



What is the cost of producing milk?

**Calculation of milk production costs
based on the Farm Accountancy Data Network (FADN)
in Belgium, Denmark, France, Germany, Luxembourg
and the Netherlands**

**Results for 2017
Cost trends and milk price comparison since 2010**

Second edition





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All studies and brochures on milk production costs in different EU Member States can be found on the EMB website:
www.europeanmilkboard.org/en/milk-production-costs.html

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Introduction

Knowledge about the evolution of costs in European milk production directly affects how well and how realistically we can represent and understand developments on the dairy market. The lack of this kind of overview in the sector sparked the idea of a cost study in 2011, as something that would provide regular updates on cost developments in different European countries and would be available to all stakeholders EU-wide. A further aim of this longitudinal study was to make a contribution to mapping the influence and effect of the Common Agricultural Policy on national and regional structures.

In 2012 and against this backdrop, the dairy farmer associations within the European Milk Board (EMB) commissioned the BAL – Büro für Agrarsoziologie und Landwirtschaft (Bureau for Rural Sociology and Agriculture) of the Die Landforscher network to carry out a regular study of milk production costs. These calculations are based on official representative data for the most important milk-producing countries in the EU. Dairy farmer associations from six European countries (Belgium, Denmark, Germany, France, Luxembourg and the Netherlands) are currently participating in this joint project. The cost of milk production in the respective EU Member States is calculated using a common methodology and is regularly updated on behalf of these associations.

The current and past economic problems faced by milk producers cannot be understood without considering how costs have developed on farms. Evaluating the economic situation on dairy farms by only looking at milk prices is very short-sighted. Regularly updated cost development studies based on universally applicable, representative data can provide transparent insight about the overarching economic situation of milk producers to political decision-makers as well as the public and different economic partners.

Furthermore, the accurate and systematic observation of the evolution of production costs is very useful to farmers, as they can adapt their economic behaviour to dairy market trends and thus strengthen their position: since the implementation of the EU Milk Package in 2012, dairy farmers can use the option of pooling to form producer organisations, in order to collectively negotiate milk prices with the processing industry. Reliable information about production costs is an important factor in this regard.

As of 2013, the results of the milk production cost studies carried out in different European countries have been regularly published in the BAL's "What is the cost of producing milk?" reports. These documents include detailed figures and conclusive facts about the situation and evolution of costs on dairy farms of different sizes and in different regions of the EU. For readers interested in a quick overview, the participating dairy farmer associations also publish brochures with a summary of the most important facts and conclusions, which is complemented by a data sheet published by the EMB that provides a concise synopsis of the figures.

You can find the full list of publications at <http://www.europeanmilkboard.org/en/milk-production-costs.html>. A comprehensive list of all publications is also included on the last page of this report.

In the second edition of this overview, the cost calculation has been updated to the year 2017. It also includes the following new features: the latest results from Luxembourg are now included in this edition. Also, for the analysis of milk production costs in Belgium, the basis for the calculation of labour costs has been changed. Furthermore, for all milk-producing countries, an analysis of net investments in dairy farms has been included. This shows what capital investment is required on the farms in addition to production costs to secure dairy farms in the future.

Synopsis — Milk production costs in 2017 in six European milk-producing countries

The cost calculations in the joint report document the minimum farm gate price that must be paid to farmers to ensure that production costs are covered – including appropriate remuneration for farmers themselves as well as their contributing family members.

An analysis of milk production costs up to 2017 is currently available for six important milk-producing countries: Belgium, Denmark, Germany, France, Luxembourg and the Netherlands.

According to Eurostat's current figures (2018), these six countries accounted for 81 million tonnes of milk or about 50% of the total milk produced in the EU-28 in 2016.

In 2017, milk production costs in these countries were between 38.74 and 45.14 cents per kilogram. The farm gate price, however, was only between 34.42 and 37.40 cents per kilogram. This vast gap between costs and prices led to a shortfall of up to 24%.

Table 1: Milk production costs and farm gate prices in 2017 in six European countries in cents per kilogram

Milk-producing country	Belgium	Denmark	France	Germany	Luxembourg	Netherlands
Production costs (end total without net investments)	42.53	38.74	45.14	41.81	42.62	42.01
Farm gate price	35.05	36.79	34.42	37.40	34.83	35.45
Cost shortfall in cents per kg	-7.48	-1.95	-10.72	-4.41	-7.79	-6.56
Cost shortfall in per cent	-18%	-5%	-24%	-11%	-18%	-16%

What is the cost of producing milk?

The shown costs of milk production do not include the farms' costs for investments. On average over the last 10 years (2007-2016), milk producers invested between 1.58 and 6.27 cents per kilogram net (excluding depreciation). In France, net investments were negative, i.e. the farms' physical capital decreased. The milk price should also cover

investment costs, not only because they are necessary to secure the future of dairy farms, but also because dairy farmers need to be able to adapt their production, for example, to a changing demand in terms of food quality, environmental standards and animal welfare.

Table 2: Net investments in six milk-producing countries in cents per kilogram (10-year average)

Milk-producing country	Belgium	Denmark	France	Germany	Luxembourg	Netherlands
Net investments (Ø 2007-2016)	3.27	4.74	-0.17	1.58	6.27	5.80

Details about the structure of dairy farms

The herd size of the surveyed dairy farms varied from an average 59 to a maximum 165 dairy cows on an area of 51 to 156 hectares. Annual milk yields were between 6,949 and 9,585 kilograms.

The average dairy farm in France has a comparatively large area with a smaller dairy herd. The available area on Dutch farms, on the other hand, is very small in relation to

the much higher number of cows. Danish dairy farms show the highest figures in terms of area, herd size and milk yield. The high proportion of hired labour in Denmark stands out. German and Belgian dairy farms are very similar in terms of milk yield and herd size. However, Belgian dairy farms show a greater number of family farms.

Table 3: Dairy farm structure (average farm in 2016)

Country	Area in hectares	Dairy cows	Milk yield (kg)	Total Annual Work Units (AWU)	Family Annual Work Units (FAWU)
Belgium	54	75	7,558	1.77	1.73
Denmark	156	165	9,462	2.88	1.21
France	92	63	6,802	1.85	1.63
Germany	72	59	7,472	1.96	1.45
Luxembourg	94	69	7,622	1.75	1.55
Netherlands	51	92	8,218	1.80	1.54

Table 4: Composition of milk production costs in cents per kilogram in 2017

Milk-producing country	Belgium	Denmark	France	Germany	Luxembourg	Netherlands
Input costs (<i>seeds, fertilizers, plant protection products, bought-in feed, cost of equipment & machine maintenance and energy</i>)	15.66	18.13	18.39	17.55	19.43	16.55
General operating costs (<i>other specific costs for plant and animal production and all non-specific costs like labour, other general costs, paid wages, rent, interest and taxes in 2015</i>)	15.34	24.04	23.59	20.51	24.76	21.33
Incurred production costs in total (paid costs)	31.00	42.17	41.98	38.06	44.19	37.88
Revenue from beef production (deduction)	-3.62	-5.00	-6.94	-5.88	-6.72	-3.01
Production costs minus revenue from beef	27.38	37.17	35.04	32.18	37.47	34.87
Income variable	17.54	4.08	14.21	12.73	12.46	9.12
Total milk production costs	44.92	41.25	49.25	44.91	49.93	43.99
Subsidies (deduction)	-2.39	-2.51	-4.11	-3.10	-7.31	-1.98
Milk production costs (end total without net investments)	42.53	38.74	45.14	41.81	42.62	42.01
net investments (Ø 2007-2016)	3.27	4.74	-0.17	1.58	6.27	5.80
Production costs (end total with net investments)	45.80	43.48	44.97	43.39	48.89	47.81

You can find detailed information about the calculation method as well as the used base data and sources in the commissioned base studies published on the EMB website under the title "What is the cost of milk production?". The methodological updates carried out after the publication of the baseline studies are presented in this comprehensive brochure for 2017.

For more information, please contact the author of the study at the BAL – Büro für Agrarsoziologie und Landwirtschaft (Bureau for Rural Sociology and Agriculture).

What is the cost of producing milk?

The cost of inputs contributing to production costs, i.e. seeds, fertilizers, plant protection products, bought-in feed, machine and equipment maintenance as well as energy, was between 15.66 and 19.34 cents per kilogram in the six production countries and thus quite similar. These cost headings have been extrapolated to the year 2017. For home-grown fodder (hay, silage), the costs for the required seeds, fertilizers and plant protection products as well as other costs for crop production are considered.

As production costs were first reported for all cattle on the farm, the revenue from bovine animal production (e.g. from the sales of calves, fattening and breeding animals) was deducted in the next step. This gives us the production costs for milk alone.

Together with general operating costs (between 15.34 and 24.76 cents) and post deduction of revenue from bovine animal production, the subtotal for production costs is between 27.38 cents per kilogram in Belgium and 37.47 cents per kilogram in Luxembourg. These are costs incurred by the farm for milk production alone – they do not include the cost of family labour. Simply due to the cost of contract work, wages, depreciation, interest and taxes to the tune of around 17 cents, the incurred production costs in Denmark and Luxembourg are comparatively very high. In Germany and Belgium, around 5 and 8 cents less are spent on these cost items, respectively.

The calculation only considers those operational costs that can be traced back to milk production on specialised dairy farms (see Allocation Legend in Calculation Diagram, p. 28/29). All costs are net values excluding value-added tax and refer to a milk equivalent with 33g protein and 40g fat.

The comparatively low income variable in Denmark can be explained by the significantly larger milk volume (165 dairy cows and milk yield of 9,462 kilograms, see *Table 3*) for a comparatively much smaller number of family workers. In Belgium, on the other hand, dairy farms continue to be almost exclusively family-run without any hired labour.

The end total for milk production costs in the different milk-producing countries is between 38.74 and 45.14 cents per kilogram (*Table 2*). Subsidies are seen as income and are therefore deducted from the total production costs. The end total does not include the imputed costs for land, capital and net investments (*Table 5, Table 2*).

Before the publication of the first study on milk production costs in Germany in 2013, the logic and methodology used for cost calculation was examined and approved by independent experts. In essence, the methodology used to calculate production costs closely mirrors that used by the European Commission's Directorate General for Agriculture (DG AGRI) in the EU Dairy Farms Report.

Table 5: Imputed costs in 2017 in the six milk-producing countries in cents per kilogram

	Belgium	Denmark	France	Germany	Luxembourg	Netherlands
Land (rent variable)	0.58	3.43	0.31	1.22	1.49	2.48
Capital (interest variable)	0.17	0.29	0.56	-0.20	0.28	0.25
Total	0.75	3.72	0.87	1.02	1.77	2.73

* The stated farm gate prices in this table refer to varying fat and protein content (sources are cited in the country-specific data sheets).

Table 6: Cost shortfall in the last five years

Year	2013	2014	2015	2016	2017	Ø 2012-2016
Belgium						
Milk production costs in cents/kg	46.96	46.09	45.20	42.12	42.53	44.58
Farm gate milk price in cents/kg*	37.22	36.00	27.93	26.70	35.05	32.58
Shortfall in per cent	-21%	-22%	-38%	-37%	-18%	-27%
Shortfall in cents/kg	-9.74	-10.09	-17.27	-15.42	-7.48	-12.00
Denmark						
Milk production costs in cents/kg	42.85	42.76	39.75	39.34	38.74	40.69
Farm gate milk price in cents/kg*	38.63	39.67	31.03	28.68	36.78	34.96
Shortfall in per cent	-10%	-7%	-22%	-27%	-5%	-14%
Shortfall in cents/kg	-4.22	-3.09	-8.72	-10.66	-1.96	-5.73
France						
Milk production costs in cents/kg	46.88	49.67	45.74	44.49	45.14	46.38
Farm gate milk price in cents/kg*	35.30	37.34	32.29	30.18	34.42	33.91
Shortfall in per cent	-25%	-25%	-29%	-32%	-24%	-27%
Shortfall in cents/kg	-11.58	-12.33	-13.45	-14.31	-10.72	-12.47
Germany						
Milk production costs in cents/kg	45.90	44.39	41.20	42.44	41.81	43.15
Farm gate milk price in cents/kg*	38.75	38.78	30.53	27.93	37.40	34.68
Shortfall in per cent	-16%	-13%	-26%	-34%	-11%	-20%
Shortfall in cents/kg	-7.15	-5.61	-10.67	-14.51	-4.41	-8.47
Luxembourg						
Milk production costs in cents/kg	42.92	42.73	42.94	42.43	42.62	42.73
Farm gate milk price in cents/kg*	35.69	36.39	28.82	27.48	34.83	32.64
Shortfall in per cent	-17%	-15%	-33%	-35%	-18%	-24%
Shortfall in cents/kg	-7.23	-6.34	-14.12	-14.95	-7.79	-10.09
Netherlands						
Milk production costs in cents/kg	44.57	46.47	42.46	42.07	42.01	43.52
Farm gate milk price in cents/kg*	37.40	38.90	30.75	28.75	35.45	34.25
Shortfall in per cent	-16%	-16%	-28%	-32%	-16%	-21%
Shortfall in cents/kg	-7.17	-7.57	-11.71	-13.32	-6.56	-9.27

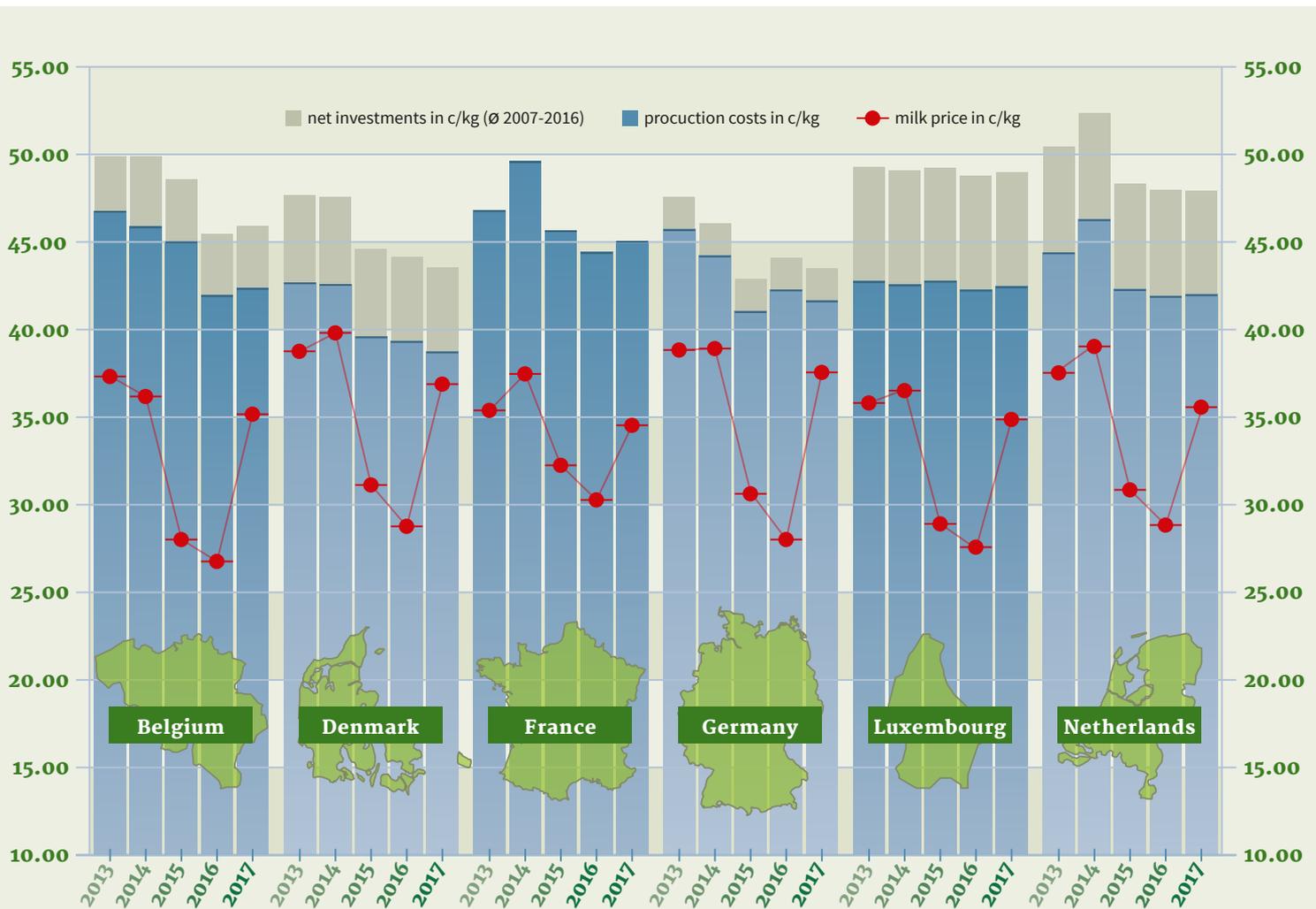
Table 6 and Figure 1 present the cost development over the last five years until 2017. The results for 2017 are extrapolated values.

A similar dramatic evolution is observed in all countries. At no point in the five years did farm gate prices cover production costs. Milk production costs had risen sharply in 2013 and 2014. The brief price peak in 2014 provided only momentarily some relief to dairy farmers. The long-lasting producer-price crisis in 2015 and 2016 was characterised by drastic price collapses. Despite much lower milk production costs, dairy farmers were in a more difficult economic situation than in the two previous years.

Dairy farms had to react to the crisis by reducing costs and were therefore forced to forgo expenses that are necessary for stable and future-oriented farm development. They barely undertook any investments and had to save on all fronts. This is documented by the significant reductions in depreciation and interest as well as the sharp drop in wages.

This situation did not change in 2017 either, as milk prices had risen only moderately and farm gate milk prices continued to be insufficient to generate an adequate income for dairy farmers.

Figure 1: Development of production costs and milk prices 2013-2017





Milk production costs 2017 – country data sheets

Milk Production Costs 2017



→ Belgium

In 2017, the production costs for one kilogram of milk in Belgium were 42.53 cents. Even if the milk price increased by 8.35 cents from 2016 to 2017, 18% of the costs were not covered. Over the last 10 years, between 2007 and 2016, Belgian milk producers invested an average of 3.27 cents net per kilogram of milk. These costs are not yet included in the costs. In response to falling milk prices, necessary investments in means of production were cut back sharply

at least until 2016 (-2,25 cents since 2014). This resulted in falling depreciation and the resulting drop in production costs since 2015.

In the present edition, a new income variable was introduced to calculate the labour costs of self-employed family workers in Belgium. Milk production costs since 2010 have been recalculated based on this approach and the FADN 2016 data.

Overview of milk production costs in Belgium in 2017*

cost items	in cents / kg
+ bought-in feed	9.80
+ home-grown fodder (seeds, fertilizers, plant protection products, other)	2.25
+ livestock costs (veterinary costs, insemination, etc.)	3.07
+ building & machine upkeep	2.17
+ energy	1.57
+ contract work	2.63
+ wages paid	0.19
+ other indirect costs	0.75
+ rent paid	1.79
+ depreciation	5.12
+ interest and taxes	1.66
- production value of beef	-3.62
= incurred costs of milk production (only for delivered milk)	27.38
+ income variable (labour costs)	17.54
= total production costs	44.92
- subsidies	-2.39
= milk production costs	42.53
+ net investments (10-year average)	3.27
= milk production costs including net investments	45.80

Development of investments in Belgium 2007–2016 in cents/kg (based on FADN 2016)

year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Ø 10 years
gross investments	9.70	11.99	7.53	9.75	7.15	8.31	9.57	8.42	6.78	5.27	8.45
net investments (without depreciation)	4.87	6.61	2.59	4.47	1.78	2.96	3.68	3.17	1.67	0.92	3.27

Milk production costs in Belgium in cents/kg (based on FADN 2016)

year	paid costs	+ income variable	= total costs	- subsidies	= production costs	+ net investments Ø (2007-2016)	= costs + net investments
2017*	27.38	17.54	44.92	2.39	42.53	3.27	45.80
2016	26.68	17.83	44.51	2.39	42.12		45.39
2015	28.25	19.22	47.47	2.27	45.20		48.47
2014	29.62	21.02	50.64	4.55	46.09		49.36
2013	30.48	20.59	51.07	4.11	46.96		50.23
Ø (2013-2017)	28.48	19.24	47.72	3.14	44.58		

Development of milk production costs in Belgium 2010–2017 (without net investments)

year	2010	2011	2012	2013	2014	2015	2016	2017*	Ø (2013-2017)
production costs in c/kg	42.88	45.66	44.15	46.96	46.09	45.20	42.12	42.53	44.58
farm gate milk prices in c/kg**	30.46	33.11	30.19	37.22	36.00	27.93	26.70	35.05	32.58
shortfall in c/kg	-12.42	-12.55	-13.96	-9.74	-10.09	-17.27	-15.42	-7.48	-12.00
shortfall in %	-29%	-27%	-32%	-21%	-22%	-38%	-37%	-18%	-27%
MMI (index, base year = 2010)***	100	106	103	110	107	105	98	99	

** Source: MMO of the EU 2018, natural fat and protein contents

*** The Milk Marker Index (MMI) reflects the development of milk production costs

Shortfall in milk production costs

The current results also serve as a basis for the calculation of the price/cost ratio. This ratio shows to which extent farm gate milk prices allow to cover production costs.

On average over the past five years, 12 cents or 27 % of milk production costs in Belgium could not be covered.



■ farm gate milk price ◆ production costs Ø = 5-year average (Ø 2013–2017)

Milk Production Costs 2017

→ Denmark



In 2017, the production costs for one kilogram of milk in Denmark were 38.74 cents, representing a slight decrease compared to the previous year. Milk prices, on the other hand, were 8.10 cents up on 2016 at 36.78 cents. Nevertheless, 5% of the producers' costs could not be covered. Over the past 10 years, between 2007 and 2016, Danish

milk producers have invested an average of 4.74 cents net. Net investments are not yet included in the final result of production costs. For dairy farms, however, these additional expenses are necessary to secure their future. The lower production costs in recent years were mainly caused by falling depreciation as a result of a lack of investment.

Overview of milk production costs in Denmark in 2017*

cost items	in cents / kg
+ bought-in feed	11.41
+ home-grown fodder (seeds, fertilizers, plant protection products, other)	1.91
+ livestock costs (veterinary costs, insemination, etc.)	3.29
+ building & machine upkeep	3.75
+ energy	1.40
+ contract work	3.48
+ wages paid	4.23
+ other indirect costs	1.26
+ rent paid	1.70
+ depreciation	4.62
+ interest and taxes	5.12
- production value of beef	-5.00
= incurred costs of milk production (only for delivered milk)	37.17
+ income variable (labour costs)	4.08
= total production costs	41.25
- subsidies	-2.51
= milk production costs	38.74
+ net investments (10-year average)	4.74
= milk production costs including net investments	43.48



Development of investments in Denmark 2007–2016 in cents/kg (based on FADN 2016)

year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Ø 10 years
gross investments	15.16	25.90	11.96	6.42	6.72	4.59	6.20	5.51	5.09	4.96	9.25
net investments (without depreciation)	11.09	21.13	7.09	1.69	1.96	0.08	1.62	0.99	0.92	0.88	4.74

Milk production costs in Denmark in cents/kg (based on FADN 2016)

year	paid costs	+ income variable	= total costs	- subsidies	= production costs	net investments + Ø (2007-2016)	costs + net investments
2017*	37.17	4.08	41.25	2.51	38.74	4.74	43.48
2016	37.77	4.08	41.85	2.51	39.34		44.08
2015	38.19	4.07	42.26	2.51	39.75		44.49
2014	42.04	4.26	46.30	3.54	42.76		47.50
2013	42.09	4.83	46.92	4.07	42.85		47.59
Ø (2013-2017)	39.45	4.26	43.72	3.03	40.69		

Development of milk production costs in Denmark 2010–2017 (without net investments)

year	2010	2011	2012	2013	2014	2015	2016	2017*	Ø (2013-2017)
production costs in c/kg	41.77	42.98	41.94	42.85	42.76	39.75	39.34	38.74	40.69
farm gate milk prices in c/kg**	31.94	35.67	34.04	38.63	39.67	31.03	28.68	36.78	34.96
shortfall in c/kg	-9.83	-7.31	-7.90	-4.22	-3.09	-8.72	-10.66	-1.96	-5.73
shortfall in %	-24%	-17%	-19%	-10%	-7%	-22%	-27%	-5%	-14%
MMI (index. base year = 2010)***	100	103	100	103	102	95	94	93	

** Source: MMO of the EU, natural fat and protein contents

*** The Milk Marker Index (MMI) reflects the development of milk production costs

Shortfall in milk production costs

The current results also serve as a basis for the calculation of the price/cost ratio. This ratio shows to which extent farm gate milk prices allow to cover production costs. On average

over the last 5 years, Danish milk producers have been short 5.73 cents or 14% to cover their costs.



■ farm gate milk price ◆ production costs Ø = 5-year average (Ø 2013–2017)



Milk Production Costs 2017

→ France

In 2017, the production costs for one kilogram of milk in France were 45.14 cents. The price of milk, on the other hand, was only 34.42 cents and in the previous year only 30.18 cents per kilogram. Even if the milk price increased by 4.24 cents from 2016 to 2017, 24 % of the costs were not covered.

On average over the past ten years, gross investments were less than depreciation and net investments were negative (-0.17 cents/kg), meaning that the physical capital of French dairy farms has decreased.

Overview of milk production costs in France in 2017*

cost items	in cents / kg
+ bought-in feed	8.42
+ home-grown fodder (seeds, fertilizers, plant protection products, other)	3.08
+ livestock costs (veterinary costs, insemination, etc.)	1.69
+ building & machine upkeep	4.21
+ energy	2.69
+ contract work	4.42
+ wages paid	0.95
+ other indirect costs	4.04
+ rent paid	2.61
+ depreciation	8.22
+ interest and taxes	1.65
- production value of beef	-6.94
= incurred costs of milk production (only for delivered milk)	35.04
+ income variable (labour costs)	14.21
= total production costs	49.25
- subsidies	-4.11
= milk production costs	45.14
+ net investments (10-year average)	-0.17
= milk production costs including net investments	44.97

Development of investments in France 2007–2016 in cents/kg (based on FADN 2016)

year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Ø 10 years
gross investments	6.60	8.16	7.04	6.20	6.44	7.34	6.78	7.66	6.13	6.70	6.91
net investments (without depreciation)	-0.13	1.04	-0.41	-0.82	-0.42	0.47	-0.85	0.56	-0.72	-0.36	-0.17

Milk production costs in France in cents/kg (based on FADN 2015)

year	paid costs	+ income variable	= total costs	- subsidies	= production costs	net investments + Ø (2007-2016)	costs + net investments
2017*	35.04	14.21	49.25	4.11	45.14		44.97
2016	34.39	14.21	48.60	4.11	44.49		44.32
2015	35.64	14.21	49.85	4.11	45.74	-0.17	45.57
2014	36.86	18.34	55.20	5.53	49.67		49.50
2013	38.26	14.56	52.82	5.94	46.88		46.71
Ø (2013-2017)	36.04	15.11	51.14	4.76	46.38		

Development of milk production costs in France 2010–2017 (without net investments)

year	2010	2011	2012	2013	2014	2015	2016	2017*	Ø (2013-2017)
production costs in c/kg	41.51	42.67	43.81	46.88	49.67	45.74	44.49	45.14	46.38
farm gate milk prices in c/kg**	31.55	33.94	32.58	35.30	37.34	32.29	30.18	34.42	33.91
shortfall in c/kg	-9.96	-8.73	-11.23	-11.58	-12.33	-13.45	-14.31	-10.72	-12.47
shortfall in %	-24%	-20%	-26%	-25%	-25%	-29%	-32%	-24%	-27%
MMI (index. base year = 2010)***	100	103	106	113	120	110	107	109	

** Source: MMO of the EU 2018, natural fat and protein contents

*** The Milk Marker Index (MMI) reflects the development of milk production costs

Shortfall in milk production costs

The current results also serve as a basis for the calculation of the price/cost ratio. This ratio shows to which extent farm gate prices allow to cover production costs. On average over

the last 5 years, 12.47 cents or 27% of milk production costs in France could not be covered.



■ farm gate milk price ◆ production costs Ø = 5-year average (Ø 2013–2017)



Milk Production Costs 2017

→ Germany

In 2017, the production costs for one kilogram of milk in Germany were 41.81 cents. Even if the milk price increased by 9.47 cents from 2016 to 2017, 11% of the costs were not covered. Over the last 10 years, between 2007 and 2016, German milk producers have invested an average of 1.58 cents net. These costs are not yet included in the milk production

costs. In response to the falling milk prices, necessary investments in means of production were almost completely reduced from 2013 to 2016 (from 3.48 to 0.19 cents net). The sharp drop in costs in 2015 was due to lower depreciation, reduced staff costs and also reduced feed costs.

Overview of milk production costs in Germany in 2017*

cost items	in cents / kg
+ bought-in feed	7.97
+ home-grown fodder (seeds, fertilizers, plant protection products, other)	2.76
+ livestock costs (veterinary costs, insemination, etc.)	3.68
+ building & machine upkeep	4.06
+ energy	3.10
+ contract work	2.59
+ wages paid	2.22
+ other indirect costs	2.11
+ rent paid	2.44
+ depreciation	5.75
+ interest and taxes	1.38
- production value of beef	-5.88
= incurred costs of milk production (only for delivered milk)	32.18
+ income variable (labour costs)	12.73
= total production costs	44.91
- subsidies	-3.10
= milk production costs	41.81
+ net investments (10-year average)	1.58
= milk production costs including net investments	43.39



Development of investments in Germany 2007–2016 in cents/kg (based on FADN 2016)

year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Ø 10 years
gross investments	7.08	7.52	5.85	6.87	8.13	7.19	9.43	6.51	5.65	4.79	6.90
net investments (without depreciation)	1.51	2.08	0.68	1.13	2.52	1.67	3.48	1.57	1.01	0.19	1.58

Milk production costs in Germany in cents/kg (based on FADN 2016)

year	paid costs	+ income variable	= total costs	- subsidies	= production costs	net investments + Ø (2007-2016)	costs + net investments
2017*	32.18	12.73	44.91	3.10	41.81	1.58	43.39
2016	32.81	12.73	45.54	3.10	42.44		44.02
2015	31.88	12.31	44.19	2.99	41.20		42.78
2014	35.36	13.30	48.66	4.27	44.39		45.97
2013	37.60	13.22	50.82	4.92	45.90		47.48
Ø (2013-2017)	33.97	12.86	46.82	3.68	43.15		

Development of milk production costs in Germany 2010–2017 (without net investments)

year	2010	2011	2012	2013	2014	2015	2016	2017*	Ø (2013-2017)
production costs in c/kg	41.44	42.05	44.08	45.90	44.39	41.20	42.44	41.81	43.15
farm gate milk prices in c/kg**	31.89	35.92	32.90	38.75	38.78	30.53	27.93	37.40	34.68
shortfall in c/kg	-9.55	-6.13	-11.18	-7.15	-5.61	-10.67	-14.51	-4.41	-8.47
shortfall in %	-23%	-15%	-25%	-16%	-13%	-26%	-34%	-11%	-20%
MMI (index. base year = 2010)***	100	101	106	110	107	99	102	101	

** Source: MMO of the EU 2018, natural fat and protein contents

*** The Milk Marker Index (MMI) reflects the development of milk production costs

Shortfall in milk production costs

The current results also serve as a basis for the calculation of the price/cost ratio. This ratio shows to which extent farm gate price allow to cover production costs. On average over

the last 5 years, 8.47 cents or 20% of milk production costs in Germany could not be covered.



■ farm gate milk price ◆ production costs Ø = 5-year average (Ø 2013–2017)

Milk Production Costs 2017



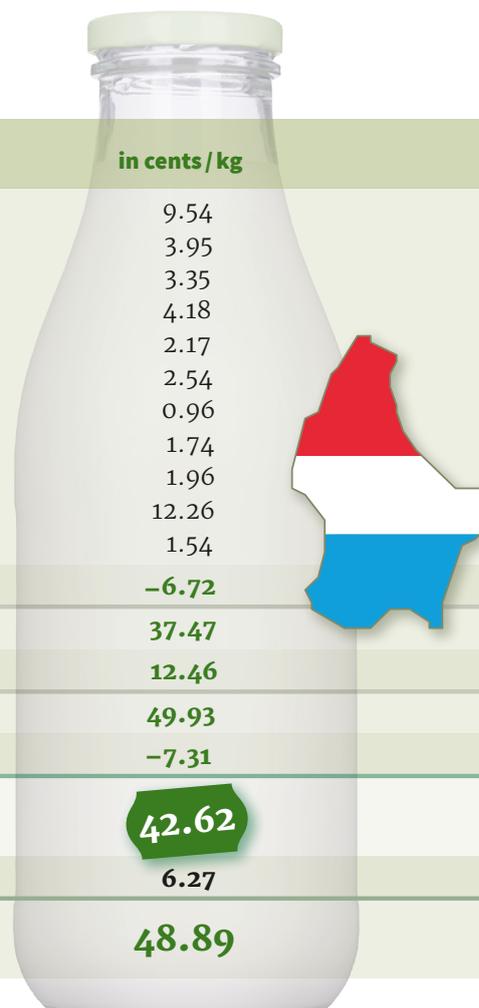
→ Luxembourg

In 2017, the production costs for one kilogram of milk in Luxembourg were 42.62 cents. Even if the milk price increased by 7.35 cents from 2016 to 2017, 18 % of the costs were not covered. Over the last 10 years, between 2007 and 2016, Luxembourg dairy farmers have invested an average of 6.27 cents net. These costs are not yet included in the

milk production costs. In response to the milk crisis, Luxembourg's milk producers have almost completely reduced their net investments by 2016. They were only about 1 cent per kilogram of milk after very high investments of almost 16 cents in 2014.

Overview of milk production costs in Luxembourg in 2017*

cost items	in cents / kg
+ bought-in feed	9.54
+ home-grown fodder (seeds, fertilizers, plant, protection products, other)	3.95
+ livestock costs (veterinary costs, insemination, etc.)	3.35
+ building & machine upkeep	4.18
+ energy	2.17
+ contract work	2.54
+ wages paid	0.96
+ other indirect costs	1.74
+ rent paid	1.96
+ depreciation	12.26
+ interest and taxes	1.54
- production value of beef	-6.72
= incurred costs of milk production (only for delivered milk)	37.47
+ income variable (labour costs)	12.46
= total production costs	49.93
- subsidies	-7.31
= milk production costs	42.62
+ net investments (10-year average)	6.27
= milk production costs including net investments	48.89



Development of investments in Luxembourg 2007–2016 in cents/kg (based on FADN 2016)

year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Ø 10 years
gross investments	19.34	14.97	13.17	12.44	17.72	23.69	23.80	27.08	13.13	5.27	17.06
net investments (without depreciation)	7.22	3.14	1.23	0.76	6.82	12.36	11.66	15.96	2.63	0.92	6.27

Milk production costs in Luxembourg in cents/kg (based on FADN 2016)

year	paid costs	+ income variable	= total costs	- subsidies	= production costs	net investments + Ø (2007-2016)	costs + net investments
2017*	37.47	12.46	49.93	7.31	42.62	6.27	48.89
2016	37.28	12.46	49.74	7.31	42.43		48.70
2015	38.16	12.42	50.58	7.64	42.94		49.21
2014	41.48	10.38	51.86	9.13	42.73		49.00
2013	41.18	11.61	52.79	9.87	42.92		49.19
Ø (2013-2017)	39.11	11.87	50.98	8.25	42.73		

Development of milk production costs in Luxembourg 2010–2017 (without net investments)

year	2010	2011	2012	2013	2014	2015	2016	2017*	Ø (2013-2017)
production costs in c/kg	39.77	40.06	41.39	42.92	42.73	42.94	42.43	42.62	42.73
farm gate milk prices in c/kg**	28.73	31.81	29.94	35.69	36.39	28.82	27.48	34.83	32.64
shortfall in c/kg	-11.04	-8.25	-11.45	-7.23	-6.34	-14.12	-14.95	-7.79	-10.09
shortfall in %	-28%	-21%	-28%	-17%	-15%	-33%	-35%	-18%	-24%
MMI (index. base year = 2010)***	100	101	104	108	107	108	107	107	

** Source: SER Luxembourg, calculated by the BAL on the basis of milk prices with natural fat and protein contents
 *** The Milk Marker Index (MMI) reflects the development of milk production costs

Shortfall in milk production costs

The current results also serve as a basis for the calculation of the price/cost ratio. This ratio shows to which extent farm gate prices allow to cover production costs. On average over

the last 5 years, 10.09 cents or 24% of milk production costs in Luxembourg could not be covered.



■ farm gate milk price ◆ production costs Ø = 5-year average (Ø 2013–2017)

Milk Production Costs 2017



→ The Netherlands

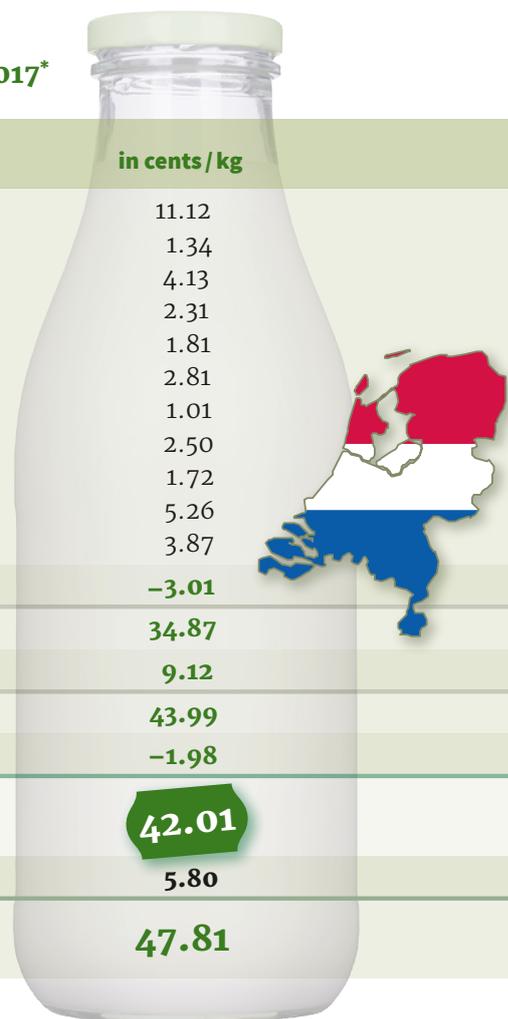
In 2017, the production costs for one kilogram of milk in the Netherlands were 42.01 cents. Even if the milk price increased by 6.7 cents from 2016 to 2017, 16% of the costs were not covered. Over the last 10 years, between 2007 and 2016, Dutch milk producers invested an average of 5.80 cents net. These costs are not yet included in the milk production costs. In response to the falling milk prices, necessary investments in means of production were cut back sharply

from 2015 to 2016 (-5.62 cents net). This resulted in falling depreciation and the corresponding reduction in production costs since 2015.

In the calculated cost of production, the effects on the short and long term of the phosphate reduction programme are not included yet. They will be included as soon as the costs related to this programme have been published.

Overview of milk production costs in the Netherlands in 2017*

cost items	in cents / kg
+ bought-in feed	11.12
+ home-grown fodder (seeds, fertilizers, plant protection products, other)	1.34
+ livestock costs (veterinary costs, insemination, etc.)	4.13
+ building & machine upkeep	2.31
+ energy	1.81
+ contract work	2.81
+ wages paid	1.01
+ other indirect costs	2.50
+ rent paid	1.72
+ depreciation	5.26
+ interest and taxes	3.87
- production value of beef	-3.01
= incurred costs of milk production (only for delivered milk)	34.87
+ income variable (labour costs)	9.12
= total production costs	43.99
- subsidies	-1.98
= milk production costs	42.01
+ net investments (10-year average)	5.80
= milk production costs including net investments	47.81



Development of investments in the Netherlands 2007–2016 in cents/kg (based on FADN 2016)

year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Ø 10 years
gross investments	8.07	12.83	12.47	9.56	10.85	12.84	10.99	13.77	12.26	6.43	11.01
net investments (without depreciation)	3.72	8.02	7.29	4.15	5.22	7.21	5.28	8.38	7.15	1.53	5.80

Milk production costs in the Netherlands in cents/kg (based on FADN 2016)

year	paid costs	+ income variable	= total costs	- subsidies	= production costs	net investments + Ø (2007-2016)	costs + net investments
2017*	34.87	9.12	43.99	1.98	42.01	5.80	47.81
2016	34.93	9.12	44.05	1.98	42.07		47.87
2015	35.32	9.31	44.63	2.17	42.46		48.26
2014	38.73	9.85	48.58	2.11	46.47		52.27
2013	37.30	9.88	47.18	2.61	44.57		50.37
Ø (2013-2017)	36.23	9.46	45.69	2.17	43.52		

Development of milk production costs in the Netherlands 2010–2017 (without net investments)

year	2010	2011	2012	2013	2014	2015	2016	2017*	Ø (2013-2017)
production costs in c/kg	39.96	43.05	42.96	44.57	46.47	42.46	42.07	42.01	43.52
farm gate milk prices in c/kg**	30.75	34.22	32.38	37.40	38.90	30.75	28.75	35.45	34.25
shortfall in c/kg	-9.21	-8.83	-10.58	-7.17	-7.57	-11.71	-13.32	-6.56	-9.27
shortfall in %	-23%	-21%	-25%	-16%	-16%	-28%	-32%	-16%	-21%
MMI (index. base year = 2010)***	100	108	108	112	116	106	105	105	

3 Source: MMO of the EU 2018, natural fat and protein contents

4 The Milk Marker Index (MMI) reflects the development of milk production costs

Shortfall in milk production costs

The current results also serve as a basis for the calculation of the price/cost ratio. This ratio shows to which extent farm gate milk prices allow to cover production costs.

On average over the last five years, 9.27 cents or 21% of milk production costs in the Netherlands could not be covered.



■ farm gate milk price ◆ production costs Ø = 5-year average (Ø 2013–2017)



Cost study – methodology and data

The data used for the cost calculations is universally applicable. It is official accounting data for specialised dairy farms included in the surveys carried out by the EU Farm Accountancy Data Network (FADN). This data is collected and verified by national liaison agencies (usually research institutes of the country's Ministry of Agriculture) and then forwarded to the European Commission.

The FADN and the sample of agricultural holdings on which it is based is the only representative data source that provides economic and structural figures about commercial agricultural holdings. The calculations commissioned by the EMB are based on the same sources also used by the EU for their agronomic analyses.

The sample holdings included in the FADN are chosen so as to provide a representative picture of the real economic structures of dairy farms. In addition to farm structural characteristics (number of employees, area, herd size, livestock units, etc.), the FADN also includes important figures from the farms' profit and loss statements. Thus, all key variables from specific and non-specific costs are available and are considered in the cost calculations (see *Overview 1. p. 28/29*).

The used data is only representative for commercial specialised dairy farms. This means that the evaluation consciously excludes smaller mixed farms focused on milk production as well as part-time farms.

Timely and regular – the need for information on current costs

The availability of timely, regularly-updated data and cross-cutting analyses on cost developments is very important to the dairy farmer associations in the EMB. Only with this kind of information would it be possible for them to take appropriate action at the agro-political level, rather than reacting too late. This information is becoming

increasingly important for active farms to be able to orient their production strategies to the economic reality. If they are part of a producer organisation, this information can help them demand appropriate prices when negotiating with milk buyers.

Knowledge about production costs is also a fundamental requirement from a business point of view. Furthermore, it must also be possible to base price negotiations on actual costs. However, this is where a major issue lies: dairies and farmers usually do not decide on prices in advance. For dairy farmers, it is almost impossible to negotiate a price that is actually based on production costs with a dairy. They are ultimately paid whatever processing facilities can spare. If supply outstrips demand and dairies see their revenues shrink, dairy farmers end up bearing the brunt of these losses. It is also difficult for milk producers to control supply because there are no overarching, common market mechanisms in place.

The EU also publishes data about the cost situation on a yearly basis. The EU Dairy Farms Report published by the European Commission provides information about the EU milk production countries based on FADN data. These analyses serve as an important tool for political institutions in their decision-making as well as strategy development. However, they represent a major shortcoming in terms of timeliness of data. The latest EU report from 2016 is only an evaluation of accounting data from 2013 and provides a very limited analysis of trends in milk production costs that stops at 2014 (European Commission 2016)¹. Considering the highly-volatile developments on the dairy market, these statistical conclusions are therefore outdated. They have very little to do with the current economic reality on dairy farms.

Extrapolating production costs to 2017

The EU accounting data in its current form is not enough to provide a real-time cost overview. Until 2016, data was only available for a period dating back three years. While the EU has started providing preliminary data for a more recent period as of this year (in 2018 for the accounting year 2016), this still does not allow for an up-to-date representation of costs.

In order to provide a timely as well as regularly-updated cost calculation, the BAL has developed an extrapolation methodology (analogue methodology). It is based on the

price indices regularly published by Eurostat for the key agricultural inputs in milk production. This includes seeds, fertilizers, plant protection products, bought-in feed, machine and equipment maintenance as well as energy and revenue from beef production. The extrapolation does not simply add or subtract the current price differences. It, in fact, mathematically simulates how dairy farms have modified their spending due to price changes by looking at similar price situations from the past.

The labour cost of milk production – sufficient recognition is the need of the day

Being a dairy farmer today is a demanding task. Not only does this profession require specialised knowledge about animal rearing, farming and fodder cultivation, as well as maintenance of highly technical and sensitive machines and equipment; business management skills are also necessary to be able to run a dairy farm. This profession also comes with the responsibility of producing high-quality milk for consumers and other users. Furthermore, the necessary constant care for animals is very labour-intensive.

Technical cost studies deal with the reporting of labour costs in milk production in very different ways. There are different approaches to the valuation of labour. However, the chosen methods often do not represent an appropriate benchmark from the point of view of milk producers. The

value of labour is usually assigned using a generic standard for an hour of work that, nonetheless, does not consider qualifications or actual field of work at all. For example, the European Commission equates the value of an hour of work by a self-employed dairy farmer with that of external labour hired to work on the farm, and thus calculates the farm's spending in terms of wages and imputed labour costs. However, there is no differentiation between the kind of employment and level of qualification (e.g. seasonal workers, temporary help for simple tasks, etc.) nor field of work. As a result, past experiences have shown that the imputed labour costs in recent years have not even been in line with the minimum wage.

¹ European Commission 2016. EU Dairy farms report based on FADN 2013

The majority of dairy farms are family-run and the required work is carried out by family members. Therefore, it is important to determine an appropriate benchmark to decide on the value of the work done by them. The labour costs of self-employed dairy farmers are determined in the EMB cost calculation using an independent income variable. The nationally-applicable collective agreements (agricultural sector) are used as a reference and benchmark to determine the value of an hour of work carried out by the farm manager and the contributing family

members. Employer contributions are also included in the income variable because dairy farmers would have to bear these social costs if they were to hire someone instead. Such collective agreements lend themselves perfectly to such a differentiated valuation of labour costs on farms on the basis of qualifications and area of responsibility. Not only is the implemented methodology recognised, it also represents standards for the valuation of labour adopted collectively by self-employed farmers in their role as employers with employees.

Table 7: Reference systems on appropriate monetary valuation of work done by family members on family-owned dairy farms

Country	Reference system ²
Belgium	Wage categories chosen according to the qualifications of the farm manager and family workers, based on the basic wage set by the Auxiliary Joint Committee for Employees, CP 200, classes B and D.
Denmark	National collective agreements in the agricultural sector: wage group for managerial functions (farm manager) as well as basic wage for workers (family labour)
France	1.5-times the legal minimum wage (<i>SMIC – salaire minimum interprofessionnel de croissance</i>). The calculation of working time in the present study is based on the results of a representative study on working time in dairy farms, conducted and published by IDELE France.
Germany	Collective agreements in the agricultural sector in the different Länder: wage group for managerial functions (farm manager) as well as basic wage for workers (family labour).
Luxembourg	Based on the social minimum wage in Luxembourg. The hourly rate for a higher wage group (wage group 6 for an agricultural master) is determined on the basis of the Baden-Württemberg agricultural collective agreement.
Netherlands	System of job valuation based on market information about the rate of remuneration of agricultural employees (employers' association).

How many hours does it take to run a dairy farm?

To answer this question, no appropriate recording of working time is actually available. Therefore, the cost calculations have stuck to the standards set by FADN and the national farm accountancy networks (see Table 8).

These set working hours are not derived from real recordings of working times. They are usually based on the nationally-agreed working time per Family Work Unit (FWU).

The reference system chosen by the European Commission provides a very different number of working hours from country to country as the basis to calculate labour costs. A direct comparison of labour costs between countries is, therefore, not possible. The number of working hours set for

French dairy farmers, in particular, is significantly below that of the other EU countries because the collectively-agreed working time of 35 hours per week is the norm. A family worker in the agricultural sector in France is only assigned about 1.500 hours per year. Therefore, in the French cost calculation the data on working time is based on a study conducted by IDELE France.

The cost calculations of BAL assume that the farm manager is a full-time employee on the dairy farm. The additional working hours are assigned to family workers. Calculated using the outlined base rates, the derived hourly wages are presented in Table 9. These hourly rates are the basis

² You can find detailed information about this calculation in the national cost reports at: <http://www.europeanmilkboard.org/milk-production-costs.html>.

for the calculation of the income variable and are eventually converted to a rate per kilogram of produced milk (see results).

FADN records the number of working hours for the farm as a whole. Therefore, the cost study of BAL only considers the percentage of labour costs that result from milk production (see *Overview 1*, p. 28/29). The considered percentage is, at the end of the day, dependent on the different degrees of dairy farm specialisation in the six countries.

One of the tasks for the future shall be to engage in a constructive discussion with the European Commission and develop more realistic valuation methodologies for the number of working hours and value of the work done by self-employed dairy farmers. Cow herds require all-round care throughout the year. In every country, family members running their own farms contribute to the running of their business on a daily basis.

Table 8: Working hours of family workers on family-owned dairy farms determined by the European Commission

Country	Number of family workers recorded in FADN 2016 (in FAWU) ³	Total hours of work set for all FAWU	Set number of work hours per FAWU (total hours/FAWU)
Belgium	1.73	4,611	2,666
Denmark	1.21	2,640	2,182
France	1.63	2,612	1,602
Germany	1.45	3,419	2,358
Luxembourg	1.55	3,415	2,203
Netherlands	1.54	3,622	2,352

Table 9: Working hours and income variables used in the BAL cost calculations 2016/2017

Country	Hours by farm manager	Hours by family workers	Imputed income variable/hour	Income variable in cents/kg	Percentage of income from milk production
Belgium	2,666	1,946	€ 22.05	17.54	87%
Denmark	2,182	458	€ 29.82	4.08	83%
France	- Ø for both: 3,493 -		€ 22.17	14.21	73%
Germany	2,358	1,061	€ 16.46–22.11 (according to federal state rate)	12.73	55–80% (according to federal state rate)
Luxembourg	2,203	1,212	€ 26.38	12.46	69%
Netherlands	2,352	1,270	€ 22.89	9.12	86%

Overview 1: Diagram for reporting of milk production costs adjustments to FADN/EU

Cost heading

Specific costs

Bought-in feed for grazing livestock (1)

Home-grown fodder
— Seeds
— Fertilizers
— Plant protection products
— Other specific forage production costs

Other specific livestock costs (veterinary costs, etc.)

Non-specific costs

— Building + machine upkeep
— Energy
— Contract work
— Other direct costs
— Taxes and other dues

Wages paid, rent paid, interest paid

Depreciation

Family labour costs

Subsidies

Land/capital costs

Allocation

Specific costs

Percentage of dairy cows + cattle/ grazing livestock (2)

Percentage of dairy cows + cattle/ grazing livestock



Percentage of area used for fodder crops/total area (2)

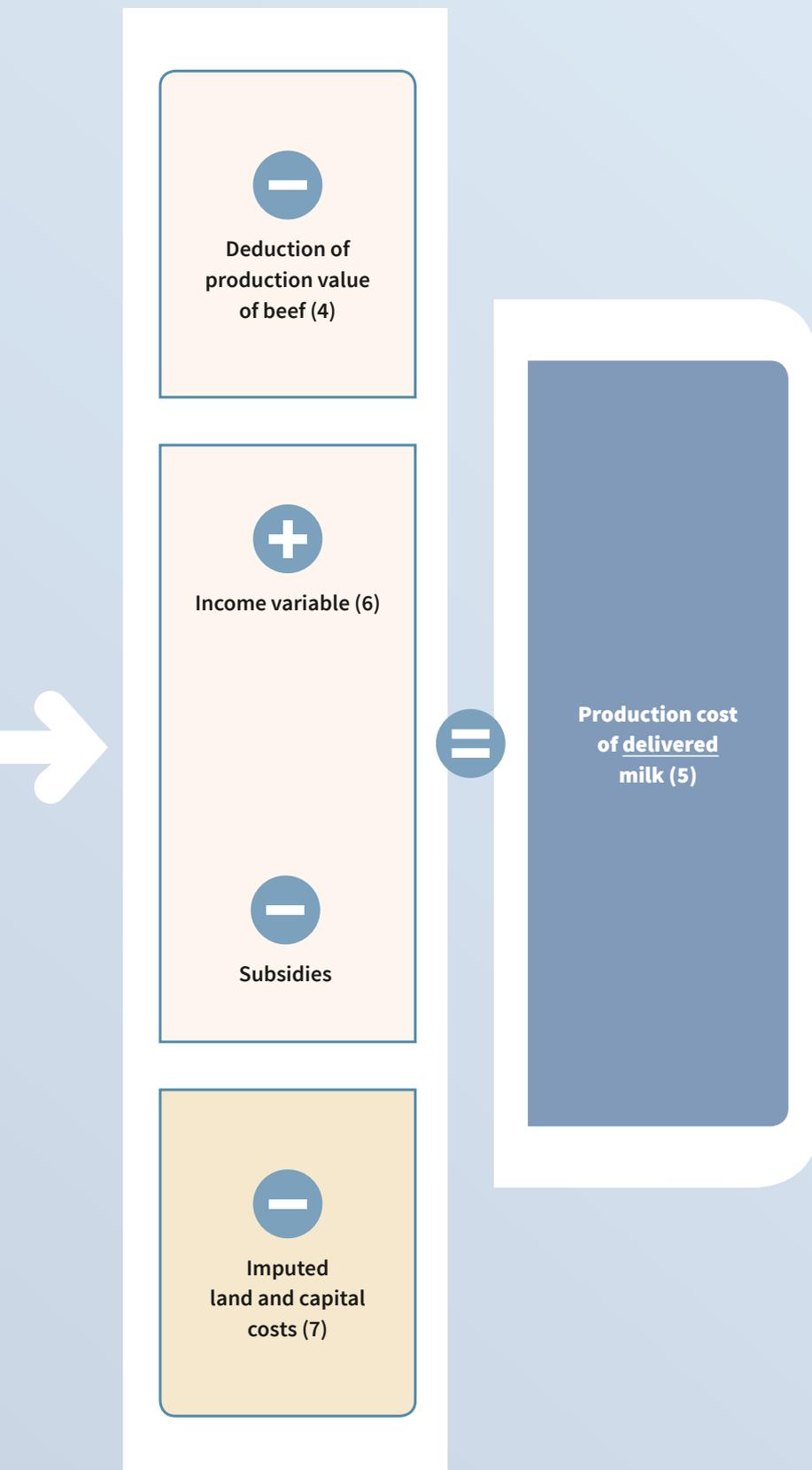
Percentage of dairy cows + cattle/ total livestock units (2)

Non-specific costs

Production value of milk + beef/ Total production value minus farm use (3)

Production value of milk/ Total production value minus farm use (3)





Adjustments/Legend

- 1: The cost of bought-in feed is derived from the total costs for grazing livestock. The EU uses individual figures.
- 2: The allocation of costs for bought-in feed and home-grown fodder as well as other specific livestock costs refer to all cattle on the farm. The EU refers to the number of dairy cows.
- 3: The allocation for these cost groups is derived by dividing the production value of milk (and beef) by the total production value minus farm use. The EU also includes milk subsidies and total subsidies in this allocation, but does not include beef.
- 4: The EU system does not deduct complementary revenue from the co-product beef.
- 5: The costs are calculated for delivered milk and not the farm's total milk production (as is done by the EU).
- 6: Income variable: in the present study, an independent variable was used to calculate the labour costs of self-employed farmers.
- 7: The imputed land and capital costs are indicated separately from total milk production costs.

Overview of publications on milk production costs in Europe

Country	Calculation status	Type of publication	Languages available
General overview			
	2017	Overview of milk production costs in six European countries – second edition	EN
	2016	Overview of milk production costs in five European countries	EN
Belgium			
	2016	Update of the study on milk production costs in Belgium	DE, FR
	2016	Short version of the study	DE, FR
	2016	Data sheet of the study	DE, EN, FR
	2014	Study on milk production costs in Belgium	DE, FR
	2014	Short version of the study	FR, NL
Denmark			
	2016 (forthcoming)	Data sheet on milk production costs in Denmark	DE, EN, FR
	2015	Data sheet on milk production costs in Denmark	DE, EN, FR
	2014	Data sheet on milk production costs in Denmark	DE, EN, FR
France			
	2016–2017	Update of the study on milk production costs in France (on the basis of FADN 2015)	DE, FR
	2013	Study on milk production costs in France (on the basis of FADN 2009)	DE, FR
	2013	Short version of the study	FR

Country	Calculation status	Type of publication	Languages available
Germany			
	October 2017	Data sheet on milk production costs in Germany	DE, EN, FR
	July 2017	Data sheet on milk production costs in Germany	DE, EN, FR
	April 2017	Data sheet on milk production costs in Germany	DE, EN, FR
	January 2017	Data sheet on milk production costs in Germany	DE, EN, FR
	October 2016	Data sheet on milk production costs in Germany	DE, EN, FR
	July 2016	Data sheet on milk production costs in Germany	DE, EN, FR
	April 2016	Data sheet on milk production costs in Germany	DE, EN, FR
	January 2016	Data sheet on milk production costs in Germany	DE, EN, FR
	2017	Update of the study on milk production costs in Germany (on the basis of FADN 2016)	DE
	2016	Update of the study on milk production costs in Germany (on the basis of FADN 2014/2015)	DE
	2015	Update of the study on milk production costs in Germany (on the basis of FADN 2013)	DE
	2014	Update of the study on milk production costs in Germany (on the basis of FADN 2012)	DE
	2012	Study on milk production costs in Germany (on the basis of FADN 2009)	DE, EN, FR
	2012	Short version of the study	DE, EN, FR
Luxembourg			
	2015	Study on milk production costs in Luxembourg	DE
	2015	Short version of the study	DE
Netherlands			
	July 2017 (forthcoming)	Data sheet on milk production costs in the Netherlands	DE, EN, FR
	2016 (forthcoming)	Data sheet on milk production costs in the Netherlands	DE, EN, FR
	2015	Data sheet on milk production costs in the Netherlands	DE, EN, FR
	2014	Data sheet on milk production costs in the Netherlands	DE, EN, FR
	2013	Study on milk production costs in the Netherlands	DE, NL

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