

What is the cost of producing milk?

Calculation of the milk production costs in Germany for the years 2002 to 2012

Report based on the scientific survey "Calculation of the costs for producing milk based on the data of the Farm Accountancy Data Network of the EU) (FADN)"

on behalf of the MEG Milch Board w. V. association and the European Milk Board (EMB)

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1 Starting point

If you want to negotiate, you need to know your costs. Knowing the costs is also necessary if the farming population is to be provided with an appropriate means of subsistence (appropriate per capita income), to quote one of the goals of the EU's Common Agricultural Policy. Is the price of a product good? Is an income appropriate? These questions can only be answered by knowing the costs that have been incurred and the expenditure involved in producing a good or service.

The EU Milk Package gives EU-wide recognition to producer organisations (such as the MEG Milch Board) who act on behalf of their members in the milk sector to conclude contracts with the buyers and thus negotiate the prices¹. Furthermore, the new regulation includes the option of introducing compulsory contracts between producers and dairies at national level.²

The current discussion about the Common Agricultural Policy features important instruments for observing the agricultural markets in order to make them more transparent.

In future therefore, far greater significance will be attributed to the enhanced transparency and collective negotiation of milk prices in the European member states. This results for both milk producers and their organisations in the need to have a cost calculation for milk production available in future to provide them with a sound, professionally recognised basis for price negotiations in order to obtain a fairer distribution of the risks between milk producers and processors.³ The political sector needs reliable data for realistic assessments as to whether farming incomes are really appropriate. This is the only way for them to implement measures that support farmers.

Future costing should take account of both regional and international aspects. For example, on the one hand it should be possible to differentiate milk costs according to the region and to the farm structures. On the other hand, it is also beneficial to have comparable data on an EU-wide level as the milk market has long exceeded national frontiers. Another important parameter in the production of a good or service consists in the income entitlement of the self-employed farmer, thus taking account of the work s/he has invested. Cost analysis also has to take due account of this factor.

Existing instruments for calculating milk costs, such as production branch analysis, only offer limited suitability for these new tasks, as they have been developed and are used for other objectives. The German Federal Cartel Office (*Bundeskartellamt*) has suggested that the costs should be calculated on a differential basis according to regions and farm size, with separate itemisation of the imputed (unpaid) costs.

One major aspect therefore entails answering questions such as: which data material should be used when calculating the costs of milk production? For which farm types and sizes can the costs be defined? How can costs be differentiated on a regional basis and calculated using the latest possible costs of milk production? Are the costs calculated in such a way as to permit comparison between the regions and European member states? How can such calculations take adequate consideration of the work performed by farm managers and family members?

The answers to these questions have to be found by the MEG Milch Board w.V. together with the producer organisations from 14 European countries combined in the EMB.

This is why at the end of 2011, the MEG Milch Board w. V. and the European Milk Board instructed the *Büro für Agrarsoziologie und Landwirtschaft* (BAL, Agricultural Sociology Office) to produce a scientific survey including the elaboration of an autonomous concept for calculating the current costs of producing milk, in line with the objectives of the MEG Milch Board and the EMB.

¹ Article 126 a - c in Regulation 262/2012 dated 20 March 2012 to amend Regulation 1234/2007 on contractual relations in the milk sector

² Article 185 f, *ibid.* See annotation 1

³ See also the opinion of the German Raiffeisen Association on the interim report of the milk sector study dated 25 February 2010, page 7 and page 15, quoted according to the Federal Cartel Office (2012), p. 71 et seq.

In doing so, the MEG Milch Board and EMB stipulated the following requirements on the method for calculating the costs for producing milk:

The method should:

1. be based on representative data;
2. offer the best possible depiction of the actual situation of milk production and the related costs;
3. provide a sound calculation for the costs of producing milk which can be updated regularly in order to negotiate milk prices in Germany, with regional differentiation;
4. develop a procedure to permit calculation of milk production costs in Germany and other EU countries and their regions in order to compare the production costs in dairy farming between the EU states.

The basis for calculating milk production costs in Germany was developed in close cooperation between the Büro für Agrarsoziologie und Landwirtschaft (BAL) and the Milk Production Costs joint working group of the MEG Milch Board and EMB. In consultation with this working group, the main work and development steps were adopted, according to which:

- the calculation method for analysing milk production costs would be based on the data of the Farm Accountancy Data Network (FADN) of the Directorate-General for Agriculture and rural development of the European Commission (DG Agri) and that this scheme should be adapted to the objectives of the survey;
- in addition, an individual parameter (income rate) should be elaborated for ascertaining the level of income entitlement of self-employed farmers as an important component of the production costs;
- on this basis the production costs for milk in Germany can be calculated for the years 2002 to 2009;
- moreover, a forecasting method should be developed for accurate estimation of the current milk production costs in Germany in 2012.

2 The database

The European Farm Accountancy Data Network (FADN)

The European Farm Accountancy Data Network (FADN) has been taken as the source of data for the survey. Every year, this data network collects the accountancy data of farms based in the EU member states (for more details, please refer to the following box "What is the FADN"?). According to the European Commission, 80,000 full-time ("commercial") farms are covered by the FADN sampling procedures every year. This represents a total number of about 5,000,000 farms in the 25 EU member states, who work more than 90% of the total utilised agricultural area (UAA), generating more than 90% of total agricultural production in the EU.⁴

The FADN database was chosen in the framework of this survey for the following reasons:

- This is a database which is officially and formally recognised by the member states of the EU and refers to a joint European legal basis.
- The FADN uses farm accountancy data generated according to the same accountancy principles in all EU countries. The FADN therefore constitutes a harmonised source of micro-economic data.
- In contrast to the annual full-cost calculations of the agricultural departments in the German federal states, the FADN supplies representative data for full-time farms.
- Using the FADN as calculation basis offers the possibility of comparing milk production costs between EU countries.

On the basis of the FADN accountancy results, the Directorate-General for Agriculture and rural development of the EU Commission regularly calculates the costs and profits involved in milk production in a comparison of

⁴ cf. FADN (2010), p. 5. However, the claim of being representative is only conditionally acceptable, as the FADN procedure is not a random sample from all the farms in the EU and the surveys are based on a stratified selection of "commercial" farms.

the EU member states.⁵ The results of these studies and the calculation methods are published regularly in the EU Dairy Farms Report. However, this report does not contain any specific results for the German federal states, nor for different farm sizes.

It was therefore necessary to proceed with some own calculations based on the FADN data in order to obtain the desired differentiation according to region and farm size. This was carried out with reference to the method used in the EU Dairy Farms Report 2010 for calculating the milk production costs. However, the method had to be adapted to a certain extent in the interests of precise calculation with regard to the German situation (see chapter 3).

What is the FADN?

Every year the FADN collects the accountancy data of farms based in the EU member states. The European Commission uses the FADN as an instrument for evaluating agricultural policy decisions, for example when evaluating farm incomes in the context of the Common Agricultural Policy.

The data collated in the FADN are put together by the member states of the European Union. Every EU member state involved in the FADN data network has a national agency (liaison agencies) responsible for data collection. They coordinate the surveys for the FADN; every year they collect the accountancy data from a sample of the farms with accountancy based in the European Union. This is based on the national surveys carried out by the member states with regard to the financial situation of their farms. Accordingly, the German data used in this survey revert to the data of the test farm accountancy collected by the Federal Ministry of Food, Agriculture and Consumer Protection (BMELV) and entered in the FADN data network by the responsible agencies (BMELV, since 2012 the Johann Heinrich von Thünen Institute (vTI) in Braunschweig).

The accountancy data are accessible to the public and can be downloaded in summarised form from the website <http://ec.europa.eu/agriculture/rica>. This website also includes a description of the FADN concept and principles together with the legal principles of its establishment and organisation. The legal principles are based on Regulation No. 79/65/EEC dated 1965, with a list of corresponding legislation published under <http://eur-lex.europa.eu/de/legis/latest/chap0330.htm>.

The EU has set up the "Circa" internet portal (www.circa.eu) to provide public access to the standard results of the FADN data collections. Standard results means that the accountancy results from the surveys are published by the EU as processed, standardised data. This refers to averaged values from certain groups of farms rather than the data of individual farms. However, what counts for the planned calculations of milk production costs is that the data are processed in line with the dimensions shown in overview 1:

Overview 1: Dimensions of the processed FADN data and study goals

Dimensions/criteria	Study goal
1. Year	Calculation of the milk production costs for the years 2002-2009 and projection of the costs for 2012 (see chapter 5)
2. Country	Access to the data for Germany
3. Area (FADN areas):	Differentiation and evaluation of the data according to the federal states
4. Economic size (in ESU)	Differentiation and evaluation of the data according to economic farm sizes
5. Type of farm (TF)	Full-time/commercial farms specialising in dairy farming

⁵ The Directorate-General for Agriculture and rural development of the European Union uses the FADN to conduct on-going studies of the cost of milk production. The latest milk cost studies published by the FADN refers to the years 2003, 2008, 2010 and 2011.

The regions

The FADN differentiates the data for Germany according to federal states. This survey has ascertained the production costs for milk in all German federal states apart from the city states.

The farms

The FADN only collects the data from full-time farms in the European Union with a certain minimum economic size. The minimum size is calculated in European Size Units (ESU) (see following box on "Minimum farm sizes"). There is no separate group for farms run as partnerships: they are contained in the group of commercial farms.

Minimum farm sizes in the FADN

The data surveys in the FADN are restricted to commercial farms and partnerships from a minimum economic size. This minimum size is expressed in European Size Units (ESU). The EU draws the line for this minimum size at the point where in its opinion the farm "is large enough to provide a main activity for the farmer and a level of income sufficient to support his or her family". In view of the differing farm structures in the European Union, the member states use ESU to define the specific separate minimum sizes according to which the farms are chosen for the survey. In turn, the minimum size is defined by the standard gross margin (SGM).⁶ The data includes only farms with accountancy. Compared to a sample including commercial and sideline farms, distortions are therefore possible both in ascertaining the income and also with regard to the production costs of the farms.⁷

Accordingly, this study refers solely to the calculation of the costs for producing milk in commercial dairy farms from an economic size of 16 ESU (threshold value for the years 2002 to 2009); this corresponds to a standard gross margin of at least 19,200 Euro for this period of time.

The FADN classifies the farm sizes based on European Size Units (ESU) using the so-called economic size grouping (ES grouping). The survey was based on the accountancy data for six different farm size classes (referred to as ES6 grouping in the FADN). Overview 2 shows these six farm size classes.

Overview 2: Farm size classes as per FADN

ES6 grouping	Description	Size in ESU
1	Very small	< 4 ESU
2	Small	< 8 ESU
3	Lower median	8 - < 16 ESU
4	Upper median	16 - < 40 ESU
5	Large	< 100 ESU
6	Very large	>= 100 ESU

As indicated above, the minimum economic size from which specialised commercial German farms are included in the sample is 16 ESU. For this reason, the current survey only shows the production costs for dairy farms in the economic size classes 4 (upper median 16 to less than 40 ESU) to very large (more than 100 ESU). In other

⁶ The standard gross margin (SGM) per unit of area or livestock is defined as the value of yield per hectare or production animal after deducting the corresponding variable special costs. The standard gross margin is used as the basis for ascertaining the economic size of the farms (expressed in European Size Units (ESU). 1 ESU corresponds to a certain amount in Euro of the gross margin (from 2002 to 2009, 1 ESU = 1,200 Euro standard gross margin).

⁷ cf. also Rebernick, Bernhard (2006)

words, the following calculation does not take account of dairy farms belonging to the lower median and to the small or very small farms.

The FADN summarises the data of the farms into so-called TF groups according to their type of farming. The survey was based on data summarising the specialised dairy farms in the TF8 group. This includes both specialised dairy farms and specialised dairy farms with cattle breeding. The common denominator is that milk production accounts for at least two thirds of the standard gross margin.⁸ This is a justifiable limitation: according to Eurostat figures (2011), 73% of all dairy farms in the FADN sample for Germany in 2007 were classified as "specialist milk " in the TF8 group. In turn, these farms had 75% of all dairy cows in Germany.⁹

The cost calculations are based on the TF8 grouping of specialised dairy farms (with or without cattle breeding). Mixed livestock farms with an economic focus on cattle breeding, forage crops and grazing livestock (suckler cows) are therefore not featured in this survey.

⁸ According to the FADN, "specialist milk production" covers farms where milk production accounts for altogether more than two thirds of the standard gross margin.

⁹ cf. Eurostat (2011): p. 14

3 Calculating the "paid" costs of milk production in Germany

How have the costs of milk production been calculated in this survey? Basically, it was possible to adopt the method used by the European Commission in the EU Dairy Farms Report (as of 2010) for calculating the costs and profits of European milk production, based on the FADN accountancy results, but with the following adaptations:

The FADN accountancy results and therefore also the production costs are ascertained for the whole farm and thus refer to all production branches together. It is therefore necessary to use a calculation scheme to ascertain the production costs for milk which separates the share of costs incurred by the farms for milk production. Between 1997 and 2010, the Directorate-General for Agriculture and rural development of the EU gradually changed and adapted its calculation scheme. In the earlier studies of the EU Dairy Farms Report (1997-2003), the EU focus was restricted primarily to calculating the actual production costs including depreciation and external costs (wages, interest, rental charges). These are the "paid"¹⁰ costs of milk production. The more recent EU study in 2010 included the imputed ("unpaid") costs for the work of the self-employed farmers, land and capital in the calculation scheme.

For this survey, the scheme allocating the individual cost items to the milk production branch was changed.

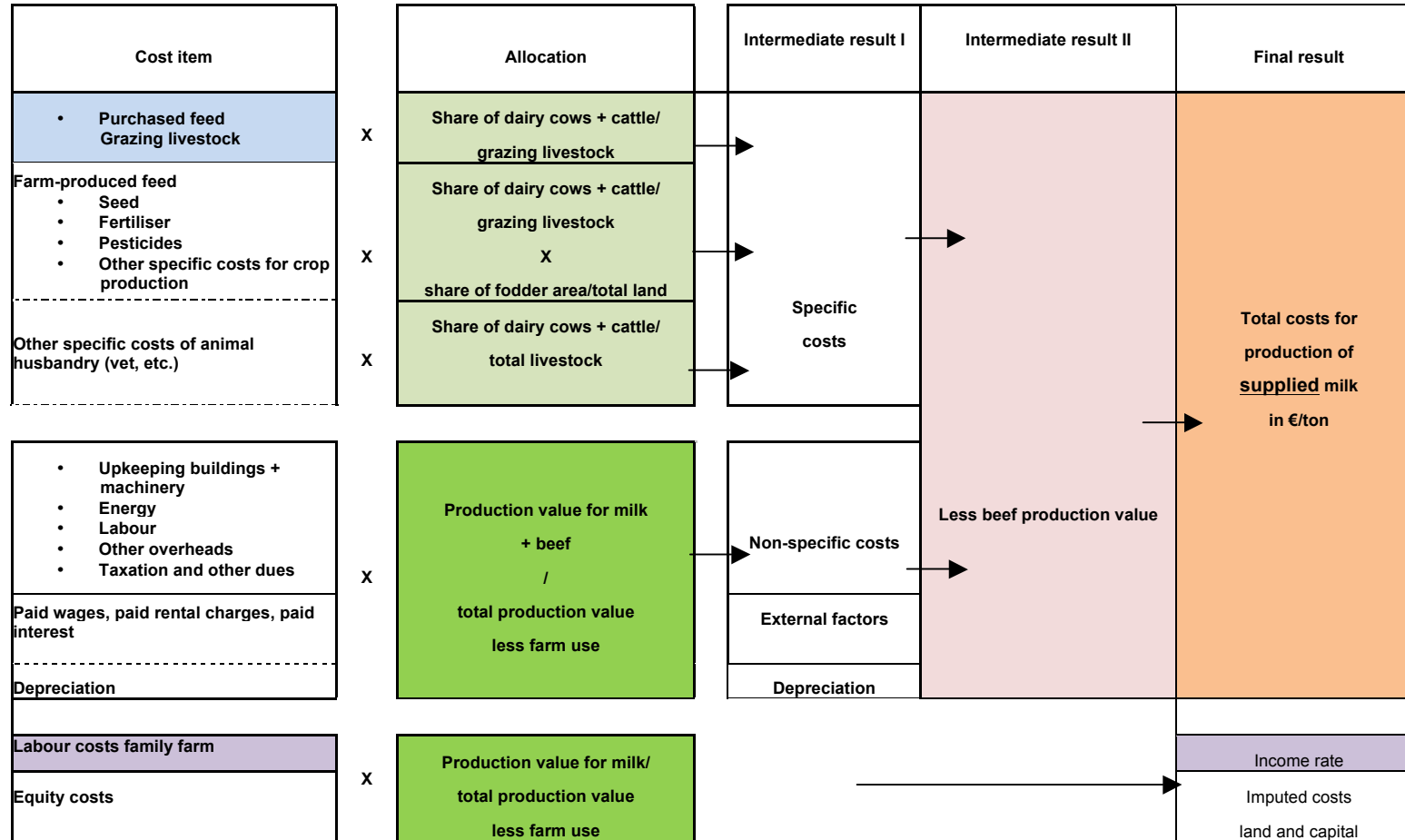
1. Instead of the dairy cows and a calculated share for other cattle (a defined share of heifers which the EU scheme groups together with the dairy cows in "dairy livestock units"), the cost calculation includes all dairy cows and all other cattle. In this case, the proceeds from cattle production are deducted from the total costs again in a second step.
2. The calculations refer to the "paid" production costs. The imputed costs for land and capital (rental charges and interest) are ascertained according to the EU calculation scheme, but itemised individually to obtain a clear separation between income statement and budget projection.
3. In contrast to the EU concept, farm use of milk is deducted and the costs of production refer to the delivered milk.
4. The EU offsets the subsidies in the cost calculation; this survey on the other hand has itemised the subsidies as income. This gives due transparency to the different subsidy levels in the federal states and between farm sizes so that these can be deducted from the ascertained production costs. This survey also works with an individual income rate that is more appropriate to the self-employed work of the farmers. The EU calculation scheme ascertains the labour costs using a wage rate.

The following overview 3 shows the calculation scheme used in the framework of this survey; the legend summarises the essential adaptations of the survey's calculation concept in comparison to the EU calculation scheme.

These adaptations are then described and justified in greater detail on the following pages.

¹⁰ "Paid" costs = costs caused by real outgoing cash flows. English studies also often distinguish between "paid" and "unpaid" production costs.

Overview 3: Adapted EU scheme for calculating milk production costs based on the FADN



Adaptations:

- 1: Costs for purchased feeding stuffs are ascertained from the total costs for grazing livestock. The EU uses individual data.
- 2: The allocation of these three cost groups refers to all cattle in the farm. The EU uses dairy livestock units
- 3: The allocation of these two cost groups is based on the production value of milk and beef, which is divided by the total production value minus farm use. The EU also includes milk subsidies and total subsidies in this allocation, but not beef.
- 4: The EU concept does not deduct the additional revenues of the co-product beef.
- 5: The costs for the farm are calculated for the supplied milk, not for the total milk produced (as with the EU).
- Income rate:** This report takes its own approach to calculating the labour costs for self-employed farmers.

3.1 Detailed description and justification for adapting the EU calculation scheme

Adaptation 1: Cost item "purchased feeding stuffs"

In the framework of this survey, the costs for purchased feed are ascertained by subtracting the costs of farm-produced feed for grazing livestock from the total costs of feed for grazing livestock.

The following two variables are used to this end:

1. Feed for grazing livestock (variable SE310)¹¹ and
2. Farm-produced feed for grazing livestock (variable SE315)

The survey had to revert to this calculation method as the individual variables used in the EU calculation scheme for the cost of purchased grazing livestock feed, concentrated feed and non-forage crops were not available in the public data used for the calculations in the framework of this survey. The EU calculation scheme uses these individual variables to calculate the costs for purchased feed; that was not possible in this survey.

This approach results in the following restriction: the costs calculated for purchased feed also include the costs for using common grazing land, agistment and the costs of renting forage land.

Adaptation 2 + Adaptation 3: Allocation of specific costs, non-specific costs, external costs and depreciation

The EU calculation scheme uses so-called "dairy livestock units" in allocating the four cost blocks for specific costs, non-specific costs, external costs and depreciation. Dairy livestock units correspond to the number of dairy cows plus a calculated share of breeding heifers plus the female young cattle (in LU). The share of breeding heifers and female cattle is calculated from the ratio of dairy cows to all cows in the farm (dairy cows + cull cows + other cows).

In contrast to the EU calculation scheme, this survey includes all cattle as co-products in cost allocation (see overviews 4 and 5).¹²

- The EU calculation scheme presumes that all cattle¹³ are fed in the same way, whether dairy cows, calves, young cattle or breeding heifers. This may be appropriate in many EU member states with relatively extensive dairy farming. However, in Germany intensive use is made of concentrated feed. Using this calculation method for the situation in Germany would produce distorted results.
- Using "dairy livestock units" for cost allocation excludes a share of those costs which are necessarily incurred in the production of milk (co-products) while not being directly allocated to the dairy cows. These costs include the costs for calves and cattle rearing in order to supplement stocks from the farm's own operations, or for example the costs for old cows and breeding bulls. However, the EU calculation scheme based on the share of dairy livestock units to grazing livestock essentially excludes the costs for by-/co-products involved in milk production.
- The fact that a large share of the associated costs necessarily incurred in producing the main product milk is not taken into account is of particular significance, as the sample consists only of specialised dairy farms from a size of 16 ESU (Germany). Compared to a calculation model that includes the co-products of milk production, the EU calculation scheme therefore results in lower production costs.¹⁴

¹¹ A detailed definition of the variables used in the survey is to be found in Commission Regulation (EC) No. 868/2008 of 3 September 2008 from the Official Journal of the European Union, L 237/18 of 4 September 2008 and in the definition of variables in the FADN standard results of the Community Committee of the FADN 2007.

¹² Throughout the survey, costing is checked using a simple cost and revenue accounting (credited market value), with the survey results also being compared with those of the EU (for 2008). The credited market value excludes the specific allocation of cost items to the dairy production branch described above. A comparison of the EU calculation scheme with the scheme presented in this chapter shows that the results are very close.

¹³ The FADN uses livestock units (LU) to define animal numbers. Grazing livestock = all other cattle such as calves, young cattle and bulls, together with goats and sheep.

¹⁴ cf. Rebernick, Bernhard (2006)

Overview 4: Adapted allocation of specific costs

Allocation of specific costs	
With the EU calculation scheme	In this survey
1. Purchased feed for milk production is calculated by multiplication with the percentage share of	
<ul style="list-style-type: none"> "dairy livestock units" to all other grazing livestock on the farm (all other cattle such as calves, young cattle and bulls, together with goats and sheep). 	<ul style="list-style-type: none"> dairy cows and all other cattle to all grazing livestock.
2. The costs for farm production of forage (seed, fertiliser, pesticides) for milk production are calculated by multiplication with the percentage share of	
<ul style="list-style-type: none"> dairy livestock units to all other grazing livestock, multiplied with the percentage share of the fodder area to the total area. 	<ul style="list-style-type: none"> dairy cows and all cattle to all grazing stock, multiplied with the percentage share of the fodder area to the total area.
3. The other specific costs of animal husbandry are multiplied with the percentage share of	
<ul style="list-style-type: none"> "dairy livestock units" to the total livestock 	<ul style="list-style-type: none"> dairy cows and all other cattle to the total livestock.

By including all other cattle ("Other cattle LU", FADN variable SE090) in the calculation, they are taken into account as co-products of milk production and the costs for their generation are initially included in the production costs.

Adaptation 3: Changing the allocation of non-specific costs, depreciation and external factors, subsidies not offset

Logically, beef as co-product is also taken into account in allocating the non-specific costs, depreciation and external factors.

This is done by taking account of the production value for beef (variable SE220) when calculating the share of non-specific costs, depreciation and external factors in the costs of milk production.

Furthermore, in contrast to the EU calculation scheme, the allocation of these cost items is done without offsetting the subsidies. In the EU calculation scheme, the allocation of these cost items combines the production values for milk with the subsidies for milk and total production with the related total subsidies.

The procedure used in the EU calculation scheme is justified with the goal of being better able to compare the development of costs and profits in milk production from 2004 to 2009. Another argument is that part of the milk subsidies used to be included in the price and today is allocated directly to the farms. It is also said that the costs of milk production in farms also focusing on cattle fattening should be estimated with greater accuracy. These are contained in the EU sample (Dairy Farms Report 2010) and, according to the EU arguments, these are farms for which direct subsidies have become increasingly significant in the years under review.

However, these arguments are not relevant for this survey because of the decoupling consistently introduced in Germany, and because the calculations refer solely to the specialised dairy farms.

The survey therefore calculates as shown in overview 5.

Overview 5: Allocation of non-specific costs, depreciation and external factors

With the EU calculation scheme	In this survey
Allocation of the non-specific costs, depreciation and external factors by multiplication with the percentage share of	
<ul style="list-style-type: none"> the production value for milk and the subsidies for milk to the share of the total production value plus the total subsidies. <p>Farm use of crop production is deducted from the total production and the costs for purchasing breeding animals (to replace livestock) are added to avoid double booking of these cost items.</p>	<ul style="list-style-type: none"> the production value for milk and beef to the share of the total production value, less farm use of crop production. <p>Subsidies are viewed as income and itemised separately.</p>

The method used here includes the costs for internal stock replacement (cattle purchase) completely in the calculation (see above, including feed as co-product, deduction of additional revenues with beef). The value of the super-levy is included in the standard results of the FADN in taxes and other dues (variable SE390) and thus featured in the cost group of non-specific costs. The available database does not permit any separation of these two cost items.

Adaptation 4: Deduction of the additional revenues for the co-product beef

In a further step, the additional revenues (production value for beef in FADN) generated on the dairy farm on the basis of these co-products are deducted from the ascertained total of the specific costs, non-specific costs and the external factors and depreciation.

Why deduct the additional revenues from beef production?

Surveys on the costs of milk production differ in their approach to including/excluding the additional revenues of beef production.

In this context, Hemme (2010) distinguishes between the two cost indicators of full costs per kg milk or milk production costs per kg milk. A calculation of the full costs of milk production consists exclusively in calculating all expenditure directly attributable to milk production and excludes the expenditure for all other cattle. The milk production costs by contrast take account of co-production. "Only the cost indicator for milk production permits calculation of the milk price that is necessary to cover the costs of milk production when taking account of all additional revenues".¹⁵

Tietjen (2004)¹⁶ also refers to the problem of co-products respectively associated costs of milk production in calculating the production costs for specialised dairy farms, which can be solved using the residual value method¹⁷.

Many of the milk production cost surveys conducted specially on the basis of the FADN data in all the different EU countries do tend to take differing approaches to handling the additional revenues for beef production.¹⁸

In the EU Dairy Farms Report, the allocation schemes for calculating the costs of milk production are drawn up with the objective of making it at all possible to compare the production costs of milk between European member states and accession states (e.g. between EU 10, EU 25, EU 2). This is why dairy farms with a low level of specialisation (from 50% dairy livestock contribution to the standard gross margin) are included in the sample (e.g. mixed livestock farms, milk/beef fattening farms, forage crop and grazing livestock farms). Similarly to the suggestion made by Tietjen, the modified approach used by the authors of this survey deducts

¹⁵ cf. Hemme, Torsten (2010), Hemme, Torsten (2009): p. 18 and Giffhorn, Deeken (2000).

¹⁶ cf. also: Tietjen, Armin (2004): p. 15

¹⁷ The residual value method is an acknowledged method for calculating costs in production processes resulting in both main and co-products. The revenues of the co-product (beef in this case) are deducted from the costs of the main product (milk in this case). This method is also called cost crediting for main products, cf. Reichard (2001): p. 25 and Coenberg (2007).

¹⁸ cf. Rama, D., Keane, M. (1993): Production costs for milk in European countries. Franco Angeli Publishing. Rome

the revenues generated by the sale of beef from the total costs of cattle husbandry in order to calculate the production costs for specialised dairy farms.

Adaptation 5: Calculating the costs for the supplied milk only

The EU calculation scheme calculates the costs for all the milk produced on the farm. To this end, the milk yield of the farm in milk equivalents¹⁹ per dairy cow is multiplied by the average number of cows kept on the farm. The milk production of the farm calculated in this way includes on-farm consumption and farm use as animal feed. Farm use of the milk as animal feed is not itemised as a separate value in the FADN. The EU calculation scheme therefore refers the costs ascertained for milk production to the total milk produced, and not to the delivered, sold milk.

This is why a correction factor has been defined for this production cost calculation in order to convert the amount of produced milk to the quantity of delivered milk. The correction factor was defined with reference to the test farm accounting of the BMELV ministry. This is possible because the accounting results of the FADN for Germany refer directly to these data surveys. The data of the BMELV test farm network feature both the milk yield and also the effective milk reference quantity of the farms. It was thus possible to define an average conversion factor of 0.97 in order to obtain the quantity of delivered milk.²⁰

3.2 Calculating an income rate based on standard wages for the agricultural sector

This survey uses an individual income rate to calculate the labour costs of family workers (farm manager assisted by members of the family) which are to be added to the milk production costs.

The EU calculation scheme calculates the labour costs for self-employed farmers and their family members (referred to as "imputed unpaid family factor costs") on the basis of values for average regional wages "which the owner of the farm would have to pay if he were to hire employees to do the work carried out the family members".²¹ To ascertain the labour costs of unremunerated family workers, the values for the regional wages are multiplied with the hours worked by all family members according to the FADN standard results. The hours worked are defined as the working time of the unremunerated family workers (standardised in the FADN as family annual work unit – Family AWU), based on a maximum of 3,000 hours. The qualification of the farm manager is attributed higher remuneration based on the defined working time than to the employed worker used as reference. In calculating the labour costs of self-employed farmers, the EU Dairy Farms Report does not use an income rate that corresponds to their professional qualification or functions and tasks as farm manager.

Note: The EU Dairy Farms Report 2010 argues that the presumed maximum of 3,000 hours "corresponds more or less to the time that can be spent on a farm by farmers milking cows". Accordingly, only the working time of the self-employed family workers corresponding to the pure milking time is acknowledged as costs of milk production. In the end, this approach is justified with arguments that question the farmers' professional right to exist as soon as they continue farming under poorly paid conditions respectively below the regional wage level of farm workers. The farm is then classified as a "way of life", or it is presumed that the farm benefits from off-farm income generated by other members of the family.

But farmers are self-employed. Like others working on a self-employed basis, they are defined by the fact that they generate income rather than receiving a wage or salary. The income they generate by their self-employed work covers the costs of their farming business, while the remaining income from their self-employed work is used to pay income tax and serves as a livelihood. In calculation terms, it is therefore only possible in

¹⁹ Swiss Federal Office for Agriculture (2011): 2011 Agriculture Report (Switzerland): according to the FADN method, one milk equivalent equals 73 g protein or fat, i.e. one kg of average milk with a content of 33 g protein and 40 g fat. The milk equivalent serves as a unit for calculating the quantity of milk processed in a dairy product.

²⁰ Data sources: www.bmelv-statistik.de, here: Buchführungsergebnisse Landwirtschaft. Die wirtschaftliche Lage der landwirtschaftlichen Betriebe. Various years.

²¹ EU Commission (2010), Dairy Farms Report, p. 62.

retrospect (ideally with the financial statement, after the income tax declaration) to say how much or how little income is generated by the self-employed work.

As a result, when calculating the current costs of agricultural production and negotiating prices for the agricultural product, the necessary income can therefore only be estimated.

The income rate used in this survey reverts to the agreed standard wage groups in the agricultural sector as alternative income for calculating the labour costs of self-employed farmers assisted by their family members. As the function of an employed farm manager is approximately comparable with the self-employed manager of a full-time family farm, the cost calculations are based on the agreed standard wage groups for employed managers and workers in the East German federal states.

Choice of collectively agreed wage groups

The income rate was calculated on the basis of two wage groups (defined in collective wage agreements) valid for 2011. The current working hours for 2011 are not available, so that the working hours registered by the FADN for 2009 were taken instead. The reference wages were based on the standard wages negotiated in the federal state of Saxony for self-employed farmers in the function as farm manager (standard wage for farm managers in the agricultural sector in wage group 9, monthly wage of €3,332 (valid from 1 November 2011); up until 2010, the net standard wage in this wage class was €3,257).²²

Wage group 5 (€2,298 net) is used for the helping family members (workers with training and professional experience of more than one year).

In order to use these values as the income rate for self-employed farmers, the employee contributions to health, care, pension and unemployment insurance were added, together with the statutory employee surcharge.

In line with common collective bargaining practice, a surcharge of 10% was added to the chosen standard rates when using the income rate for West German federal states.

Converting the collectively agreed standard wage to the working time of unpaid family workers registered in the FADN as family annual work units (FAWU).

The collective bargaining agreements on the agricultural sector in Germany refer to a 40-hour week with an annual leave entitlement of 23 days (corresponding to three weeks, this is the lowest standard agreed leave entitlement). Over 52 weeks a year, deduction of the three weeks leave results in 49 weeks; for 40 working hours per week, this results in altogether 1,960 hours of standard annual working time.

The working hours of the unpaid family workers on the farm are taken from the FADN as working hours of the family annual work units (Family – AWU) (FADN variable SE016). In the FADN, 1 Family AWU corresponds to one full-time worker. The farm manager is said to be 1 FAWU. The working time that can be attributed to the farm manager is calculated by dividing the total working time of all FAWU in the farm by the number of all FAWU on the farm (variable SE016/SE015).

The remaining share of the FAWU (- 1 FAWU for the farm manager) corresponds to the working time of the helping family workers.

The working time of the helping family workers is calculated by deducting the share of working hours of the farm manager (1 FAWU) from the total working hours of all FAWU.

²² Based on wage group 9, reference state Saxony, valid from 2011: "Managing activities and those demanding broad or in-depth technical/specialist know-how, performed independently with full responsibility, comprehensive leadership and management powers, proposed wage group corresponds to wage group 6 (master farmer) in Baden-Württemberg with six years of professional experience. An overview of the values of negotiated wage groups in the agricultural sector can be found in the WSI-Tarifarchiv (collective bargaining archives), as of: September 2011. As a rule, wage group 5 is the basic wage rate (training + 1 year professional experience).

The income rate for the dairy farm obtained in this way was then allocated proportionally to the milk production costs by multiplying it with the share of the milk yield to total yield after deducting farm use; this is then converted into Euros per ton of delivered milk.

Income rate: why use this individual rate to calculate the labour costs of self-employed farmers?

When calculating the current costs of agricultural production and negotiating prices for the agricultural product, the necessary income can only be estimated.

Conventional studies to ascertain the costs of milk production use the following method to define the level of imputed income for self-employed workers:

- Wage rate
- Wage claim
- Factor costs for unpaid workers
- Entrepreneur's salary

The wage rate, for example, ascertains the imputed presumed income of the self-employed ("unremunerated labour") based on fictitious wages or a presumed "minimum pay". In doing so, the farm manager function is evaluated with a flat-rate allowance calculated on the basis of the financial value of the farm.²³ The "minimum pay" of the other family workers is evaluated according to the standard pay of a farm labourer.²⁴ In doing so, only 90% of the value for "unremunerated family labour" is taken for self-employed workers in Germany's new federal states.²⁵

- The production branch analyses according to the DLG (Deutsche Landwirtschafts-Gesellschaft) scheme use monthly wages of farm labourers including employer social security contributions as comparison values. The managerial activity of the self-employed farmers is taken into account by means of a flat-rate allowance added to the employee wage.
- In turn, the IFCN Dairy Research Centre ascertains the costs of "family labour" based on the number of hours worked, evaluated at the regional wage rate (e.g. €15/hour) for a qualified worker.²⁶
- The full-cost calculations of milk production in the scheme of the European Dairy Farmers (EDF) presumes an average income as comparative value for ascertaining the income of the family workers. This amounts to 50% of the average income in the respective national industrial and services sector (according to EUROSTAT).

These methods are not suitable for this survey whose objective is to calculate the production costs for milk for pricing purposes. The definitions alone (wage rate, wage claim) conceal the clear structural differences between those working for a wage or salary, and self-employed workers. Moreover, the methods for estimating the presumed imputed labour costs do not take account of the fact that the self-employed usually have to proceed with pricing procedures for their products and services. The expression "factor costs" (for labour) clearly illustrates the discrepancies in view of the actual circumstances. For self-employed workers, their own labour is certainly not a factor that can be combined with other factors (land, machinery, equipment, financial resources) by a third party (an investor, for example) with the aim of producing products or providing services. It is simply the starting point for their business activity.

²³ The financial value is a standard value based on the size and area of the farm, including among others the fiscal evaluation of the agricultural property.

²⁴ Wille, Steffi et.al. (2009): Vollkosten nicht ganz gedeckt. DLG communications, No. 8. p. 81

²⁵ cf. BMELV (2011): Methodische Erläuterungen und Definitionen der Kennzahlen für die Buchführungsergebnisse der land- und forstwirtschaftlichen Testbetriebe. p. 6-7

²⁶ Hemme, Torsten (1999): Ein Konzept zur international vergleichenden Analyse von Politik- und Technikfolgen in der Landwirtschaft. Dissertation. Georg August University Göttingen. p. 75

3.3 Calculating the imputed costs for land and capital

In principle, the imputed costs for land and capital have been calculated using the scheme of the EU concept.

The imputed costs for land (i.e. the contributed owned area in UAA) were calculated by multiplying the average paid rent (variable SE375) itemised for the dairy farms registered in the FADN, with the utilised agricultural owned area in hectares. The owned area of the farms had to be ascertained in advance by deducting the value for rented land (in hectares, variable SE030) from the total utilised agricultural area in hectares (variable SE025).

The imputed costs for own capital (without land) were obtained by multiplying the value registered in the FADN for average farm capital (variable SE510) with the calculated real interest rate. This was obtained from the difference between the long-term interest rate of the European Central Bank (ECB) and the rate of inflation.

The imputed costs for land and capital were calculated for 2009. The calculation used the long-term interest rates for government bonds published by the European Central Bank for 2009 together with the values for the rate of inflation published by Eurostat (in principal the EU uses the interest rates published by "Global Insight", using the interest rates of the ECB for only isolated variables).²⁷

This approach results in the following restrictions:

- The rental charges for the owned area of the farm were calculated using FADN variable SE375 "Rent paid". The variable also includes rent paid for farm buildings and for the milk quota. These values cannot be isolated from the data record.
- The FADN variable SE025 "total utilised agricultural area" (UAA) also includes values for share-farmed land that cannot be isolated out of the variables by deducting variable SE030 "Rented U.A.A.". But share-farmed land has no significance for Germany.

The obtained values for the imputed land and capital costs were allocated to the percentage share of the milk yield/to the total yield after deducting farm use and then converted into Euros per ton of delivered milk (see overview 4).

The imputed costs for land and capital were calculated just for 2009.

3.4 Itemising the share of subsidies separately as income

This survey does not include subsidies directly in the cost calculation but itemises them separately as income per ton of produced milk.

The calculation includes the following subsidies relevant to the production of milk:

- Subsidies for dairying (contains special subsidies for milk production and for other cattle products)
- Non-specific subsidies for intermediate consumption, external factors
- Investment allowances
- Compensatory allowances
- Decoupled area payment.

The share of respective subsidies that can be allocated to the cost of milk production is calculated by multiplying the subsidies with the percentage share of the milk production value in the total production value after deducting farm use.

By contrast, the EU calculation scheme includes the subsidies in the cost calculation by means of an allocation scheme that uses the proportional non-specific costs, external factors and depreciation together with proportional imputed costs (land, capital, wage rate).

²⁷ Source: <http://www.ecb.int/stats/money/long/html/index.en.html>

4 Interim results: Milk production costs in Germany from 2002 to 2009

Tables 1 to 13 show the milk production costs for 2002 to 2009 in every federal state with a comparison of the production costs for each of the farm size classes 4, 5 and 6, summarising the average values for small, medium and large commercial farms.

Please note: Statistical constraints mean that it was not possible to include the milk production costs for all three farm size classes 4, 5 and 6 in every single federal state because there was not an adequately large number of farms in the sample for a representative calculation.²⁸ Tables 1 to 13 show the

- "paid" production costs
- and the income rate for each of the farm size classes in the federal states.

These two items together are itemised as total costs for the production of milk in Euros per ton.

In a second step, the total costs for the production of milk are shown for every farm size in Euros per ton after deducting the subsidies.

The imputed costs for land and capital are shown in the two right-hand columns. The tables are organised into three regions: North Germany, South Germany and East Germany.

4.1 Interim results for South Germany

Baden-Württemberg

As far as Baden-Württemberg is concerned, it was possible to calculate the milk production costs for the period from 2002 to 2009 for all three farm size classes 4, 5 and 6. These farm size classes correspond to farms with an average of about 20, 40 or 80 and more dairy cows.

In Baden-Württemberg, the paid production costs for milk in the smallest farm size class 4 ranged from 29.4 cents per kg milk in 2002 to 34.9 cents in 2009, in class 5 from 27.9 cents (2005) to 35.3 cents (2008) and in class 6 from 26.6 cents (2005) to 34.4 cents (2008).

In 2009, the paid milk production costs in the three farm size classes ranged from 30.7 to 34.9 cents per kg milk.

The clear difference in the total costs for milk production after deducting the subsidies (between 71.9 cents in farm size class 4 and 45.9 cents in class 5 and 36.6 cents in class 6) results from the great difference in labour costs for the work involved.

Bavaria

For Bavaria it was also possible to calculate the milk production costs for the period from 2002 to 2009 for all three farm size classes 4, 5 and 6. These farm size classes correspond to farms with an average of about 20, 40 or 70 and more dairy cows.

In Bavaria, the paid production costs for milk are very close together in all farm size classes. They ranged from the smallest farm size class 4 with 26.0 cents per kg milk in 2005 to 31.1 cents in 2008, in class 5 from 27.2 cents (2005) to 31.4 cents (2008) and in class 6 from 27.5 cents (2005) to 32.8 cents (2008).

In 2009, the paid milk production costs in the three farm size classes ranged from 29.3 to 30.9 cents per kg milk.

The clear difference in the total costs for milk production after deducting the subsidies (between 64.2 cents in farm size class 4 and 43.4 cents in class 5 and 37.6 cents in class 6) results here again from the differing labour costs for the work involved (see column: income rate).

²⁸ However, the calculation of the milk production costs for 2012 refers just to the results for farm size classes 5 and 6.

Table 1: Milk production costs Baden-Württemberg 2002 – 2009

Year	Farm size class (ESU)	Dairy cows (LU)	Milk yield (t)	Paid production costs in €/ton	Income rate in €/ton	Total production costs in €/ton	Subsidies in €/ton	Total production costs less subsidies in €/ton	Imputed costs (€/ton)	
									Land	Capital
Baden-Württemberg	2002 (4) 16 - <40 ESU	22	5285	293.91			40.53		20.00	29.25
	2002 (5) 40 - <100 ESU	39	5813	303.84			38.93		14.61	29.15
	2002 (6) >= 100 ESU	83	6709	292.84			39.24		7.16	22.49
	2003 (4) 16 - <40 ESU	22	5168	299.57			43.28		19.65	28.99
	2003 (5) 40 - <100 ESU	42	5974	304.77			36.53		15.05	27.98
	2003 (6) >= 100 ESU	83	6936	290.27			39.90		4.41	21.47
	2004 (4) 16 - <40 ESU	22	5227	298.19			49.94		19.95	28.38
	2004 (5) 40 - <100 ESU	45	6260	292.22			43.51		10.89	25.90
	2004 (6) >= 100 ESU	98	6505	276.52			43.91		4.28	20.39
	2005 (4) 16 - <40 ESU	22	4975	306.16			62.00		19.74	28.23
	2005 (5) 40 - <100 ESU	45	6029	279.30			51.06		11.89	25.77
	2005 (6) >= 100 ESU	92	6842	265.58			47.76		4.32	18.99
	2006 (4) 16 - <40 ESU	22	5121	307.06			71.30		16.21	26.16
	2006 (5) 40 - <100 ESU	48	6392	291.05			57.92		10.80	25.40
	2006 (6) >= 100 ESU	96	6995	267.07			52.94		4.69	18.87
	2007 (4) 16 - <40 ESU	22	4992	328.63			68.10		18.78	27.02
	2007 (5) 40 - <100 ESU	47	6127	334.46			60.48		11.53	27.40
	2007 (6) >= 100 ESU	92	6796	317.26			56.38		6.25	21.64
	2008 (4) 16 - <40 ESU	22	5136	346.03			67.37		16.94	27.19
	2008 (5) 40 - <100 ESU	48	6040	352.60			63.65		9.99	27.58
2008 (6) >= 100 ESU	96	6896	344.39			57.33		4.83	23.84	
2009 (4) 16 - <40 ESU	22	5295	349.49	444.14	793.62	74.38	719.24	18.79	27.94	
2009 (5) 40 - <100 ESU	45	6223	314.78	205.96	520.74	61.57	459.17	11.20	24.95	
2009 (6) >= 100 ESU	103	6953	307.33	116.93	424.25	58.09	366.17	3.66	20.80	

Table 2: Milk production costs Bavaria 2002 – 2009

Year	Farm size class (ESU)	Dairy cows (LU)	Milk yield (t)	Paid production costs in €/ton	Income rate in €/ton	Total production costs in €/ton	Subsidies in €/ton	Total production costs less subsidies in €/ton	Imputed costs (€/ton)	
									Land	Capital
Bavaria	2002 (4) 16 - <40 ESU	21	5774	275.59			34.26		21.71	28.48
	2002 (5) 40 - <100 ESU	36	6044	290.92			46.77		16.43	28.28
	2002 (6) >= 100 ESU	70	6322	311.33			61.00		9.28	27.64
	2003 (4) 16 - <40 ESU	21	5870	279.75			36.16		21.74	27.71
	2003 (5) 40 - <100 ESU	37	6147	294.18			50.61		15.13	27.32
	2003 (6) >= 100 ESU	69	6530	317.58			61.14		8.89	28.92
	2004 (4) 16 - <40 ESU	22	6012	270.92			44.80		20.54	25.78
	2004 (5) 40 - <100 ESU	40	6268	289.66			56.74		13.79	26.65
	2004 (6) >= 100 ESU	72	6832	287.95			62.75		7.14	25.42
	2005 (4) 16 - <40 ESU	22	6016	260.22			50.42		19.13	24.58
	2005 (5) 40 - <100 ESU	41	6376	272.35			57.70		12.76	25.62
	2005 (6) >= 100 ESU	71	6785	275.30			60.40		6.68	23.35
	2006 (4) 16 - <40 ESU	22	6234	273.57			62.81		19.20	24.37
	2006 (5) 40 - <100 ESU	41	6530	281.98			66.88		12.04	25.44
	2006 (6) >= 100 ESU	75	6694	287.03			63.82		7.45	22.13
	2007 (4) 16 - <40 ESU	22	6059	301.67			63.10		20.61	26.04
	2007 (5) 40 - <100 ESU	42	6497	309.62			67.99		12.53	26.49
	2007 (6) >= 100 ESU	75	6532	325.02			68.35		7.67	25.13
	2008 (4) 16 - <40 ESU	22	6080	310.85			65.77		20.19	24.93
	2008 (5) 40 - <100 ESU	43	6653	313.74			66.89		10.93	25.76
2008 (6) >= 100 ESU	76	6727	328.58			63.08		6.54	24.58	
2009 (4) 16 - <40 ESU	21	6087	293.30	417.53	710.84	69.16	641.68	19.02	24.83	
2009 (5) 40 - <100 ESU	43	6620	299.19	203.63	502.82	68.73	434.10	10.34	25.06	
2009 (6) >= 100 ESU	81	6844	309.86	129.53	439.39	63.13	376.27	6.47	23.65	

Hesse

For Hesse it was possible to calculate the milk production costs for the period from 2002 to 2009 for all three farm size classes 4, 5 and 6. These farm size classes correspond to farms with an average of about 20, 40 or 70 and more dairy cows. In this state, the paid production costs for milk are very close together in all farm size classes. They ranged from the smallest farm size class 4 with 29.3 cents per kg milk in 2004 to 38.0 cents in 2008, in class 5 from 28.6 cents (2005) to 34.2 cents (2007) and in class 6 from 27.9 cents (2005) to 34.1 cents (2007).

In 2009, the paid milk production costs in the three farm size classes ranged from 31.1 to 35.9 cents per kg milk.

The differences in the total costs for milk production after deducting the subsidies (between 72.4 cents in farm size class 4 and 44.1 cents in class 5 and 33.7 cents in class 6) result here again from the differing labour costs for the work involved.

Rhineland-Palatinate

For Rhineland-Palatinate, it was possible to calculate the milk production costs for the period from 2002 to 2009 for three farm size classes (4, 5 and 6, with the exception of 2003 and 2004 with two classes) (see table 4). These farm size classes correspond to farms with an average of about 20, 45 or 90 and more dairy cows.

In Rhineland-Palatinate, the paid production costs for milk in the smallest farm size class 4 ranged from 35.2 cents per kg milk in 2005 to 41.3 cents in 2008, in class 5 from 27.7 cents (2005) to 32.7 cents (2007) and in class 6 from 26.7 cents (2005) to 32.2 cents (2007).

In 2009, the paid milk production costs in the three farm size classes ranged from 37.6 to 27.7 cents per kg milk. The clear differences in the total costs for milk production after deducting the subsidies (between 75.5 cents in farm size class 4 and 40.7 cents in class 5 and 33.4 cents in class 6) result here again from the differing labour costs for the work involved.

Table 3: Milk production costs for Hesse 2002 – 2009

Year	Farm size class (ESU)	Dairy cows (LU)	Milk yield (t)	Paid production costs in €/ton	Income rate in €/ton	Total production costs in €/ton	Subsidies in €/ton	Total production costs less subsidies in €/ton	Imputed costs (€/ton)	
									Land	Capital
Hesse	2002 (5) 40 - <100 ESU	35	5965	319.39			51.30		10.21	24.32
	2002 (6) >= 100 ESU	84	7007	305.73			39.82		6.38	20.71
	2003 (4) 16 - <40 ESU	17	5228	329.04			65.13		23.27	25.84
	2003 (5) 40 - <100 ESU	35	6013	320.98			50.79		9.37	24.14
	2003 (6) >= 100 ESU	81	7128	304.47			41.51		5.02	20.26
	2004 (4) 16 - <40 ESU	21	5736	293.31			59.08		12.27	20.68
	2004 (5) 40 - <100 ESU	46	6419	295.18			55.76		7.85	22.96
	2004 (6) >= 100 ESU	91	6993	294.63			55.93		4.55	19.41
	2005 (4) 16 - <40 ESU	20	6026	299.03			70.63		10.78	20.91
	2005 (5) 40 - <100 ESU	45	6530	285.76			63.86		7.19	22.00
	2005 (6) >= 100 ESU	93	6898	278.74			57.68		4.58	18.63
	2006 (4) 16 - <40 ESU	20	5931	315.27			87.74		11.91	20.88
	2006 (5) 40 - <100 ESU	48	6579	303.53			71.50		7.96	21.63
	2006 (6) >= 100 ESU	96	7348	293.45			63.08		4.58	17.93
	2007 (4) 16 - <40 ESU	21	5983	366.81			87.40		10.64	20.66
	2007 (5) 40 - <100 ESU	49	6586	341.94			78.33		8.52	23.01
	2007 (6) >= 100 ESU	103	7295	341.19			66.30		4.20	19.72
	2008 (4) 16 - <40 ESU	20	5719	380.30			89.47		12.12	22.55
	2008 (5) 40 - <100 ESU	49	6731	333.86			72.81		7.81	22.78
	2008 (6) >= 100 ESU	99	7436	327.25			63.05		4.05	19.57
2009 (4) 16 - <40 ESU	19	5782	359.30	467.53	826.83	102.44	724.39	12.42	20.95	
2009 (5) 40 - <100 ESU	49	6649	318.16	203.97	522.13	80.81	441.32	6.91	23.48	
2009 (6) >= 100 ESU	98	7460	311.03	97.90	408.93	72.33	336.60	3.41	20.54	

Table 4: Milk production costs in Rhineland-Palatinate 2002 – 2009

Year	Farm size class (ESU)	Dairy cows (LU)	Milk yield (t)	Paid production costs in €/ton	Income rate in €/ton	Total production costs in €/ton	Subsidies in €/ton	Total production costs less subsidies in €/ton	Imputed costs (€/ton)	
									Land	Capital
Rhineland-Palatinate	2002	(4) 16 - <40 ESU	20	5191	364.65		56.54		10.45	30.62
	2002	(5) 40 - <100 ESU	46	6341	293.52		34.71		12.76	24.71
	2002	(6) >= 100 ESU	84	6827	282.12		31.54		9.98	21.84
	2003	(5) 40 - <100 ESU	46	6698	299.39		33.65		12.40	23.47
	2003	(6) >= 100 ESU	89	6853	293.36		32.54		10.90	21.41
	2004	(5) 40 - <100 ESU	47	6575	290.62		49.12		12.51	23.23
	2004	(6) >= 100 ESU	90	6639	282.84		47.87		11.02	21.84
	2005	(4) 16 - <40 ESU	20	5800	352.08		64.18		13.06	25.71
	2005	(5) 40 - <100 ESU	47	6832	277.45		53.18		10.94	21.07
	2005	(6) >= 100 ESU	87	6818	267.34		50.91		9.61	20.89
	2006	(4) 16 - <40 ESU	18	6361	352.79		78.04		11.09	22.50
	2006	(5) 40 - <100 ESU	49	6938	290.99		63.69		10.51	21.94
	2006	(6) >= 100 ESU	94	7335	278.43		61.44		9.10	19.99
	2007	(4) 16 - <40 ESU	21	5825	391.36		83.80		12.25	23.13
	2007	(5) 40 - <100 ESU	48	6575	327.31		65.31		11.85	23.51
	2007	(6) >= 100 ESU	95	6945	322.23		60.82		8.15	21.34
	2008	(4) 16 - <40 ESU	19	5798	413.42		85.99		8.18	24.93
	2008	(5) 40 - <100 ESU	46	6973	302.29		60.47		9.29	21.54
	2008	(6) >= 100 ESU	93	7541	289.56		50.89		6.45	20.76
	2009	(4) 16 - <40 ESU	20	5603	376.30	468.66	844.97	89.64	755.32	10.16
2009	(5) 40 - <100 ESU	46	6955	278.46	191.75	470.21	62.90	407.31	8.62	21.12
2009	(6) >= 100 ESU	92	7717	276.79	110.51	387.31	52.50	334.81	6.17	19.87

Saarland

The milk production costs for Saarland for the period 2002 to 2009 could only be calculated for two farm size classes (5 and 6) (see table 5). These two farm size classes correspond to farms with an average of about 45 or 85 and more dairy cows.

In Saarland, the paid production costs for milk in farm size class 5 ranged from 30.1 cents per kg milk in 2006 to 35.9 cents in 2007 and in class 6 from 29.2 cents (2005) to 34.9 cents (2007).

In 2009, the paid milk production costs in the two farm size classes ranged from 29.8 to 34.0 cents per kg milk. The differences in the total costs for milk production after deducting the subsidies (between 46.7 cents in farm size class 5 and 35.4 cents in class 6) result from the differing labour costs for the work involved.

Table 5: Milk production costs in Saarland 2002 – 2009

Year	Farm size class (ESU)	Dairy cows (LU)	Milk yield (t)	Paid production costs in €/ton	Income rate in €/ton	Total production costs in €/ton	Subsidies in €/ton	Total production costs less subsidies in €/ton	Imputed costs (€/ton)		
									Land	Capital	
Saarland	2002	(5) 40 - <100 ESU	44	6426	332,42		62,91		12,90	24,71	
	2002	(6) >= 100 ESU	94	6966	292,04		45,88		11,70	21,43	
	2003	(5) 40 - <100 ESU	46	6509	332,69		59,69		12,55	23,91	
	2003	(6) >= 100 ESU	93	7053	305,64		44,39		11,77	22,12	
	2004	(5) 40 - <100 ESU	48	6649	316,22		69,13		11,38	24,53	
	2004	(6) >= 100 ESU	86	7225	293,33		56,19		10,61	21,82	
	2005	(5) 40 - <100 ESU	46	6398	306,01		75,63		9,84	24,68	
	2005	(6) >= 100 ESU	86	7287	291,63		61,63		9,47	21,63	
	2006	(5) 40 - <100 ESU	49	6787	301,20		79,31		9,50	21,60	
	2006	(6) >= 100 ESU	92	7415	297,55		67,13		8,20	20,93	
	2007	(5) 40 - <100 ESU	46	6318	359,43		96,31		10,04	24,81	
	2007	(6) >= 100 ESU	91	7152	349,19		70,96		8,73	23,44	
	2008	(5) 40 - <100 ESU	48	6600	358,58		86,87		7,73	23,75	
	2008	(6) >= 100 ESU	92	7668	330,12		69,53		6,10	21,96	
	2009	(5) 40 - <100 ESU	45	6600	340,42	222,81	563,22	96,06	467,16	7,68	23,47
	2009	(6) >= 100 ESU	95	7816	297,85	116,26	414,11	59,91	354,20	5,05	21,11

4.2 Interim results for North Germany

Schleswig-Holstein

The milk production costs for Schleswig-Holstein for the period 2002 to 2009 could only be calculated for the two farm size classes 5 and 6, with the exception of 2006 with three classes (see table 6). These two farm size classes 5 and 6 correspond to farms with an average of about 40 or 80 and more dairy cows.

In Schleswig-Holstein, the paid production costs for milk in farm size class 5 ranged from 25.1 cents per kg milk in 2005 to 30.2 cents in 2007 and in class 6 from 24.7 cents (2002, 2004, 2006) to 28.7 cents (2007).

In 2009, the paid milk production costs in the two farm size classes ranged from 24.9 to 26.8 cents per kg milk.

The differences in the total costs for milk production after deducting the subsidies (between 36.1 cents in farm size class 5 and 27.7 cents in class 6) result here again from the differing labour costs for the work involved (see column "Income rate in €/ton").

Lower Saxony

It was possible to calculate the milk production costs for Lower Saxony for the period 2002 to 2009 in all three farm size classes 4, 5 and 6 (see table 7). These three farm size classes correspond to farms with an average of about 20, 40 or 90 and more dairy cows.

In Lower Saxony, the paid production costs for milk in the smallest farm size class 4 ranged from 25.9 cents per kg milk (2002, 2006) to 32.6 cents in 2007, in class 5 from 25.4 cents (2005) to 29.1 cents (2007) and in class 6 from 24.4 cents (2005) to 28.5 cents (2007).

In 2009, the paid milk production costs in the three farm size classes ranged from 25.7 to 31.0 cents per kg milk. The differences in the total costs for milk production after deducting the subsidies (between 60.3 cents in farm size class 4 and 38.3 cents in class 5 and 29.3 cents in class 6) result here again from the differing labour costs for the work involved.

Table 6: Milk production costs Schleswig-Holstein 2002 – 2009

Year	Farm size class (ESU)	Dairy cows (LU)	Milk yield (t)	Paid production costs in €/ton	Income rate in €/ton	Total production costs in €/ton	Subsidies in €/ton	Total production costs less subsidies in €/ton	Imputed costs (€/ton)	
									Land	Capital
Schleswig-Holstein	2002 (5) 40 - <100 ESU	44	6668	255.19			31.80		31.59	16.75
	2002 (6) >= 100 ESU	81	7138	247.34			31.54		27.22	13.68
	2003 (5) 40 - <100 ESU	45	6698	264.46			30.94		32.97	16.78
	2003 (6) >= 100 ESU	81	7404	256.32			34.18		25.47	13.68
	2004 (5) 40 - <100 ESU	46	6926	262.32			40.01		27.86	15.92
	2004 (6) >= 100 ESU	81	7650	247.15			42.11		22.50	12.99
	2005 (5) 40 - <100 ESU	45	7021	250.71			49.26		32.58	15.13
	2005 (6) >= 100 ESU	82	7579	239.27			44.75		22.20	12.97
	2006 (4) 16 - <40 ESU	23	6344	264.74			56.04		79.49	18.87
	2006 (5) 40 - <100 ESU	47	7099	257.48			58.44		27.69	15.12
	2006 (6) >= 100 ESU	87	7958	247.58			54.02		21.83	13.27
	2007 (5) 40 - <100 ESU	47	7409	301.58			59.86		27.89	15.89
	2007 (6) >= 100 ESU	94	8043	287.41			51.75		17.20	14.13
	2008 (5) 40 - <100 ESU	48	7679	279.09			50.41		21.78	14.08
	2008 (6) >= 100 ESU	97	8117	267.77			46.15		12.55	12.70
	2009 (5) 40 - <100 ESU	48	7397	267.93	150.36	418.29	56.85	361.44	21.39	14.82
	2009 (6) >= 100 ESU	99	8161	248.85	75.42	324.27	47.47	276.81	12.85	12.52

Table 7: Milk production costs in Lower Saxony 2002 – 2009

Year	Farm size class (ESU)	Dairy cows (LU)	Milk yield (t)	Paid production costs in €/ton	Income rate in €/ton	Total production costs in €/ton	Subsidies in €/ton	Total production costs less subsidies in €/ton	Imputed costs (€/ton)	
									Land	Capital
Lower Saxony	2002	(4) 16 - <40 ESU	16	5825	259.28		32.90		15.23	17.86
	2002	(5) 40 - <100 ESU	41	6819	281.40		27.58		21.52	18.93
	2002	(6) >= 100 ESU	89	7115	276.80		30.10		15.53	17.11
	2003	(4) 16 - <40 ESU	18	6277	287.78		32.33		19.50	18.80
	2003	(5) 40 - <100 ESU	42	6947	276.74		27.84		18.41	18.36
	2003	(6) >= 100 ESU	92	7202	271.16		27.98		16.45	16.58
	2004	(4) 16 - <40 ESU	19	5864	266.37		42.94		14.44	20.66
	2004	(5) 40 - <100 ESU	46	7117	260.61		36.49		17.59	17.43
	2004	(6) >= 100 ESU	97	7392	255.28		37.77		15.28	15.86
	2005	(4) 16 - <40 ESU	19	5808	261.45		49.06		16.14	18.71
	2005	(5) 40 - <100 ESU	46	7239	253.74		46.07		17.56	17.12
	2005	(6) >= 100 ESU	99	7371	243.79		44.65		15.13	16.12
	2006	(4) 16 - <40 ESU	20	6545	259.46		59.41		18.70	18.07
	2006	(5) 40 - <100 ESU	47	7717	266.99		53.04		17.21	16.90
	2006	(6) >= 100 ESU	97	7643	257.46		49.90		15.10	15.55
	2007	(4) 16 - <40 ESU	20	6408	325.92		59.89		18.00	20.68
	2007	(5) 40 - <100 ESU	48	7618	291.08		52.75		16.03	17.37
	2007	(6) >= 100 ESU	97	7859	285.47		49.02		15.27	16.13
	2008	(4) 16 - <40 ESU	20	6327	318.44		58.29		18.36	17.71
	2008	(5) 40 - <100 ESU	46	7788	281.25		48.29		14.92	16.54
2008	(6) >= 100 ESU	99	7888	277.17		45.87		12.22	15.38	
2009	(4) 16 - <40 ESU	21	6491	310.32	358.19	668.51	65.23	603.28	19.08	17.37
2009	(5) 40 - <100 ESU	46	7794	272.00	162.39	434.39	50.92	383.47	13.05	16.60
2009	(6) >= 100 ESU	107	8218	256.74	81.53	338.27	45.43	292.84	11.29	15.26

North Rhine-Westphalia

It was possible to calculate the milk production costs for North Rhine-Westphalia for the period 2002 to 2009 in all three farm size classes 4, 5 and 6, with the exception of 2007 with just classes 5 and 6 (see table 8). The three farm size classes correspond to farms with an average of about 20, 40 or 85 and more dairy cows.

In North Rhine-Westphalia, the paid production costs for milk in the smallest farm size class 4 ranged from 26.8 cents per kg milk in 2006 to 32.4 cents in 2004, in class 5 from 26.8 cents (2005) to 34.3 cents (2007) and in class 6 from 25.9 cents (2005) to 30.3 cents (2008). In 2009, the paid milk production costs ranged from 27.3 to 30.9 cents per kg milk. The differences in the total costs for milk production after deducting the subsidies (between 61.4 cents in class 4 and 40.4 cents in class 5 and 30.1 cents in class 6) result here again from the differing labour costs for the work involved.

Table 8: Milk production costs in North Rhine-Westphalia 2002 – 2009

Year	Farm size class (ESU)	Dairy cows (LU)	Milk yield (t)	Paid production costs in €/ton	Income rate in €/ton	Total production costs in €/ton	Subsidies in €/ton	Total production costs less subsidies in €/ton	Imputed costs (€/ton)	
									Land	Capital
Northrhine-Westphalia	2002 (4) 16 - <40 ESU	22	6239	275.94			29.54		14.00	18.89
	2002 (5) 40 - <100 ESU	45	6821	291.95			26.75		18.87	20.36
	2002 (6) >= 100 ESU	85	7516	280.73			24.62		15.89	16.47
	2003 (4) 16 - <40 ESU	21	6268	287.02			30.57		14.84	19.57
	2003 (5) 40 - <100 ESU	44	7100	290.79			27.44		19.97	19.15
	2003 (6) >= 100 ESU	83	7636	286.94			26.51		14.23	16.71
	2004 (4) 16 - <40 ESU	21	6187	323.99			51.84		21.96	22.05
	2004 (5) 40 - <100 ESU	45	7279	274.73			36.37		17.84	18.21
	2004 (6) >= 100 ESU	88	7825	264.66			31.96		13.52	15.08
	2005 (4) 16 - <40 ESU	21	6507	300.84			63.34		23.00	21.56
	2005 (5) 40 - <100 ESU	46	7272	268.13			44.57		16.45	17.59
	2005 (6) >= 100 ESU	91	7935	258.73			38.34		10.99	15.12
	2006 (4) 16 - <40 ESU	23	6973	268.15			67.69		15.52	19.57
	2006 (5) 40 - <100 ESU	48	7507	293.42			55.76		16.59	17.66
	2006 (6) >= 100 ESU	98	8267	272.39			52.58		10.16	14.26
	2007 (5) 40 - <100 ESU	46	7201	343.43			62.85		15.11	19.22
	2007 (6) >= 100 ESU	101	8263	300.68			47.43		10.21	14.71
	2008 (4) 16 - <40 ESU	21	7043	308.26			69.19		19.64	18.91
2008 (5) 40 - <100 ESU	49	7582	327.59			56.43		13.93	17.86	
2008 (6) >= 100 ESU	98	8292	303.35			45.91		10.39	15.33	
2009 (4) 16 - <40 ESU	19	6908	308.79	381.09	689.88	75.02	614.87	14.74	21.42	
2009 (5) 40 - <100 ESU	47	7549	299.61	161.49	461.10	56.80	404.30	15.40	17.56	
2009 (6) >= 100 ESU	107	8457	272.78	73.35	346.13	45.39	300.74	8.90	15.86	

4.3 Interim results for East Germany

Brandenburg²⁹

The milk production costs for Brandenburg for the period 2002 to 2009 could only be calculated for farm size class 6 (see table 9). In the years under review, the farms in this class had on average between 160 and more than 250 dairy cows.

In Brandenburg, the paid production costs for milk in class 6 ranged from 32.5 cents (2005) to 44.5 cents (2008).

In 2009, the paid milk production costs amounted to 38.4 cents per kg milk. The total production costs for milk production after deducting the subsidies amounted to 34.0 cents.

Mecklenburg-Western Pomerania

The milk production costs for Mecklenburg-Western Pomerania for the period 2002 to 2009 could only be calculated for farm size class 6 (see table 10). In the years under review, the farms in this state had on average between 180 and more than 270 dairy cows.

In Mecklenburg-Western Pomerania, the paid production costs for milk in class 6 ranged from 31.2 cents (2004) to 38.2 cents (2007).

In 2009, the paid milk production costs amounted to 33.3 cents per kg milk. The total production costs for milk production after deducting the subsidies amounted to 31.1 cents.

²⁹ The FADN data do not distinguish between one-man businesses and legal entities. Many of the East German farms are organised as contract labour farms rather than family businesses. This is why a very low income rate is calculated for the East German states, with the wage costs accounting for an important share of the paid production costs.

Table 9: Milk production costs in Brandenburg 2002 – 2009

Year	Farm size class (ESU)	Dairy cows (LU)	Milk yield (t)	Paid production costs in €/ton	Income rate in €/ton	Total production costs in €/ton	Subsidies in €/ton	Total production costs less subsidies in €/ton	Imputed costs (€/ton)	
									Land	Capital
Brandenburg	2002	(6) >= 100 ESU	169	7446	335.74		45.98		3.67	17.07
	2003	(6) >= 100 ESU	201	7520	356.29		51.04		2.42	18.21
	2004	(6) >= 100 ESU	212	7617	325.95		48.98		2.62	17.11
	2005	(6) >= 100 ESU	212	7854	324.88		59.59		2.91	16.98
	2006	(6) >= 100 ESU	254	7926	363.05		69.12		2.36	17.62
	2007	(6) >= 100 ESU	247	8199	401.00		65.77		2.65	18.57
	2008	(6) >= 100 ESU	257	8139	445.49		69.56		3.82	19.94
	2009	(6) >= 100 ESU	210	8080	383.68	22.06	405.75	65.97	339.78	4.18

Table 10: Milk production costs in Mecklenburg-Western Pomerania 2002 – 2009

Year	Farm size class (ESU)	Dairy cows (LU)	Milk yield (t)	Paid production costs in €/ton	Income rate in €/ton	Total production costs in €/ton	Subsidies in €/ton	Total production costs less subsidies in €/ton	Imputed costs (€/ton)		
									Land	Capital	
Mecklenburg Western Pomerania	2002	(6) >= 100 ESU	195	7221	329.00		47.97		3.67	14.95	
	2003	(6) >= 100 ESU	204	7425	322.74		42.66		3.54	13.48	
	2004	(6) >= 100 ESU	238	7608	312.24		48.15		5.20	13.43	
	2005	(6) >= 100 ESU	244	7838	334.62		58.46		5.02	14.33	
	2006	(6) >= 100 ESU	267	8250	320.47		55.76		4.03	12.60	
	2007	(6) >= 100 ESU	271	8291	382.31		61.21		4.16	13.80	
	2008	(6) >= 100 ESU	256	8114	371.00		57.19		4.98	14.35	
	2009	(6) >= 100 ESU	184	8167	332.97	37.95	370.92	60.20	310.72	6.38	15.36

Saxony

For Saxony, the milk production costs for the period 2002 to 2009 were calculated for the farm size classes 5 and 6 (apart from the years 2006, 2007 and 2009; see table 11). These two farm size classes correspond to farms with an average of about 40 or 210 and more dairy cows.

In Saxony, the paid production costs for milk in class 5 ranged from 31.4 cents in 2005 to 39.8 cents in 2008 and in class 6 from 35.5 cents (2005) to 44.3 cents (2008).

In 2009, the paid milk production costs amounted to 37.5 cents per kg milk. The total production costs for milk production after deducting the subsidies amounted to 33.2 cents.

Table 11: Milk production costs in Saxony 2002 – 2009

Year	Farm size class (ESU)	Dairy cows (LU)	Milk yield (t)	Paid production costs in €/ton	Income rate in €/ton	Total production costs in €/ton	Subsidies in €/ton	Total production costs less subsidies in €/ton	Imputed costs (€/ton)		
									Land	Capital	
Saxony	2002	(5) 40 - <100 ESU	40	6264	341.60		60.21		3.62	30.92	
	2002	(6) >= 100 ESU	249	7301	406.37		58.93		1.32	21.49	
	2003	(5) 40 - <100 ESU	39	6145	333.36		53.71		4.26	30.30	
	2003	(6) >= 100 ESU	260	7828	384.91		49.88		1.43	17.95	
	2004	(5) 40 - <100 ESU	44	6375	325.80		64.49		3.90	29.19	
	2004	(6) >= 100 ESU	288	7873	372.43		55.36		1.59	16.02	
	2005	(5) 40 - <100 ESU	46	6544	314.13		83.64		3.78	28.13	
	2005	(6) >= 100 ESU	303	8105	355.28		48.03		1.74	14.80	
	2006	(6) >= 100 ESU	284	8003	383.85		77.75		1.95	17.49	
	2007	(6) >= 100 ESU	274	8159	409.67		64.84		2.21	18.23	
	2008	(5) 40 - <100 ESU	43	6489	397.92		112.74		5.16	30.70	
	2008	(6) >= 100 ESU	296	8109	443.39		69.21		2.73	18.80	
	2009	(6) >= 100 ESU	210	8140	375.43	27.76	403.19	71.50	331.70	2.99	19.15

Saxony-Anhalt

The milk production costs for Saxony-Anhalt for the period 2002 to 2009 could only be calculated for farm size class 6 (see table 12). In the years under review, the farms in this state had on average between 160 and more than 300 dairy cows.

In Saxony-Anhalt, the paid production costs for milk in class 6 ranged from 31.6 cents (2004) to 41.4 cents (2007).

In 2009, the paid milk production costs amounted to 32.1 cents per kg milk. The total production costs for milk production after deducting the subsidies amounted to 30.4 cents.

Table 12: Milk production costs in Saxony-Anhalt 2002 – 2009

Year	Farm size class (ESU)	Dairy cows (LU)	Milk yield (t)	Paid production costs in €/ton	Income rate in €/ton	Total production costs in €/ton	Subsidies in €/ton	Total production costs less subsidies in €/ton	Imputed costs (€/ton)		
									Land	Capital	
Saxony-Anhalt	2002	(6) >= 100 ESU	218	7259	370.16			50.37		1.59	18.65
	2003	(6) >= 100 ESU	211	7252	371.47			53.21		2.06	19.79
	2004	(6) >= 100 ESU	166	7417	316.22			52.72		1.40	16.64
	2005	(6) >= 100 ESU	199	7360	331.00			58.65		1.20	16.34
	2006	(6) >= 100 ESU	216	7994	316.83			65.12		0.97	17.10
	2007	(6) >= 100 ESU	265	7718	414.28			68.98		1.48	17.31
	2008	(6) >= 100 ESU	304	8159	379.26			62.77		1.92	15.25
	2009	(6) >= 100 ESU	195	7990	321.48	44.85	366.32	61.80	304.53	2.55	16.93

Thuringia

The milk production costs for Thuringia for the period 2002 to 2009 could only be calculated for farm size class 6 with the exception of years 2002 and 2005 (see table 13). In the years under review, the farms in this state in class 5 had on average 40 dairy cows, and between 280 and more than 390 dairy cows in class 6.

In Thuringia, the paid production costs for milk in class 6 ranged from 39.3 cents (2006) to 47.9 cents (2008).

In 2009, the paid milk production costs amounted to 42.8 cents per kg milk. The total production costs for milk production after deducting the subsidies amounted to 37.6 cents.

Table 13: Milk production costs in Thuringia 2002 – 2009

Year	Farm size class (ESU)	Dairy cows (LU)	Milk yield (t)	Paid production costs in €/ton	Income rate in €/ton	Total production costs in €/ton	Subsidies in €/ton	Total production costs less subsidies in €/ton	Imputed costs (€/ton)		
									Land	Capital	
Thuringia	2002	(5) 40 - <100 ESU	39	6648	372.52			53.71		6.69	34.28
	2002	(6) >= 100 ESU	388	7265	421.80			66.11		0.49	21.57
	2003	(6) >= 100 ESU	363	7591	404.25			57.97		0.67	19.94
	2004	(6) >= 100 ESU	367	7791	401.89			66.58		0.87	19.83
	2005	(5) 40 - <100 ESU	38	7181	331.54			75.54		6.40	26.67
	2005	(6) >= 100 ESU	396	7950	408.55			71.27		0.82	19.62
	2006	(6) >= 100 ESU	364	8006	393.02			81.35		0.92	20.11
	2007	(6) >= 100 ESU	357	7926	438.28			82.13		1.25	21.69
	2008	(6) >= 100 ESU	351	8177	478.69			76.06		1.38	23.71
	2009	(6) >= 100 ESU	281	8064	427.66	23.43	451.10	74.65	376.44	1.51	22.84

4.4 Interim results for distribution of the subsidies

Table 14 below shows the relevance of the individual subsidies for the farms in farm size classes 4, 5 and 6 in 2009. For all farms, the decoupled single farm payments (direct payments) account for the largest share of subsidies referred to the ton of produced milk (between 3.7 and 7.1 cents per kg milk).

It transpires that investment subsidies are only significant for farms in the larger farm size classes; it should be noted that the average values for investment subsidies stated here are on a low level (between about 0.5 cents per kg milk in Hesse and about 4 cents in Saxony). But the payments for the individual farms can be very high because certain investment amounts are prerequisite for receiving the subsidies. By contrast, in individual states the compensatory allowances are also relevant for smaller farms (Hesse, Rhineland-Palatinate, Baden-Württemberg and Bavaria).

Table 14: Distribution of the individual subsidies in 2009

Year	Farm size class (ESU)	Dairy cows (LU)	Milk yield (t)	Subsidies for ... / ton produced milk							
				Animal production	Crop production	Investment subsidy	Compensatory allowance	Intermediate consumption	External factors	Decoupled single farm payments	Subsidies in €/ton
Schleswig Holstein	2009 (5) 40 - <100 ESU	48	7397	0.21	0.01	0.00	0.00	3.38	0.76	52.49	56.85
	2009 (6) >= 100 ESU	99	8161	0.10	0.05	0.00	0.00	2.87	0.95	43.50	47.47
Lower Saxony	2009 (4) 16 - <40 ESU	21	6491	1.09	0.13	0.00	0.00	5.03	0.00	58.98	65.23
	2009 (5) 40 - <100 ESU	46	7794	0.89	0.17	0.00	0.00	2.87	0.74	46.24	50.92
Northrhine-Westphalia	2009 (6) >= 100 ESU	107	8218	0.62	0.08	0.00	0.01	3.00	2.20	39.51	45.43
	2009 (4) 16 - <40 ESU	19	6908	1.04	0.00	0.00	9.59	4.29	0.00	60.10	75.02
Hesse	2009 (5) 40 - <100 ESU	47	7549	1.55	0.26	0.00	2.72	3.56	0.18	48.54	56.80
	2009 (6) >= 100 ESU	107	8457	1.36	0.39	0.48	0.58	2.85	0.38	39.35	45.39
Rhineland-Palatinate	2009 (4) 16 - <40 ESU	19	5782	4.88	0.06	0.00	20.60	5.24	0.00	71.66	102.44
	2009 (5) 40 - <100 ESU	49	6649	4.13	0.70	0.54	13.27	4.98	0.99	56.21	80.81
Baden-Württemberg	2009 (6) >= 100 ESU	98	7460	2.24	0.88	6.70	6.22	4.35	0.63	51.32	72.33
	2009 (4) 16 - <40 ESU	20	5603	2.94	0.11	0.00	11.51	5.42	0.53	69.13	89.64
Bavaria	2009 (5) 40 - <100 ESU	46	6955	2.43	0.05	0.00	5.89	3.68	0.86	49.98	62.90
	2009 (6) >= 100 ESU	92	7717	2.25	0.10	0.00	3.87	4.23	1.04	41.00	52.50
Saarland	2009 (4) 16 - <40 ESU	22	5295	1.00	1.55	0.00	10.86	4.42	0.01	56.53	74.38
	2009 (5) 40 - <100 ESU	45	6223	1.05	0.99	0.00	5.23	3.97	0.09	50.24	61.57
Brandenburg	2009 (6) >= 100 ESU	103	6953	1.18	0.76	1.81	3.80	4.05	0.39	46.09	58.09
	2009 (4) 16 - <40 ESU	21	6087	4.14	0.32	0.53	11.06	3.61	0.22	49.29	69.16
Mecklenburg-Western	2009 (5) 40 - <100 ESU	43	6620	2.83	0.68	3.75	8.30	3.47	1.79	47.90	68.73
	2009 (6) >= 100 ESU	81	6844	2.05	0.54	0.55	6.03	3.53	3.07	47.36	63.13
Saxony	2009 (5) 40 - <100 ESU	45	6600	0.13	0.00	0.00	7.79	4.33	12.12	71.69	96.06
	2009 (6) >= 100 ESU	95	7816	0.20	0.02	0.00	0.53	3.90	1.96	53.29	59.91
Saxony-Anhalt	2009 (6) >= 100 ESU	210	8080	1.03	0.20	1.52	3.46	4.44	2.72	52.61	65.97
	2009 (6) >= 100 ESU	184	8167	0.06	0.54	0.00	1.25	4.24	1.35	52.76	60.20
Thuringia	2009 (6) >= 100 ESU	210	8140	1.09	0.20	3.98	4.72	4.36	0.77	56.37	71.50
	2009 (6) >= 100 ESU	195	7990	1.09	0.18	0.25	1.28	3.51	1.20	54.29	61.80
Thuringia	2009 (6) >= 100 ESU	281	8064	1.11	0.30	0.87	10.85	5.52	1.71	54.29	74.65

5 Final results: Updating the milk production costs for October 2012

This survey aims to produce statements about the current costs of milk production in Germany. The accountancy results of the FADN are always three years old. A method has therefore been developed for projecting the production costs for 2009 to the current circumstances prevailing in October 2012.

This entailed using the price indices calculated by the Federal Statistical Office for every year and also for every quarter. The projection method does not simply calculate the price changes: it uses the expenditure of the farms in recent years to estimate their reactions to changed costs as showed by their purchasing behaviour.

Since the agricultural reform of 2005, there have been extreme fluctuations in important cost types involved in milk production, such as concentrated feed, energy, fertilisers and pesticides (volatile markets), so that following a detailed review, it was decided not to use statistical forecasts as projection method, as these do not produce any reliable results.

5.1 Agricultural price indices by the Federal Statistical Office (Destatis)

The milk production costs were updated on the basis of the price indices referring to the purchasing prices for agricultural operating materials and the price indices referring to producer prices for agricultural products. These are generally acknowledged price indices which are used both by the European Commission and by the BMELV ministry for planning agricultural policy measures. They are also frequently used by agricultural

associations and serve for general market observation purposes (price development on the purchasing side of agricultural producers).³⁰

The index of purchasing prices measures price developments on the expenditure and income side of agriculture. At the moment, 2005 is taken as the basic year for detecting changes in the various price components (it is expected for the basic year to be updated to 2010 in 2013). The price indices are weighted averages from price change statistics. They are formed for a representative number of products or services and are based on quarterly price surveys by a representative number of 302 reporting agencies (agricultural cooperatives, agricultural traders, central market organisations). The quarterly prices are market prices (stated as prices without VAT in the survey).

Projected variables

Overview 6 shows those price indices for agricultural operating materials and producer prices published as of January 2013 by the Federal Statistical Office and used in this survey for projecting the costs.

Overview 6: Used indices (as of 2012, Destatis)

1. Index of purchasing prices for agricultural operating materials (2005 = 100)						
Record month	Agricultural operating materials					
	Seed and plants	Energy and lubricants altogether	Fertilisers altogether	Pesticides altogether	Mixed feed for cattle	Maintenance of machinery and material
Oct. 2012	151.3	142.1	202.8	111.3	202.7	129.3
2nd Producer price index for cattle						
Oct. 2012	139.8					

Table 14 shows that the projections were carried out on the basis of the price indices for seed, fertiliser, pesticides, energy and lubricants, mixed feed for cattle and the servicing and maintenance of machinery and material. Two price indices do not correspond directly to the FADN variables. This results in minor restrictions. The price indices for machinery and material take the place of the FADN variable SE340 "Machinery and building current costs", while the price indices for mixed feed for cattle take the place of the FADN cost item for purchased feed (variable SE310-SE315).

The cost values calculated in this survey for 2009 were used for all other cost items relevant for calculating the milk production costs on the basis of the FADN.

Analogue method

The authors of this study have developed an "analogue method" for projecting the cost variables on the basis of these price indices. The analogue method works according to the following basic presumptions:

1. 2005 is taken as the basic year for the agricultural price indices published by the Federal Statistical Office (price index 2005 = 100).
2. Farms react differently to these price changes depicted as price indices by adapting their expenditure (costs) on the corresponding agricultural production materials in varying ways.
3. The standard FADN results published by the EU Commission are used to understand the expenditure (costs) on operating materials. The costs or expenditure on the respective production materials in the FADN therefore reflect the alterations in the used quantity of agricultural production materials for the implemented price changes. This therefore explains how the farms have reacted to the price developments in the years following the basic year 2005.

³⁰ Federal Statistical Office (2012) Price indices for agricultural and forestry. Series 17, number 1, various years, Wiesbaden.

The analogue method works with the following individual calculation steps:

- Calculation of the percentage change in the price indices, starting with the price indices published by the Federal Statistical Office from the basic year 2005 (reference point = 100) through to October 2012.
- Stipulating an analogue year whose price development was as similar as possible to the currently published indices for October 2012. This presumes that a comparable cost development will also see a comparable alteration reaction by the farms in their expenditure on agricultural production materials.
- Comparison of the FADN standard results on the costs of the farms from 2005 to 2009 for the respective cost variables (purchased feed, seed, fertiliser, pesticides, upkeep of building and machinery, energy, beef production) with the price indices for agricultural production materials and producer prices according to the Federal Statistical Office from 2005 to 2012.
- Projection of the FADN cost variables to October 2012, by calculating the increase in costs in the FADN from 2005 to the analogue year.

5.2 Final results – the current production costs for milk in October 2012

The production costs for milk in October were estimated with the same calculation scheme that was already used to calculate the production costs on the basis of the FADN.

For statistical reasons (representativeness), the projection of milk production costs included only farm size classes 5 and 6 rather than all three farm size classes. Giving only partial consideration to farm size class 4 would have distorted the results.

The following two figures 1 and 2 show the results of the milk production costs projected to October 2012 for all federal states. The results refer to the production costs for farm size classes 5 and 6, depicting average costs weighted according to the milk quantity in these farm size classes:

- The paid costs of milk production in the federal states vary from 36 cents per kg milk (Schleswig-Holstein) to 53 cents (Brandenburg).

We recall: the "paid" costs depict the expenditure incurred by the farms in producing milk, without including the labour costs of the family farms (wage costs are included for the East German farms!).
- The income rate used to calculate the current milk production prices ranged from 11 cents to 19 cents per kg milk in the West German states (family farms!).

Fig. 1: Estimated paid costs plus income rate, weighted according to milk quantity in farm size classes 5 + 6, all federal states for October 2012

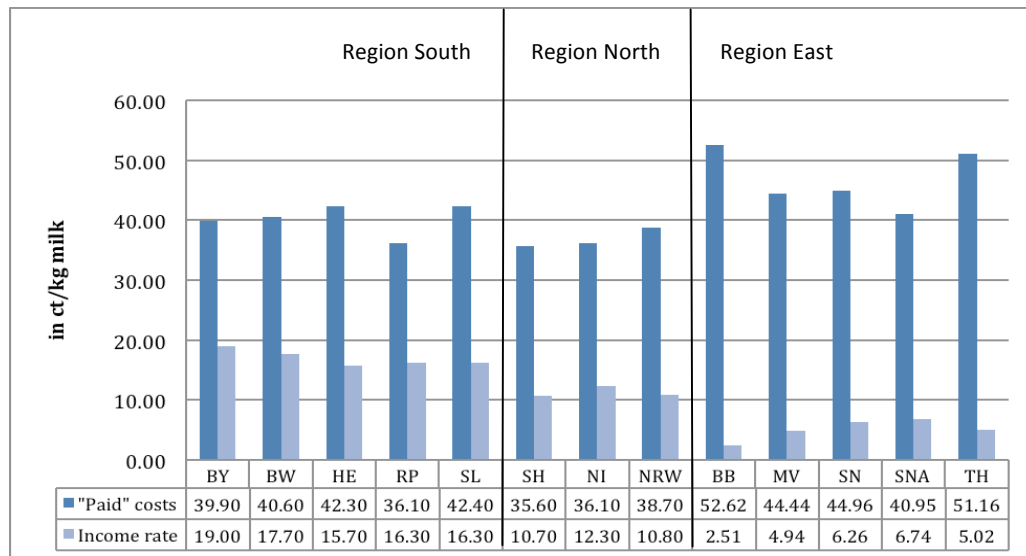
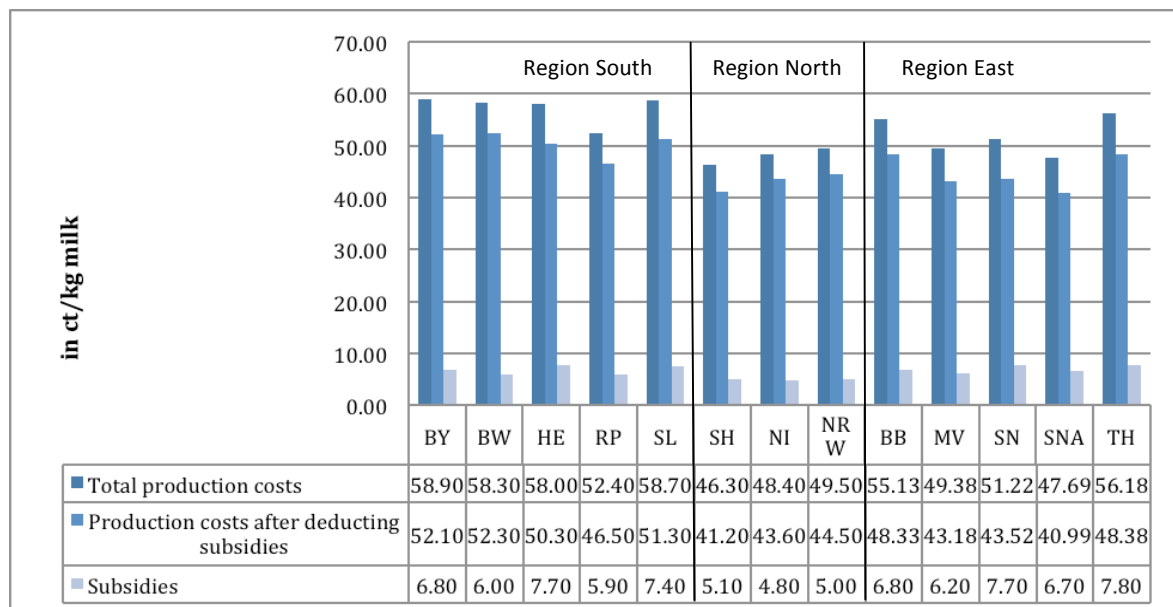


Fig. 2 shows the total production costs for milk production (rounded values). They are obtained from the paid costs and the income rate and range from 46 cents to 59 cents³¹ per kg milk in the federal states. After deducting the subsidies which are evaluated as income for the farms, this results in production costs ranging between 41 cents and 52 cents per kg milk.

Fig. 2: Estimated total production costs for milk with deduction of the subsidies, weighted according to milk quantity in farm size classes 5 + 6, all federal states for October 2012³²



³¹ Note: The figures published here have been rounded up or down and can therefore deviate slightly from previously published values.

³² BY=Bavaria; BW=Baden-Württemberg; HE=Hesse; RP=Rhineland-Palatinate; SL=Saarland; SH=Schleswig-Holstein; NI=Lower Saxony; NRW=North Rhine-Westphalia; BB=Brandenburg; MV=Mecklenburg-Western Pomerania; SN=Saxony; SNA=Saxony-Anhalt; TH= Thuringia

In a final step, the milk production costs of the federal states were grouped together for the three regions North Germany, South Germany and East Germany (again weighted according to milk quantity in the farm size classes).

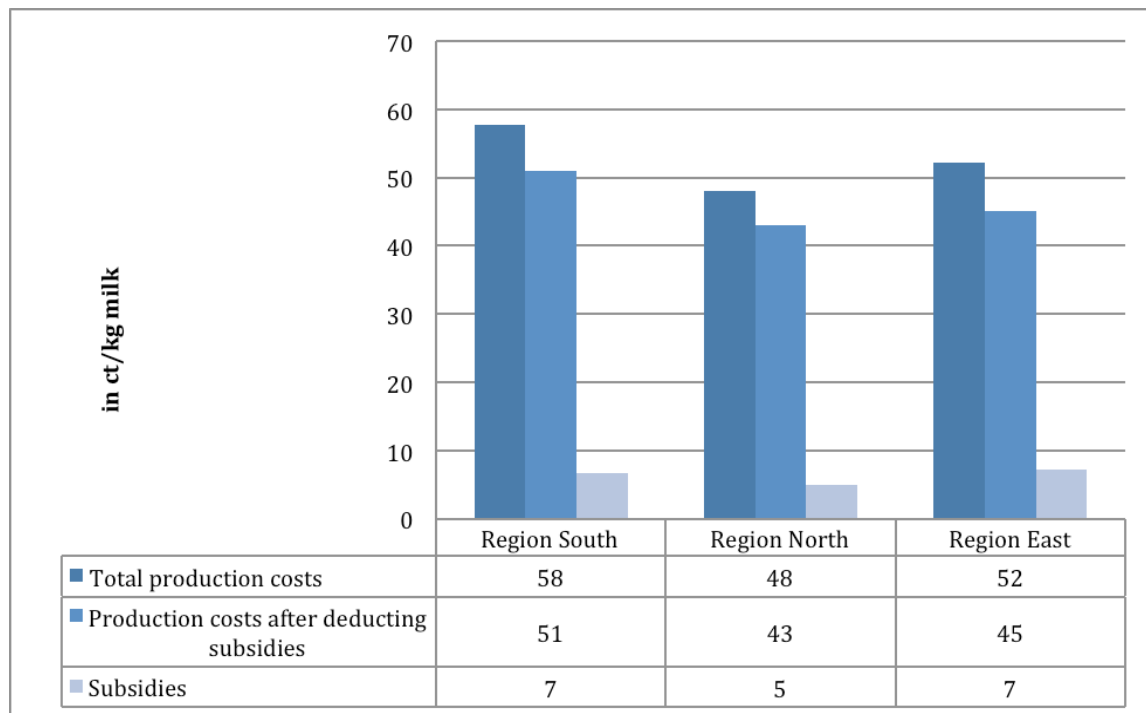
This produced the following results for the three regions North Germany, South Germany and East Germany:

- The milk production costs in North Germany (North Rhine-Westphalia, Lower Saxony, Schleswig-Holstein) amount to 43 cents per kg milk (after deducting the subsidies).
- The milk production costs in South Germany (Saarland, Bavaria, Baden-Württemberg, Rhineland-Palatinate, Hesse) amount to 51 cents per kg milk (after deducting the subsidies).
- The milk production costs in East Germany (Thuringia, Saxony, Saxony-Anhalt, Brandenburg, Mecklenburg-Western Pomerania) amount to 45 cents per kg milk (after deducting the subsidies).

These results do not include the imputed costs for capital (interest) and for land (rental charges). The imputed costs amounted to:

- 2.9 cents per kg milk in North Germany
- 2.4 cents per kg milk in South Germany and
- 3.2 cents per kg milk in East Germany

Fig. 3: Estimated total production costs for milk with deduction of the subsidies, weighted according to milk quantity in farm size classes 5 + 6, comparison of the regions, October 2012



6 Survey summary

In the course of this survey, a method was developed for calculating the costs of milk production in the same way for all EU member states. This report presents the results for Germany. The data were taken from the study of incomes in farms carried out by all member states for the EU (Farm Accounting Data Network, FADN). The German data were taken from the annual report of the German government regarding the economic circumstances of the farms (test farm network of the Federal Ministry for Food, Agriculture and Consumer Protection - BMELV). The great advantage of this information pool is that it is collated in the same way for all EU states, and is representative (see chapter 2). The full-cost calculations of milk production presented on an annual basis by the agricultural authorities in the federal states stand for the participating farms and are not representative. The FADN data make it possible to ascertain the costs according to federal states and according to farm size classes. The EU summarises the total costs of production in the farms according to individual cost blocks, and has developed a calculation scheme for the EU Dairy Farms Report which makes it possible to allocate the costs of the individual production branches to milk production (chapter 3).

This survey is based primarily on the EU evaluation scheme. However, the survey deviates from the EU evaluation scheme when it comes to allocating the costs for purchased and farm-produced feed, because the EU scheme allocates just as much feed to breeding as to the dairy cows. This approach in the EU evaluation is not wrong but comes from the alignment to all EU member states where it is a known fact that many operate a very extensive form of dairy farming. But in Germany where great use is made of concentrated feed in dairy farming, this would distort the results.

The cost calculations in the framework of this survey refer solely to the specialised dairy farms. These are farms where milk accounts for two thirds and more of sales revenues. The more versatile and diverse a farm's operations, the greater the source of error in allocating the costs. An initial step entailed ascertaining the actual production costs. These are all costs that have to be paid for by the farms (including depreciation costs). These are called "paid" costs.

After obtaining the "paid" costs for the individual federal states and farm size classes, in addition an individual income rate was developed for the self-employed farmers, referring primarily to the family workers (chapter 3.2). The income rate was ascertained on the basis of the standard wages for farm workers (with a standard executive wage for the farm manager and simple employees wage for the helping family members). By comparison: the EU uses a regional comparative wage, without any further details as to how this comes about. All direct state payments received by the farm are then deducted from the sum of the paid costs of dairy farming and the proportional income rate for the work of the self-employed farmer in dairy farming.

In line with a suggestion made by the Federal Cartel Office, the imputed costs are itemised separately and the milk production costs are shown according to federal state and farm size. Accordingly, the milk production costs are presented initially as an interim result, differentiated according to farm sizes and classes (chapter 4).

There is one major restriction with the EU data pool: when the values are published, they are already three years old. For this reason, the authors of this survey have developed a projection to the current circumstances (chapter 5). This uses the price indices calculated by the Federal Statistical Office for every year and also for every quarter. In doing so, the projection refers not only to the changes in prices but also uses looks at previous years to see how the farmers reacted to changing costs by changing their purchasing behaviour. But dairies do not register milk according to federal states and farm sizes. This is why the estimated production costs of milk for October 2012 have been weighted according to milk quantity in the farm size classes and summarised in the regions or price corridors for North Germany, South Germany and East Germany.

The current costs for October 2012 amount to 43 cents per kg milk in North Germany, 51 cents per kg milk in South Germany and 45 cents per kg milk in East Germany. The costs were calculated after deducting public subsidies, such as direct payments.

In October 2012, the average milk price in Germany amounted to 33 cents.³³ The comparison shows that the price paid for milk by no means covers the costs incurred by the farms.

³³ for 4% fat and 3.4% protein. Source: AMI

7 Literature

- BMELV (2011): Methodische Erläuterungen und Definitionen der Kennzahlen für die Buchführungsergebnisse der land- und forstwirtschaftlichen Testbetriebe. Bonn.
- BMVEL (various years) Buchführungsergebnisse Landwirtschaft. Die wirtschaftliche Lage der landwirtschaftlichen Betriebe. Bonn.
- Bundesamt für Landwirtschaft (Swiss Federal Office for Agriculture) (2011): Agricultural Report 2011. Swiss Confederation.
- Bundeskartellamt (German Federal Cartel Office) (2012): Sektoruntersuchung Milch. Final Report. Bonn.
- Coenberg, Adolf Gerhard (2007): Kostenrechnung und Kostenanalyse, 6th edition, Stuttgart.
- European Commission (2006): Costs of Production For Milk In The European Union. Brussels.
- European Commission (2007): Definition of the variables used in the FADN standard results of the Community Committee for the FADN in 2007, document RI/CC 882 rev. 8.1. Brussels.
- European Commission (2009): EU Dairy Farms Economics - 2008 Report. Brussels.
- European Commission (2010): EU Dairy Farms Report. Brussels.
- European Commission (2010): Farm Accounting Data Network. An A to Z of Methodology. Brussels.
- European Commission (2011): EU Dairy Farms Report. Brussels.
- Eurostat (2011): Agriculture and fishery statistics. Brussels.
- Hemme, Torsten (1999): Ein Konzept zur international vergleichenden Analyse von Politik- und Technikfolgen in der Landwirtschaft. Dissertation. Georg August University Göttingen.
- Hemme, Torsten (2010): Entwicklungsperspektiven von Milchviehbetrieben in Dauergrünlandregionen Schleswig-Holsteins. Project Report. IFCN Dairy Research Center. Kiel.
- Giffhorn, Elgin; Deeken, Eva (2000): Wettbewerbsfähigkeit der Milchproduktion in Deutschland, Work Report. Federal Agricultural Research Centre (FAL), Institut für Betriebswirtschaft, Agrarstruktur und Ländliche Räume, No. 01/2000. Braunschweig.
- Official Journal of the European Union (2008): Commission Regulation (EC) No. 868/2008 of 3 September 2008, L 237/18 Brussels.
- Rama, D., Keane, M. (1993): Production costs for milk in European countries. Franco Angeli Publishing. Rome
- Rebernick, Bernhard (2006): Grüner Bericht und INLB im Vergleich Analyse der Abweichungsursachen unterschiedlicher Ergebnisse in den Instrumenten zur Messung des landwirtschaftlichen Einkommens. Dissertation. University of Natural Resources and Life Sciences. Department for Economics and Social Science, Institute for Agriculture and Forestry, Vienna.
- Reichard, Christoph (2001): Script KLR I – WS 2001/02, Lecture on cost and performance accounting I, University Potsdam.
- Tietjen, Armin (2004): Produktionskosten der Milchviehhaltung. Dissertation. University Kiel.
- Wille, Steffi et. al. (2009): Vollkosten nicht ganz gedeckt. DLG communications No. 8/2009. Frankfurt am Main.

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