/Axis) the level of the calculated milk prices strongly depends on the chosen yearly delivery. The calculated milk price for Belgomilk should drop 0.92 euro when taking into account an annual delivery of 200,000 (which is about the average in Belgium) in stead of the standard chosen at 350,000 kg per year.

5.3. Quality

No proper overview is available of the average and the variation in the total bacterial count (tbc) and somatic cell count (scc) for the different countries. Information available indicates most milk can meet a tbc of less than 25,000 per ml and a scc less than 250,000 per ml. Therefore an alternative calculation (5) is based on a tbc 24,999 per ml and a scc 249,999 per ml.

Table 4 Milk price based on total bacterial count of 24,999 and somatic cell count of 249,999 per ml (and 4.20 % fat and 3,35 % protein and 350,000 kg per year)

	alternative		5	
		Standard		
	tbc	50,000	24,999	
	scc	300,000	249,999	
1 Parmalat		36.96	36.96	1
2 Arla Foods (Sweden)		34.46	+0.12 34.58	2
3 Kymppi		32.34	+1.63 33.97	3
4 Friesland Coberco Dairy F.		31.55	31.55	5
5 Belgomilk		31.39	31.39	9
6 Arla Foods (Denmark)		31.27	+0.66 31.93	4
7 Danone		30.91	+0.59 31.50	6
8 Glanbia		30.72	30.72	10
9 Bongrain CLE		30.71	+0.74 31.45	8
10 Humana Milch Union eG		30.51	30.51	11
11 Campina		30.48	30.48	12
12 Lactalis		30.28	+1.18 31.46	7
13 Nordmilch		29.89	29.89	13
14 Golden Vale		29.17	29.17	14
15 Express Dairies		25.62	+1.19 26.81	15
16 Milk Marque/Axis		24.52	+0.80 25.32	16

Regarding quality incentives large differences exist between the companies.

Kymppi and Lactalis pay a relatively high quality bonus for milk with a total bacterial count and somatic cell count less than 50,000 respectively 250,000 per ml. Because the chosen standards for total bacterial count and somatic cell count are (exactly) 50,000 respectively 300,000 these quality bonuses are not part of the calculated milk price for standard milk. Also the UK companies, especially Express Dairies, pay high quality bonuses.

5.4. Different input per company

In addition to the calculations presented in the previous paragraphs, based on the input of overall parameter values for all companies, an alternative calculation (6) is made based on different contents and annual delivery per company. These contents and annual delivery are based on the national averages (see appendix). Because no proper overview of the average total bacterial count (tbc) and somatic cell count (scc) per country is available, the quality criteria are not differentiated between the companies in this alternative calculation. Information available indicates a tbc of 24,999 and a scc of 249,999 is more representative for the average quality in the involved countries than the standard (tbc 50,000 and scc 300,000). So the alternative calculations in this paragraph are based on a tbc 24,999 and a scc 249,999 for all (!) companies.

Table 5. Milk price based on national average contents and annual delivery (and total bacterial count of 24,999 and somatic cell count of 249,999 per ml)

alternative		Standard	5		
	fat%	4.2	national average		
	protein%	3.35	national average		
	annual delivery	350,000	national average		
	tbc	50,000	24,999		
	scc	300,000	249,999		
1	Parmalat	36.96	-2.65	34.31	2
2	Arla Foods (Sweden)	34.46	-0.05	34.41	1
3	Kymppi	32.34	+1.46	33.80	3
4	Friesland Coberco Dairy F.	31.55	+1.24	32.79	5
5	Belgomilk	31.39	-1.40	29.99	12
6	Arla Foods (Denmark)	31.27	+1.62	32.89	4
7	Danone	30.91	+0.25	31.16	7
8	Glanbia	30.72	-1.90	28.82	13
9	Bongrain CLE	30.71	+0.43	31.14	8
10	Humana Milch Union eG	30.51	+0.21	30.72	10
11	Campina	30.48	+1.19	31.67	6
12	Lactalis	30.28	+0.85	31.13	9
13	Nordmilch	29.89	+0.21	30.10	11
14	Golden Vale	29.17	-1.92	27.25	14
15	Express Dairies	25.62	+1.25	26.87	15
16	Milk Marque/Axis	24.52	+0.56	25.08	16

Based on table 5 ('national average') it can be concluded that the differences in 'national average' milk prices are less than the differences for standard milk. So the differences in actually paid out milk prices probably are also less than the differences for standard milk. Especially dairies in countries with low contents (Italy, Ireland) are lower ranked in table 5.

The lower ranking of Belgomilk in relation to the standard calculation is due to their high volume bonus for 350,000 kg per year.

5.5. Summary and conclusions

In this chapter alternative calculations have been presented to show the consequences of different parameter values.

Standard:

Price per 100 kg standard milk with 4.20 % fat, 3.35 % protein, total bacterial count 50,000/ per ml, somatic cell count 300,000 per ml and a yearly delivery of 350,000 kg, VAT and levies excluded, supplementary payments for end-of-the-year-profit-distributions are included.)

Alternatives:

1. Lower contents: 3.60 % fat and 3.20 % protein.
2. Higher contents: 4.40 % fat and 3.45 % protein.
3. Lower yearly delivery: 200,000 kg.
4. Higher yearly delivery: 700,000 kg.
5. Higher quality: total bacterial count 24,999 per ml and somatic cell count 249,999 per ml.
6. Different input per country, based on national average contents and annual delivery (and lower total bacterial count and somatic cell count).

Table 6 Difference between standard and alternative calculations

Alternative calculations	Standard	Difference in relation to standard milk (euro/100 kg)						
		1	2	3	4	5	6	
Parmalat	I	36.96	-3.49	1.50	0.00	0.00	0.00	-2.65
Arla Foods (Sweden)	S	34.46	-2.48	1.02	-0.15	0.10	0.12	-0.05
Kymppi	FIN	32.34	-2.20	1.06	0.00	0.00	1.63	1.46
Friesland Coberco Dairy Foods	NL	31.55	-2.99	1.25	-0.27	0.18	0.00	1.24
Belgomilk	B	31.39	-2.82	1.16	-0.92	0.97	0.00	-1.40
Arla Foods (Denmark)	DK	31.27	-2.78	1.16	-0.27	0.18	0.66	1.62
Danone	F	30.91	-2.48	1.10	-0.01	0.01	0.59	0.25
Glanbia	IRL	30.72	-2.35	1.03	0.00	0.00	0.00	-1.90
Bongrain CLE	F	30.71	-2.50	1.09	0.00	0.00	0.74	0.43
Humana Milch Union eG	D	30.51	-2.43	1.01	-0.14	0.09	0.00	0.21
Campina	NL	30.48	-2.71	1.17	-0.30	0.31	0.00	1.19
Lactalis	F	30.28	-2.70	1.19	0.00	0.00	1.18	0.85
Nordmilch	D	29.89	-2.35	1.01	-0.16	0.11	0.00	0.21
Golden Vale	IRL	29.17	-2.36	1.05	-0.02	0.01	0.00	-1.92
Express Dairies	UK	25.62	-1.82	0.46	0.00	0.64	1.19	1.25
Milk Marque/Axis	UK	24.52	-2.26	0.98	-1.03	0.69	0.80	0.56

The level of the milk price is most sensitive for the fat and protein content. Fat and protein content are the leading price determining factors.

The quality criteria selected have a relatively strong influence on the ranking, because of a wide range of quality incentives between the different companies.

Though big suppliers obtain a higher milk price from most companies, the variety in volume bonuses (or fixed costs) in general is less than the variety in quality premiums. Belgomilk (high volume bonuses) and Milk Marque Axis (high fixed costs) represent two exceptions to this general rule.

Based on the results of these sensitivity calculations further consideration will be given to improve the comparison by taking different parameter values, for example stricter quality criteria.

Appendix National average contents and annual delivery

	fat %	protein %	yearly delivery kg
Italy	3.705	3.260	156,000
Sweden	4.225	3.305	259,000
Finland	4.275	3.300	98,000
Netherlands	4.375	3.460	378,000
Belgium	4.090	3.335	198,000
France	4.100	3.345	161,000
Germany	4.235	3.415	192,000
Ireland	3.685	3.245	182,000
Denmark	4.350	3.425	460,000
United Kingdom	4.050	3.300	486,000
Average	4.109	3.339	257,000

Source: Protein and fat contents are based on Dairy facts and figures 2000 average 1998/99 with an adjustment for France based on CNIEL L'Economie des chiffres 2000. Source: Yearly delivery is based on provisional rounded average milk production per farm from Statistisch Jaaroverzicht Productschap Zuivel.

Graph 1 National average contents

