

Statistics on milk and milk products

Handbook
2018 Edition



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Introduction

Description. For decades, the milk market has been leading the Common Agricultural policy (CAP) to meet its initial objectives. Milk production has still a particular role in the EU agriculture and the statistics on milk and milk products, further to their historical role, provide a complete picture on milk and milk products and combine shorter and longer term statistics.

Objective. The handbook intends to present a complete view of the guidelines dedicated to statistics on milk and milk products. It should become part of a set of reference documents, on the definitions and concepts, on data validation and transmission or on other thematic issues.

Scope. In order to ensure complementarity with other documents without overlapping, the scope of this document is defined as follows:

- Statistics on milk and milk products required under Directive 96/16/EC and national information required for producing them, user needs and general description.
- Statistical activities specific to statistics on milk and milk products, design of the national statistical system to meet the EU requirements, and data compilation at national level.

Other reference documents. Data collection, validation, processing and dissemination by Eurostat are not specific to statistics on milk and milk products and are covered by the handbook on data validation.

- The specific concepts for milk are discussed and explained whereas their short definition is provided in the Handbook on definitions and concepts for Animal Production Statistics. The particular concepts used only in this handbook are also defined for clarity.
- The general legal requirements are compiled in the public annexes of the annual Working Group document on the review of compliance.
- Data transmission and related concepts (flags, deadlines, etc.), and data validation, are covered by the catalogue of tables for data transmission to Eurostat (webform templates) and the Handbook on data validation.
- Finally the Confidentiality Charter for Animal Production Statistics covers how the confidential data from the Member States are compiled in Eurostat in order to protect them from disclosure.

1.1 Changes from previous versions

Version 1 of the handbook was submitted to the Working Group on Animal Production Statistics met in Luxembourg on on 28 February 2017. It was first numbered as an Annex to Doc. ANI/WG/2017/1/06.

1.1.1 Changes in the structure

The present version follows a template for the handbooks in agricultural statistics. Therefore the headings and, where relevant, the paragraphs, have been re-ordered following the standard table of

content compared to Doc. ANI/WG/2017/1/06. It was reviewed by the working Group on animal Production Statistics during Summer 2018 and the comments were integrated here.

1.1.2 Changes in content

1.1.2.1 DISPLAYED CHANGES

The changes other than in the layout are displayed as follows:

- Text or figures inserted are displayed on blue background,
- ~~Text deleted is red and striken through,~~
- The simple changes in the layout are not displayed in a particular way.

1.1.2.2 INSERTED TEXT

The following items have been inserted:

- Figure 9 was updated
- Confidentiality
- Organic farming
- Completeness
- Additional numeric examples for filling in the tables.

1.2 Purpose of milk statistics

1.2.1 Policy needs

The scope of the Common Agricultural Policy (CAP) is defined by sectors of agricultural products, of which *milk and milk products* (Regulation (EU) No 1308/2013¹, Article 1(2)p). Milk is *the normal mammary secretion obtained from one or more milkings without either addition thereto or extraction therefrom* (Annex VII, Part III), if not used with other word or words (e.g. skimmed milk) and with the exception of milk which fat content has been standardised. It is wider than the definition of the *Codex Alimentarius*², which limits also it to milk *intended for consumption as liquid milk or for further processing*.

Health Directive 92/46/EEC³ and Decision 97/80/EC define raw milk as milk produced by secretion of the mammary glands of one or more cows, ewes, goats or buffaloes, which has not been heated beyond 40 °C or undergone any treatment that has an equivalent effect. This definition is even more restrictive regarding the four animal species. But it does not explicitly refer to milking, i.e. milk suckled directly by the calves is covered. This conflict related to the product itself, but the statistics of milk refer only to economic meaning of milk produced, including implicitly milking.

¹ Regulation (EU) No 1308/2013 of the European Parliament and of the Council of 17 December 2013 establishing a common organisation of the markets in agricultural products and repealing Council Regulations (EEC) No 922/72, (EEC) No 234/79, (EC) No 1037/2001 and (EC) No 1234/2007. *OJ L 347, 20.12.2013, p. 671–854*.

² *Codex Alimentarius*, Milk and Milk Products, WHO-FAO, 2011, <http://www.fao.org/docrep/015/i2085e/i2085e00.pdf>

³ Council Directive 92/46/EEC of 16 June 1992 laying down the health rules for the production and placing on the market of raw milk, heat-treated milk and milk-based products. *OJ L 268, 14.9.1992, p. 1–32*. Repealed by Directive 2004/41/EC. See Annex IV: Regulations (EC) No 852/2004 853/2004 and 854/2004.

Milk and milk products. Milk is produced on farms (agricultural holdings) by milking dairy animals. It can be sold as drinking milk to consumers, processed more or less (e.g. into butter or cheese), used on farms (e.g. for feeding animals), or delivered to a dairy enterprise, possibly by the farmers, eventually after grouping with milk of other agricultural holdings. The dairy sector processes raw milk and cream into dairy products, intended to be sold to the retailers or further processors, in the same or another country. The statistics on milk and milk products therefore describe (1) milk production and use on farms and (2) collection and processing by the dairy enterprises.

Main purpose. The statistics on milk and milk products describe production of raw milk by the agricultural holdings and how it is used, by them or by the dairy enterprises, especially on an annual basis. The scope of the shorter-term statistics is limited to the main part of the production, i.e. the only cows' milk *collected from farms* by the dairy enterprises. The longer term statistics describe detailed groups of dairy enterprises or of agricultural holdings (regional data). Historically, the aim was especially oriented on market monitoring. Nevertheless the need for more economic and longer term analysis has enlarged their scope (see Annex II). Especially, the statisticians and the policy makers have improved the statistical methodology in order to build a complete and coherent picture of the sector.

Market monitoring. Milk is first a product of the *dairy farms*, from cows, ewes, goats and buffaloes only for the EU milk statistics (Article 3 of the Directive). Cows' milk is the cheaper and the most important when referring to quantities. In a summary view, the raw cows' milk *produced on farms* is collected by the dairies and processed into dairy products, like drinking milk, butter, cheese and various other products. The skimmed milk powder and the butter are those generic products which the CAP has directly monitored for decades in order to regulate the market of all the dairy products. Such a regulation was intended to guarantee a sufficient income to the farmers while keeping reasonable the retail price of dairy products to the consumers. Although the market management rules have changed to limit distortion in international competition, those both products keep a leading role on the international market and their price and the volumes traded is core information for the milk market stakeholders. The main indicators are thus, further to production and marketed volumes of raw cows' milk, production of skimmed milk powder and butter on the one hand, and of other dairy products on the other hand, so that the second ones represent a regular and continuous flow, adapted to the needs of the consumers.

Market risk monitoring. With the 2013 CAP, market monitoring as previously implemented almost disappeared and only crisis situation are subject to forecasting and monitoring. The policy makers must be able to react fast to the market signals by appropriate measures and punctual crisis management requires nevertheless continuous flows of information.

Market transparency. The market operators are more involved in the market and transparency of this market (equitable access to information for everybody) is required so that they can play their role. The Milk Market Observatory (MMO)⁴ insures this transparency. Market information is especially about prices, production, stocks, and trade.

Economic analysis. The market management is supported by forecasts, based on economic analysis. The longer term trends require more detailed description of the dairy activity, regarding dairy products, international flows of dairy materials, and numbers and size of the dairy enterprises.

Organic farming statistics. Many particular segment of the market guarantee the farmers with higher payment of milk and milk products in counterpart of a commitment for quality and limited production methods. Organic production is the most relevant for the CAP policy makers. In order to provide comparable statistics on conventional and organic production, common definitions and methodology need to be favoured. Therefore particular issues on organic farming statistics are also covered in this handbook.

⁴ MMO website: http://ec.europa.eu/agriculture/market-observatory/milk/index_en.htm

Data flows. The EU statistics on milk and milk products are organised around data collection in the Member States, compilation and transmission of statistical tables to the Commission (Eurostat) for market monitoring. Shorter term market information is also notified by the Member States on the main drivers. Quality checks include plausibility and coherence with the existing statistics. Specific data flows cover organic farming statistics.

Main indicators. The statistics on milk and milk products are designed to produce

- Indicators on
 - Production of raw milk
 - Collection of raw milk (and cream),
 - Production of milk products from this raw milk
 - Other uses of the milk collected
- Monthly and annually
- At national and regional level

A triennial description of the structure of the dairy enterprises constitutes a complementary set of indicators.

High quality. The policy makers and the market stakeholder need strong guarantees on the quality of these statistics. Therefore a complex system of tables was designed putting strong constraints on the reported results for their internal coherence and coherence with other statistics (business, livestock, trade statistics) or technical indicators (e.g. fat and protein content of milk and milk products). The possible mistakes or biased results are thus made checkable in what looks like a whole accountancy system.

1.2.2 Legal basis

Directive. The EU legislation is based on a Directive. This means that the national legislation itself has to reflect the legal requirements set up at EU level. Beyond these EU requirements, countries are free to set up more ambitious national requirements, under subsidiarity (the way to obtain a national outcome required by the EU law, but not defined or controlled by EU).

History. The statistics on milk and milk products refer to Directive 96/16/EC⁵ (also called "the Directive" in this document) and Decision 97/80/EC⁶ (also called "the Decision" in this document). A brief historical analysis shows that Directive 72/280/EEC⁷ required much more detailed information regarding the market and the product components, including weekly statistics on butter and skimmed milk powder, but not covering the production sector, except regarding collection from and return by the dairies. With the development of IT tools and knowhow and of information requirements more oriented on policy relevance, weekly information is part of the administrative notifications from the Member States to the Commission (DG AGRI).

⁵ Council Directive 96/16/EC of 19 March 1996 on statistical surveys of milk and milk products. *OJ L 78, 28.3.1996, p. 27–29.*

⁶ Commission Decision 97/80/EC of 18 December 1996 laying down provisions for the implementation of Council Directive 96/16/EC on statistical surveys of milk and milk products. *OJ L 24, 25.1.1997, p. 26–49.*

⁷ Council Directive 72/280/EEC of 31 July 1972 on the statistical surveys to be made by Member States on milk and milk products. *OJ L 179, 7.8.1972, p. 2–4.*

The latest step of this change in leadership between statistical and non-statistical information is illustrated by Regulation (EU) No 1097/2014⁸ which set up notifications by the Member States of monthly cows' milk collection, already covered by the statistics on milk and milk products.

The organic production statistics, foreseen in Regulation (EC) No 834/2007⁹ (Article 36) and in Regulation (EC) No 889/2008¹⁰ (Article 93), must be handled by the statistical system to guarantee their quality. The *characteristics of statistical data and metadata shall be defined within the context of the Community Statistical Programme on the basis of models or questionnaires covering organic animal products.*

The so-called 'Table 1' inventories the organic market operators based on their main activity (NACE) while 'Table 3' covers the quantities produced for the four types of raw milk, for five main milk products, and for all the other milk products as a single item.

1.3 Implementation

1.3.1 Minimum and extended requirements

Minimum requirements. Directive 96/16/EC is transposed in the national legislations (see Annex IV). But the national needs can be wider regarding the content or more ambitious regarding the quality. Integration of the Directive in the national legislation should enable the particular national needs and objectives to be merged with the EU needs. Whether the national system is more expensive or more burdensome for the respondents than the minimum EU requirements is left to subsidiarity, i.e. it is governed by the national policies.

The national measures improving on the one hand quality of the statistics in the Member States downgrades, on the other hand at EU level, comparability and clarity. Diversity in the national statistical designs also limits possible further harmonisation. For each measure in the Directive, the national legislation can thus be analysed relatively to minimum and extended requirements.

For instance, a Member State can favour improvement in accuracy by extending the list of products or enlarging the size of the sample, while another Member State can choose to favour early availability of the results by setting up fast collection tools usable especially in the largest enterprises, and limited to the EU list of products. At EU level, these two national objectives are in contradiction and the results will be available when the latest Member State has delivered its data while accuracy of the statistics will not reflect the efforts of one Member State. In general, national diversity in implementation will meet the national needs first and the EU needs at the minimum.

But, as validated by the description of the national systems, the larger producing countries resource significantly their statistical process while the modest milk producing countries can limit their effort, which generates overall good results while preserving proportionality of the national efforts. Where relevant, this handbook highlights the various solutions resulting from the margin left to the Member States.

⁸ Commission Implementing Regulation (EU) No 1097/2014 of 17 October 2014 amending Regulation (EU) No 479/2010 concerning Member States' notifications in the milk and milk product sector. *OJ L300*, p. 39–40.

⁹ Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91. *OJ L189*, p. 1–23.

¹⁰ Commission Regulation (EC) No 889/2008 of 5 September 2008 laying down detailed rules for the implementation of Council Regulation (EC) No 834/2007 on organic production and labelling of organic products with regard to organic production, labelling and control. *OJ L 250*, 18.9.2008, p. 1–84.

Table 1. Main sources for diversity in implementing milk statistics

Statistical requirement	Directive 96/16/EC	Extended implementation
Representativeness of dairy enterprises	Dairy enterprises collecting cows' milk	All dairy enterprises All dairy products Including wholesalers
Dairy materials subject to double counting	Raw milk and cream, skimmed milk (liquid) from agricultural holdings	Every raw or processed intermediate dairy product
Protein content	Protein of cows' milk	All milks
Products in Table A	8 main products	Complete list of products
Revision	None	Multiple revisions

1.3.2 The set of statistical tables

Description. The Decision defines 13 statistical tables covering these various roles (see Annex VI).

The objectives of statistics on milk and milk products, as analysed based on their design, are:

- Providing raw milk production for the four main EU dairy species and the regional distribution of cows' milk production (annually);
- Providing the main uses of this milk on farms (annually);
- Providing milk collection by the dairy enterprises:
 - monthly for the cows' milk, and
 - annually for the four main EU dairy species;
- Providing the uses of this milk by the framework of dairy enterprises (the 'national dairy') as the quantities of the main dairy products obtained and as extensive uses (monthly);
- Guaranteeing coherence for the whole set of tables by stating how the statistics on availabilities and utilisation of milk draw a balanced picture. Describing the individual elements of the dairy sector (structure of the dairy enterprises) contributes to this objective and to the description.

1.3.3 Main material flows of milk and milk products

Principle. The dairy products listed and defined in Annex I of the Decision must be distinguished from the raw materials produced by the *dairy farms* (agricultural holdings) in order to avoid double counting in the flows between them and the dairy enterprises.

Raw milk. Milk produced by secretion of the mammary glands of one or more cows, ewes, goats or buffaloes, which has not been heated beyond 40 °C or undergone any treatment that has an equivalent effect.

When referring to material flows, raw milk is thus the milk from the agricultural holdings which has not been processed since milking. Raw milk includes milk skimmed by natural deposition of cream and it is not considered as processed.

Raw materials: especially raw (whole) milk, but also raw cream formed *naturally on the surface of the milk by slow agglomeration of emulsifying fat globules* and the resulting raw skimmed milk. As long as raw materials are not heated, transformed physically or chemically, processed otherwise, or packed in containers suitable for retail trade, they remain raw materials.

Raw milk production: collection of raw milk by milking the dairy animals, even if it does not fit for human consumption. Non-collected milk, e.g. from milking animal for vet care, is not included in production. Raw milk without economic value is not considered for the purpose of production.

Collection centre. Undertaking purchasing raw milk or cream from agricultural holdings but not processing it (see 2.1.1).

Dairy enterprise. Collection centre or undertaking purchasing raw milk or cream from the agricultural holdings or the collection centres with a view to transforming them into milk products (see 2.1.1).

Raw milk delivery: milk provided by the agricultural holding in bulk to any dairy enterprise, including delivery to foreign dairy enterprises.

Raw milk collection: milk collected in bulk from the agricultural holding by a dairy enterprise, including collection from foreign dairy agricultural holdings.

Logistic operation without ownership of milk is a **service**, either to the farmer or to the collector. Similarly processing into dairy products for the account of a third person is a service and the owner of the input and output is the acting dairy.

Collection concerns only the first transfer (with change of ownership) of raw materials *from farms* and any further transfer is not considered as collection. Regulation (EU) No 1097/2014 refers to the *first purchaser* in order to identify this transfer.

Without further indication on the statistical frame, for a given reference area, **delivery** refers to the agricultural holdings in a given area, even of milk delivered outside the area; **collection** refers to the dairy enterprises of a given area, even of milk collected outside the area.

Raw materials or products. Raw materials or products includes, further to raw materials, all the materials or intermediate products exchanged between the dairy enterprises in a country and considered as subject to double counting, in the sense of statistical activity referred to in Article 5(2) b of the Directive. They are described as "raw materials or products" in the second paragraph of Explanatory notes on Table B in Annex II of the Decision, but this concept is used wider than for the only calculation of Table B. For the purpose of this document, they are called **dairy materials**. For completing the picture, the other dairy products are called here **milk consumption products**.

Directive 92/46/EEC defines "milk for the manufacture of milk-based products" for milk, raw or treated only physically, containing only natural milk components.

The exchanges of dairy materials between the national dairy enterprises are accounted neither as use nor as availability (see 2.4.2.3). Similarly, when aggregating the national statistics into EU totals, intra-EU exchanges are accounted neither as use nor as availability.

Import of dairy materials: import of dairy material in bulk and included in collection, i.e. excluding raw material obtained from foreign agricultural holdings (accounted as collected by the first purchaser).

Export of dairy materials: export of dairy material in bulk by the dairy enterprises; the corresponding materials are thus not used for processing dairy products.

Delivery to national non-dairy purchaser: Delivery of dairy products by agricultural holdings to national non-dairy purchaser, even in bulk, is always summed up in the uses of milk. It is reported under "Direct sales" in Table C.

Changes in stock in the dairy enterprises: the increase (decrease if negative) of dairy material purchased but not yet processed. The stocks of raw materials or their changes in stock are not reported as such in the EU statistics on milk and milk products. Therefore they contribute to the "Differences" in Table B (code 6).

2

Methodology

2.1 Definitions and concepts

2.1.1 Dairy enterprises

Annex I shows that the scope of the various surveys on the dairy enterprises is subject to interpretation and the same could be reported regarding raw dairy materials. The definitions of both concepts are interrelated, processing of dairy materials contributing to defining the dairy enterprises while dairies can also be defined by their products. Whether the Member States consider only the minimum requirements or integrate also coherence in the design of the whole set of statistical tables shapes their interpretation.

In many places in the legislation, a **dairy** means a dairy enterprise. Therefore Decision 97/80/EC refers to the 'national dairy' as a single national dairy enterprise or processing system, or to production and utilisation of milk in dairies as in all the dairies enterprises. As **dairy** has various other meanings, its use as a single word is ambiguous.

Table 2 summarises the range left to national interpretations.

Table 2. Examples of minimum and extended interpretation of concepts

Definition	Minimum	Extended
Dairy material	Raw milk and cream, skimmed milk	Every dairy product in bulk
Collection centres	Not any processing activity	Separate logistic service for bulk raw materials of a dairy
Dairy enterprises	Purchasing raw material from agricultural holdings or collection centres	
	Identified by their input	Identified by their products (main or secondary NACE)
Dairy products	May be processed afterwards in the country (intermediate products)	Are intended to consumer without further packing or to export
Number of dairy enterprises	Minimum	The whole dairy sector
Cost	Limited	Extended
Outcome	Agricultural statistics	Agri-food statistics
List of dairy products	EU list	Developed list of products of national interest with various fat and protein contents

Location of dairy enterprises. The Directive does not provide indications on the link between the Member States and the set of dairy enterprises to be surveyed. The Decision provides precisions regarding Table E and relationship between the territory of a Member State and collection activity of a local unit. Doc. ASA/TE/M/495 (2002) referred to the issue of local units regarding confidentiality.

The most efficient compromise is that the dairy enterprises to be surveyed by a Member States are those which local units or plants are located on its territory. An enterprise having plants in various Member States should be surveyed for the activity of all the plants located in each Member State, like if distinct enterprises acted each one in a given Member State for all the plants in this Member State.

2.1.2 The national dairy

2.1.2.1 THE COUNTRY AS A DAIRY

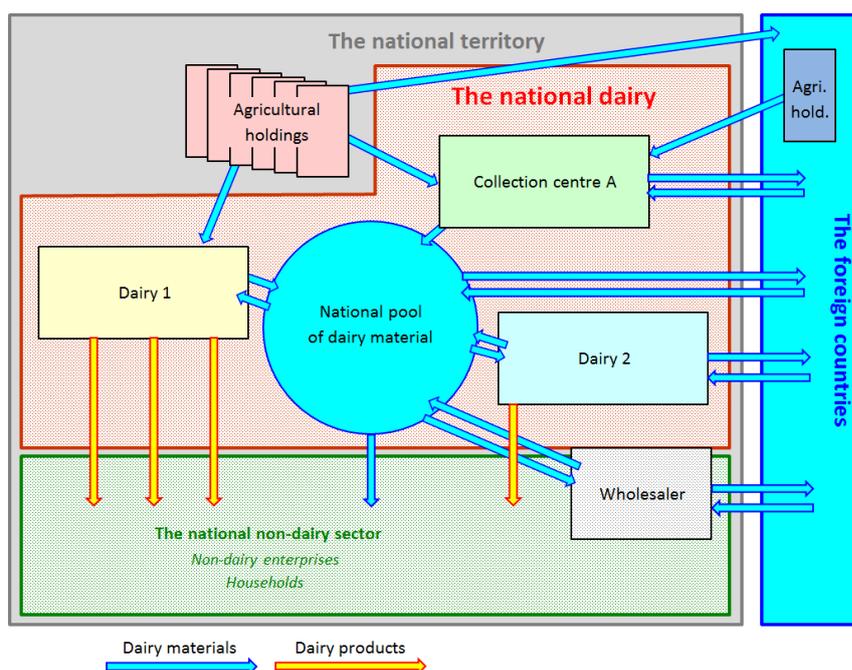
The statistics on activity of dairy enterprises refer to the particular concept of the 'national dairy', i.e. all the dairy enterprises of a country are treated as if they were the same huge enterprise. Therefore it is important defining what is in and out of this national dairy.

As explained under heading 2.1.1, the dairy enterprises are those enterprises which process raw milk materials. Those enterprises producing some dairy products from non-raw dairy products (e.g. milk powders, buttermilk, whey, butter oil) are not considered as dairy enterprises by Article 2 of the Directive.

Nevertheless the enterprises purchasing or providing dairy materials to those dairy enterprises are of interest to identify the possible import/export flows of dairy materials and depending on how the foreign flows are caught.

Figure 1 illustrates this issue.

Figure 1: The national dairy



2.1.2.2 INTERNAL FLOWS

Handling double counting. As a first statement, the product flows within the national dairy, i.e. between the dairy enterprises in the country should not be accounted. Only the flows entering or leaving the national dairy are to be considered.

Individual reporting. Once the dairy enterprises are listed, they must be identifiable by the other dairy enterprises, for instance by their VAT number or any other information available for the trade operations. Indeed the dairy enterprises themselves have to report separately for their transactions with those enterprises considered as dairy enterprises and for the other ones.

Here again two options are possible, i.e the single flow or the double flow recording.

- The single flow is the sum of all the incoming OR outgoing flows between dairy enterprises in the countries. This method requires less data, generates less issues for validation but quality is supposed lower than the other option
- The double flow records, for each individual dairy. The expectation is that the balance of these flows is null, which is rarely the case. Handling such information is more complex and more expensive but enables real data validation at individual level. Note that, further to double recording of input and output of dairy materials, considering input of other products (e.g. milk powders) is necessary for assessing individual situations. Actually the individual questionnaire is similar to the final national table, with furthermore exchanges of dairy materials with other dairy enterprises as availability and uses.

The large dairy enterprises use to provide consolidated results, i.e. after removing their internal exchanges of material between plants, for security reasons. Therefore they may have difficulties in providing their results early enough to meet the national needs.

Central register. Another possible design is that every transaction is registered in a common register which information is intended to be compiled afterwards. This is possible in the case of a dairy board under control protecting information on the individual dairy enterprises from other individual dairy enterprises (their competitors).

Input and output. The national dairies use dairy materials as input and generate dairy products as output. The EU statistics do not consider the stocks, but the changes in stocks can be considered in the national systems.

Input. Input of dairy materials in the national dairies is called availabilities, i.e. the dairy materials available for being processed:

- Raw milk collected from agricultural holdings wherever it is located
- Raw cream and skimmed milk and buttermilk collected from the agricultural holdings.
- Import of raw materials
- Import and collection of other dairy products is only considered when the corresponding output re-processed cannot be distinguished from the other output by the dairy enterprises. For instance skimmed milk powder used to regulate availabilities along the year should be accounted as an input. In the contrary, skimmed milk imported in bulk and only packed in the dairy should not be accounted.

Foreign milk collection or import of raw material? A difficulty is distinguishing between raw milk collected from foreign agricultural holdings and raw milk coming from foreign dairy enterprises or, even more uncertain, from foreign collection centres. In the EU interest, avoiding the mis-recording of such flows is critical, while for the national statistics, the results may look equivalent. Typically, a producer organisation grouping milk collection can be considered in one country as a collection centre and as an agricultural producer or a simple commissioner in the neighbour country. See Doc. ANI/WG/2016/1/09 for more details.

Imports. Regarding imports, the best information is to be drawn from the questionnaires to dairy enterprises. Indeed only the dairy enterprises can distinguish input of buttermilk and of whey or of skimmed milk. They can nevertheless hardly distinguish raw milk originating from foreign and from national agricultural holdings when an intermediate operator provides it. Especially when this operator is a simple importer, considering its activity is important to analyse the various flows of the national dairy. Such an operator which did not process milk and did not collect raw milk from national dairy agricultural holdings would have to be considered for its functional role.

Usually exchanges of dairy products packed in less than 2.5 kg or 2.5 litres is not considered as subject to be dairy material, especially in the case of cream and butter.

Output. With output, the situation is similar to input, with some transpositions. Identifying the agricultural holding is not an issue, but identifying the non-dairy operators or consumers purchasing milk in bulk requires collecting specific information. As well, delivery to intermediate operators possibly exporting dairy material in bulk may be challenging.

National consolidation. Consolidation is the calculation stage when internal flows are aggregated, so that only their balance is considered. The main difficulty comes from incoherence in collected information. A second issue is thus treatment of apparent incoherence. For instance a negative balance of internal flows indicates error in individual information (it should be balanced). Information available steers the method to be implemented, i.e. whether this error is to be identified and corrected or should be treated afterwards. This requires considering whether it reflects irrelevant flows between dairy enterprises or wrongly recorded input (imports or collection). Furthermore, even after having detected individual incoherence, residual error remains.

Depending on the options chosen for data collection, exported dairy material can be deducted from the surplus of the dairy output and import is added to the deficit in the dairy input.

2.1.2.3 ORGANIC PRODUCTION

Organic production. Information collected by the organic production control bodies is not designed to manage double-counting.

2.2 Measurements

2.2.1.1 USED MILK

Used milk. Used milk is the quantity of milk, whole (noted UWM) or skimmed (noted USM), used in the processes. Annex VIII provides several examples for use of this concept for the purpose of analysis and validation. The main purpose of this measurement is making comparable availabilities and utilisation for guaranteeing coherence of both sets of values. Some limits are also explained.

USM and UWM accountancy. The USM and UWM look complex to the newcomer. After having integrated this concept, it appears redundant with the fat and protein content of milk, but provides a more catchable unit for the experienced user. In most of the Member states, it is not intended to be collected from the dairy enterprises, but its calculation enables to better display interdependency between the processes for the various products.

Hierarchy in the list of products. For accurate analysis, displaying those categories of products by distinguishing the fat and slim products is even more appropriate than using directly the hierarchy of products of the EU nomenclature. Particularly drinking milks and milk powders display various fat content and their aggregates hide internal flows of skimmed milk. In a smallest range, cheese and whey or any products having a particular interest can also hide those flows. Therefore the list of products is also subject to minimum and extended requirements, the EU products being often aggregates of several national items of particular interest.

2.2.1.2 USED MATERIALS – FAT AND PROTEINS

Accountancy of dairy materials. While their input is normally known by the dairy enterprises, the quantities of fat and proteins are not systematically used by them. A more detailed list of raw products can be established to estimate the input contents (or USM and UWM) at the plant level. The questionnaire appears in this case like the second part of Table B with a further column recording the actual input in quantity.

The main difficulty consists in splitting the used milk amongst the dairy products obtained, which is realistic only when few dairy products are produced by a dairy. The internal flows of skimmed milk and buttermilk within the dairy are not known in such a case and further coefficients must be used to estimate their volume. Converting dairy material into virtual USM and UWM can also be based on coefficients, but input of intermediate products (e.g. milk powders) must not be neglected in this case. Therefore simple dairy processes are a condition for handling an actual accountancy of used milk at individual dairy level.

Measuring material input instead of fat and protein quantities fits thus with particular context:

- The products entering the dairy are not diverse
- The dairy products are not standardised
- Each dairy produces few different products
- The by-products (especially skimmed milk and butter milk) are not re-used in the dairy or the relevant quantities are known

More broadly when numerous small dairy enterprises purchase few products for simple non-standardised processes, measuring used milk can make the survey easier.

Measuring fat and protein content. On the contrary, where material management is under control in the dairy enterprises, in modern processes, fat and protein are the main drivers for industrial optimisation and their quantities are the everyday metrics handled in the dairy enterprises. In such a case, surveying them instead of used milk is easier.

Design of the national systems. The smaller and less modern dairy enterprises fit rather to the conditions for surveying used milk while the larger or more modern dairy enterprises fit rather to the conditions for surveying fat and proteins, the share of the later ones in the total production (or use of input) is essential for designing the volumes to be surveyed. Both kinds of surveys can be hardly combined and, in practice, fat and protein quantities are often surveyed on a sub-sample of dairy enterprises (the largest ones) where this information is available. Fat and protein content of the milk products can also be drawn from other sources, like ad hoc surveys, consumer surveys or research studies. The surveys based on milk-input measurement require an exhaustive knowledge of the flows of dairy material. In counterpart of the increase in burden, exchanges of dairy materials are more easily managed.

In conclusion, further to handling the dairy materials exchanged between dairy enterprises for avoiding double counting, the Member States design their dairy surveys by collecting information on the dairy products either based on their fat and protein content or on the dairy materials used. Where information between milk used cannot be directly connected to the various products, they use coefficients drawn either on a sub-sample or on other sources. As a result the EU requirements cover both systems.

2.2.1.3 OBSERVED PHENOMENA

The physical flows are considered differently for the national dairy (Tables A, B and H) and for the individual dairy enterprises being part of it (Tables D, E, F, G1 to G5).

Collection. The flows **from agricultural holdings to the national dairy**, wherever are located the agricultural holdings (even in another Member State) are called collection and may concern raw dairy products and other products.

- In Table A, only raw cow's milk and cream are considered,
 - The fat and protein content are expressed in weight percentage
- In Table B, raw milk and cream from all species, skimmed milk and buttermilk, and *other farm products* are considered. Depending on the case, the *other farm products* are considered as raw
 - The quantities are expressed in thousand tonnes
 - The fat content is expressed in tonnes
 - The protein content (of cows' milk only) is expressed in tonnes
- In Tables D and E, raw milk and cream (in milk equivalent) from all species, provide a partition of milk and cream collection in two parts, between the collection centres (E) and the other dairy enterprises collecting milk and cream (D)
 - The quantities are expressed in thousand tonnes
 - The classes of annual volumes collected are expressed in tonnes

Imports. The flows **of dairy material from abroad to the national dairy**, excluding collection from agricultural holdings in another Member State, and including only dairy material (to be processed). The foreign provider maybe a collection centre, another dairy enterprise, a wholesaler, etc.

- In Table B, milk (including raw milk, e.g. from foreign collection centres) skimmed milk, cream and other products (dairy materials)
 - The quantities are expressed in thousand tonnes
 - The fat content is expressed in tonnes

Milk treatment. The milk treated, i.e. the *whole milk (or whole milk equivalent) used for the manufacture of milk products*, includes milk from all species, collected, imported or received from another dairy enterprise. Skimmed milk treated is not included. The quantities transferred to another dairy enterprise are deducted.

- In Table F, concerning all the dairy enterprises processing whole milk or cream
 - The quantities are expressed in thousand tonnes
 - The classes of annual volumes treated are expressed in tonnes

Processing service. Where the dairy material is physically transferred for processing to a dairy enterprise and returned as different products after processing and without trade of the materials, the owner of the materials is considered as the dairy enterprise having processed the materials. The dairy enterprise providing this service should normally not report this activity, or at least not for itself.

Utilisations of milk and other availabilities.

- The Tables A, B and H describe how the milk is used.
 - The quantities are expressed in thousand tonnes,
 - The fat content (Table B) and the cows' milk protein content (Table H) are expressed in tonnes,
 - The input quantities (used milk) are expressed in thousand tonnes.

Dairy materials or consumption products. Depending on the national definition of dairy materials, the number of concerned products changes, but at least whole milk, cream and skimmed milk can be either an intermediate product (dairy material) or a *products obtained* (consumption product).

The dairy material is intended to be further processed by a dairy enterprise and the consumption products are intended to be provided, directly or not, to the consumers without further processing. Therefore a third category is identified, for the products intended to be further processed, but not by a dairy enterprise (e.g. food industry) or not to be provided to consumers (e.g. animal feed), and simply called *Other uses* (of milk) (5). The use of milk is ambiguous when it is *returned to farms* (3) and when it is exported (4).

The criteria for distinguishing the dairy materials and consumption products are

- Their packing for retail sale (up to 2 litres or 2 kg), making them definitely a consumption product
- For products in bulk (or over 2 litres or 2 kg)
 - Their purchaser, e.g. consumers or catering services purchase consumption products
 - non-dairy industry purchase milk for other use
 - dairy enterprise purchase dairy material
 - national wholesalers are considered purchasing consumption product if they don't export milk products in bulk; otherwise, or if the final destination of the products is unknown, it is considered as a consumption product
 - Exported products are considered as dairy materials, whatever is their final use, because they could have been used otherwise by the dairy delivering them.

Return to farms by dairies. *Return to farms* by dairies constitutes a particular flow in the reverse sense than collection as well as a particular use of milk by the dairy enterprises. It relates skimmed milk and buttermilk. Any other *return to farms* is considered as delivery of consumption products. Return of dairy materials or products must be distinguished from delivery by a processing service provider (above).

- In Table B, skimmed milk and buttermilk
 - The quantities are expressed in thousand tonnes,
 - The fat content is expressed in tonnes,
 - The quantity of used skimmed milk is expressed in thousand tonnes.

Exports and intra-Community dispatches of milk and cream in bulk. The whole milk, skimmed milk and liquid cream in bulk exported or dispatched in another Member State in bulk or container over 2 litres is reported as a use of milk by the national dairy.

- In Table B, whole milk, skimmed milk and cream
 - The quantities are expressed in thousand tonnes,
 - The fat content is expressed in tonnes,

- The input quantities (used milk) are expressed in thousand tonnes.

Other uses of milk by the dairies. The products intended to be further processed, but not by a dairy enterprise are accounted here.

- In Table B, for the relevant identified products
 - The quantities are expressed in thousand tonnes,
 - The fat content is expressed in tonnes,
 - The input quantities (used milk) are expressed in thousand tonnes.

Availability and uses of dairy materials. Out of collection from agricultural holdings and imports, and of the above exceptions on export, *return to farms* and other uses where the dairy materials are not otherwise used by the national dairy, the flows of dairy materials involve only dairy enterprises in the country. These internal flows of the national dairy are not considered as input or as output. They should not be summed up together with the availabilities entering the national dairies and the out-coming uses.

Use for producing consumption products. The main use of available milk (and other dairy materials) is its processing into consumption products. For the analysis of the *national dairy*, they can be delivered in bulk as soon as they are intended to the consumers.

- In Table A, for the relevant products
 - The quantities are expressed in thousand tonnes.
- In Tables B and H, utilisations for providing fresh (1) or manufactured products (2)
 - The quantities are expressed in thousand tonnes,
 - The fat content is expressed in tonnes (only items 12, 13, 14, 15, 16, 2, 21, 22, 221+222+223, 224, 225, 226, 23, 231, 232, 233, 24, 2411, 26, 27, 28, but not 25),
 - The protein content of cows' milk is expressed in tonnes (only items 12, 13, 21, 221, 222, 223, 224, 225, 23, 2411, 25, 26 and 27),
 - The quantities of input (used milk) are expressed in thousand tonnes (only items 12, 13, 14, 15, 16, 2, 21, 22, 221+221+223, 224, 225, 226, 23, 231, 232, 233, 24, 2411, 26, 28, but not 25 nor 27).

For the analysis of the individual dairy enterprises, they include also the dairy materials (e.g. milk powder) to be further processed by a dairy enterprise.

- In Tables G1 to G5, the relevant groups of products
 - The quantities are expressed in thousand tonnes
 - The classes of annual volumes treated are expressed in tonnes

2.3 Statistics by data sources

The statistics on milk and milk products describe three different kind of units:

- The statistics on agricultural holdings (tables C and I)
- The statistics on the so-called *national dairy* (tables A, B and H), and
- The statistics on the dairy enterprises (tables D to G).

2.3.1 Statistics on agricultural holdings

2.3.1.1 SURVEY ON AGRICULTURAL HOLDINGS

Article 1 of the Directive lays down that the Member States shall carry out annual surveys of the production of milk and its use among agricultural holdings within the meaning of Article 2(a) of Regulation (EC) No 1166/2008 of the European Parliament and of the Council¹¹.

Article 2(a) of Regulation (EC) No 1166/2008 indicates that 'agricultural holding' or 'holding' means a single unit, both technically and economically, which has a single management and which undertakes agricultural activities listed in Annex I within the economic territory of the European Union, either as its primary or secondary activity.

The agricultural holdings are called **farms** in the Decision. This introduces confusion but simplifies the wording (e.g. dairy farms), especially when it is used as an adjective (farm products, farm milk, farm cream, etc.). In this handbook, the reference to farms is kept only for wording drawn from the Decision.

Statistical frame. The statistical frame of the statistics on *production and utilisation of milk on farms* (Table C) is the framework of agricultural holdings with *production of milk*, i.e. with an economic activity of milking animals. The physical element indicating this activity is the presence of milked animals. Animals usually milked are also called **dairy animals**. As production of milk covers milk from cows, ewes, goats and buffaloes, agricultural holdings with dairy cows, ewes, goats and/or buffaloes constitute the basis for the milk agricultural holding statistics. The agricultural holdings where no economic activity of milking animals is reported (e.g. only fattening of cull dairy cows) are not considered.

Description. Table C intends to describe the possible sources and becoming of raw milk and materials on the agricultural holdings. In order to limit the number of statistical units to be surveyed, the statistics collected are not as detailed as those from Table B. Nevertheless this is a sound way to ensure coherence between collection reported by the dairy enterprises and potential for milk production by the dairy livestock.

Stratification. Some Member States distinguish those agricultural holdings processing milk (including selling raw milk to consumers) from those which deliver all their milk to dairy enterprises. A further distinction may contribute to increase data collection efficiency, on whether the agricultural holdings deliver milk abroad or not. If not, information can be obtained from the dairy enterprises in the country.

The location of the holding, the number and the species of the dairy animals or, if available, their annual milk production, constitute the most frequent additional criteria for stratification of the sample survey.

2.3.1.2 ADAPTATIONS

2.3.1.2.1 Contrasted relevance amongst EU areas

Milk use on farms. Table C is especially relevant when the share of milk production delivered to dairy enterprises is low, because it is the only source of information on what happens with the non-delivered milk. This share is impacted by several factors.

- **The species concerned:** ewes' and goats' milks are overall more *used on farms* (resp. 35 % and 37 % in 2014 in EU-28) than cows' milk (5%),
 - With local exceptions (e.g. almost 100 % of ewes' milk is delivered to dairy enterprises in France, 88% of buffaloes' milk in Italy vs. 5% in Romania),

¹¹ Regulation (EC) No 1166/2008 of the European Parliament and of the Council of 19 November 2008 on farm structure surveys and the survey on agricultural production methods and repealing Council Regulation (EEC) No 571/88. *OJL 321, 1.12.2008, p. 14.*

- Smaller quantities of milk produced by the smaller animals make it more likely to be *used on farms*.
- **The size of the dairy agricultural holdings**, as referring to the quantity of milk produced:
 - Smaller quantities of milk produced
 - Low level of investment
 - Low level of specialisation
 - Processing giving added-value to cheap family labour
 - Exception when collection by a producer organisation
 - Most likely in remote areas
- **The size of the dairy enterprises** in the area, as referring to the quantity of milk treated:
 - Direct effect of the total volume collected
 - Optimisation of milk collection
- Existence of traditional processing of dairy products on agricultural holdings
 - Added-value to the traditional processing knowhow
 - Consumption behaviour favouring processing on agricultural holdings
 - Protected Geographical Indication (PGI) making processing on agricultural holding mandatory for some products

Diversity amongst Member States. Some countries cumulate all factors favouring milk *use on farms* (Bulgaria, Croatia, Romania) while some other cumulate in the contrary factors favouring milk collection. In Romania, less than a quarter of milk production is delivered to the dairy enterprises and less than a half in Bulgaria. In general the most ancient Member States have seen their dairy farming and agri-food sectors shaped by the CAP and favouring industrial production. In the countries where delivery rates are higher, some variables in Table C may look irrelevant regarding some flows between the dairy enterprises and the agricultural holdings.

2.3.1.2.2 Adapted survey

National design. Based on national relevance of agricultural holding information on milk use, the efforts for collecting quality information for Table C are various. Some Member states survey a sample of agricultural holdings selling directly a part of their production. In this case volumes delivered to and returned from the dairy enterprises are reported by the dairy enterprises. Some other ones conduct a production survey on agricultural holdings, covering also crop and other animal production and covering all the agricultural holdings. Meanwhile, some Member States refer also to research study or even expert estimates to estimate own-consumption or use for feed.

Difficulty. An issue is that, where Table C is relevant, collecting relevant information from the agricultural holdings is difficult, as a significant number of these holdings do not record or measure the relevant variables. Furthermore the low level of efficiency of the processes makes standard parameters inapplicable.

Altogether, lower importance of milk used directly *on farms* favours indirect methods for estimating the variables of Table C.

2.4 Statistics on the national dairy

2.4.1 Cows' milk collection

Cows' milk collection is reported monthly in Table A and annually in Table B.

2.4.1.1 LEGAL REQUIREMENTS

Table A describes collection of cows' milk (and cream) and its main uses by the dairy enterprises.

- **The uses of milk** are not exhaustive and cover only processing into the main products (not all), without considering stocks, foreign trade, *return to farms*, or delivery to non-dairy industrial sector. In combination with an incomplete coverage of availabilities (imports are not included), no balance between availabilities and uses is expected. Nevertheless, the relationship between cows' milk collection and products obtained is expected to be relatively stable, while considering volatility of the changes in stock.
- The **legal precision requirements** refer only to the volume of cows' milk collected from the agricultural holdings. The minimum requirements do not enable to describe well production of the main dairy products. This is even suggested by the legal text, which foresees that intermediate products (raw milk or cream in bulk) takes part to the recorded products. The national dairy is thus not fully represented and, therefore, some internal flows of the national dairy must be considered as an output for the monthly statistics. Document ASA/TE/753 presented in 2015 illustrates by an example the products considered and the potential discrepancies with Table B.

Implementation. Knowing the option chosen by a country enables to interpret the national figures on the dairy products

- **Minimum requirement:** a limited sample of the dairy enterprises and collection centres collecting raw cows' milk; this favour a lower burden on the respondents and earlier results;
- **Extended requirements:** coverage of the whole dairy sector, improving possibly representativeness, coherence between the monthly and annual statistics, and dispatching the burden on the surveyed dairy enterprises with equity.

2.4.1.2 LIMITS IN USABILITY

Reference period. The calendar month reference period may raise some issues. Further to seasonality of milk production, cooled milk tanks and sanitary improvements on the agricultural holdings together with optimised milk collection made daily milk collection obsolete in most of the countries. Milk collection on Sunday became rarer and rarer and, combined with month durations from 28 to 31 days, comparability of the monthly results is damaged. Various ways for standardising the volumes are used in the Member States, with daily or weekly figures or with 30-day or one twelfth of a year standardisation. The advantages of one method compared to the other are limited and an EU standard can hardly be imposed at the time being.

Timeliness. The Commission had invited the Member States to deliver earlier their monthly results. When this led to improve the channels for collecting individual information, i.e. obtaining faster the same response rate, the quality of the results (apart from timeliness) remained at a similar level. But when the response rate has been impacted, the quality (especially reliability and accuracy) has been downgraded. For a given country, the estimates at 30 and 45 days are usually hardly comparable. The usual practice is revising the statistics of a given month when delivering those for the next month. For the data users, dealing with such heterogeneous estimates is not satisfactory. The early estimates intended to be revised should thus be properly flagged as provisional (flag 'P') when they are based on an insufficient sample (without being considered as unreliable or as estimates (flag 'E') if they are based on another method or data source.

Cross-border collection. Milk collection refers to reporting by the dairy enterprises, including from agricultural holdings abroad. In April 2015, the national quotas limiting milk collection from foreign agricultural holdings disappeared. The volumes of raw milk previously collected in the production country and exported by the dairy enterprises could be directly collected by the dairy enterprises abroad and cross-border milk collection developed. Stratification of the monthly samples supposes representativeness of the surveyed dairy enterprises and stable contribution to the national activity. With the development of cross-border milk collection and disappearing of constraints on the milk market, the volumes collected became more volatile, weakening the statistical assumptions. The result was an overall downgrading in quality of the statistics. While not explicitly requested by the EU legislation, the interest of the Member States for producing quality statistics should push those which have not yet done it surveying separately the volumes collected abroad.

2.4.2 Balance of availabilities and uses

Annual availabilities and uses of milk are reported in tables B and H.

Table B is a balance sheet of availabilities and uses of raw milk materials in the dairy enterprises, considering the assumptions and simplifications already mentioned. It has been extended in 2005 (Directive 2003/107/EC and Decision 2005/288/EC) with Table H (cows' milk protein content of the main dairy products). In order to establish a complete balance sheet, other milks should be covered, as well as other availabilities and uses (especially collection and external trade). The law writer assessed that the expected gains in quality were not sufficient compared to extra-burden for binding the Member States on them. Nevertheless the Member States are advised, for their own use and for guaranteeing a better quality, to extend the coverage of Table H to these additional items.

2.4.2.1 AVAILABILITIES

Content. The availabilities cover:

- especially cows' milk collection,
- other collection from agricultural holdings,
 - milks from other species (ewes, goats and buffaloes),
 - *other farm products*
- imports of dairy materials
 - total and intra EU
 - whole milk, cream, skimmed milk and other materials

Limit. The weakness of the requirements refers to fat and protein content of these further availabilities. The purpose is obtaining a complete and accurate total of availabilities regarding their fat and protein content, and therefore expressible in USM and UWM.

Data source on imports. The data may be derived from the questionnaires (more expensive and with a risk of mis-identification of the flows) or from the custom services (with a risk of under-coverage and of mis-identification of the products and therefore of their content). Depending on the total volume and on the number of enterprises concerned, one or the other option would be favoured. An intermediate solution is a joined questionnaire used for the milk product statistics and the custom services, reducing both risks in the interest of both data users.

Stocks. The initial stocks are not covered by the EU legislation. Regarding the stocks of fresh products, the changes in stocks from a year to another can indeed be considered as negligible. The other stocks in the national dairy may impact the outcome, especially when the trend changes. The EU law writer nevertheless considered that the balance between burden, inaccuracy, biases and cost, and resulting quality, was not in favour of recording this. The changes in stocks are thus part of the statistical differences watched afterwards (see 2.4.2.3).

2.4.2.2 UTILISATIONS OF MILK BY THE NATIONAL DAIRY

The part B of Table B refers to *utilisations* and covers especially

- Processing of milk products,
- Export of dairy materials,
 - Total and intra-EU
 - With the same issues as for availabilities and imports
- Materials *returned to farms*,
- Other uses of raw milk and materials, like bulk delivery to non-dairy agri-food sector
- Statistical differences

2.4.2.3 STATISTICAL DIFFERENCES AND LOSSES

Description. The statistical differences are a particular *utilisation*. In usual balance sheets the differences are positive values recorded either as deficit under resources (availabilities) or as surplus under uses (utilisations) so that the totals for resources and uses are equal. From an arithmetic point of view, fixing the differences as a positive or negative value always accounted under 'utilisation' is equivalent. Nevertheless the sign of this value remains important for analysis.

Meaning. The statistical differences cover especially

- the losses (a particular becoming of input materials)
- assumptions on negligible values (e.g. fat matter of skimmed milk)
- assumptions on non-covered items (e.g. changes in stocks)
- weaknesses in the methods (e.g. estimate of USM and UWM, imputation of non-response)
- cumulating the other statistical errors (measurement, non-measurement)

Scope. The statistical differences are calculated only on comparable measurements, i.e. fat and protein content, and USM and UWM. They are calculated as the discrepancy between the total availabilities and the total utilisations, before including these differences. It means that, once the statistical differences are included, the total availabilities and utilisations must be accurately equal.

Interpretation. *Difference and losses* is compared to the total of availabilities or utilisations. Its absolute value is expected to be small. As the total availabilities of USM use to be low, comparing *Difference and losses* in USM and UWM to the sum of their both availabilities makes interpretation easier. Furthermore expressing the USM and UWM relatively to the same divisor enables adding them simply.

For instance differences of -5% on UWM and of +5% on USM should be reflected by -10% in fat quantity and a balance of other components. In the contrary, differences of +5% on UWM and of +5% on USM should be reflected by a good balance of fat, but by also a surplus of 10% on the other materials. Coherence between the statistical differences in fat quantity and in (USM – UWM) reflects incoherence of that descriptor, i.e. a 'horizontal' issue on one of the product. Calculating afterward the fat content of UWMs should enable locating the source of possible dis-balance.

2.4.3 Coherence of Table B with other statistics

External coherence. Annex VI describes how statistics on milk and milk products relate with other statistics, coherence acting as a constraint. Tables B and H are part of the set of tables defined in Decision 97/80/EC and must be coherent with the statistics from other domains, like the livestock statistics or the foreign trade statistics.

Coherence with Table A is expected to be perfect regarding the definition of variable *Raw cows' milk collected*. The only differences expected when comparing it for a given country and year are due to statistical error, especially sampling effect. Changes in the role of the dairy enterprises collecting and processing raw milk can heavily impact coverage of Table A regarding the dairy products processed. Nevertheless the retroactive revision of Table A for coherence with Table B may downgrade usability of the monthly data (Doc. ASA/TE/753).

Coherence with Table C. Coherence of Table B with Table C relates to delivery of raw milk, raw cream, other dairy products by agricultural holdings to the dairy enterprises and to return by the dairy enterprises of dairy materials. Nevertheless the coverage of both tables can be slightly different at national level, as Table C is reported by the agricultural holdings and table B by the dairy enterprises. This comparison must consider the flows between the national agricultural holdings and the foreign dairy enterprises and those between the foreign agricultural holdings and the national dairy enterprises.

The main variable for this comparison is 'delivery of milk to dairies' in Table C, similar to the total raw milk collection (for all milks) reported by the dairy enterprises in Table B.

Coherence with Tables D to G. Coherence with the tables on the structure of dairy enterprises is to be considered as similarity in scale and the tolerance may be slightly higher. A discrepancy of few percentage points cannot be considered as reflecting incoherence. The eight tables are considered, either regarding milk collection (Table D and E), milk processed (Table F) or the quantities of the main products obtained (tables G1 to G5).

Coherence with the foreign trade statistics is especially important regarding the flows of dairy material. The difficulty is related to the distinction between dairy materials and dairy products, as the only indication provided by these statistics is the packing in container of more than 2.5 litres. These statistics tend then to over-estimate the quantities of dairy material exchanged, by including also those quantities of products packed in containers over 2.5 litres even containing drinking milk.

2.5 Statistics on individual dairy enterprises

Purpose. The statistics on individual dairy enterprises are, by nature, subject to confidentiality, as they are really detailed. Their purposes are especially

- Establishing and updating the list of dairy enterprises covered by the Directive,
- Assessing individual contributions to collection, processing and production in the dairy sector,
- Updating the statistical tools (sampling schemes, confidentiality of variables)

Data source. The list of enterprises is especially drawn from the business registers. In several Member States, the register provides the requested information on milk collection, processing and production of milk products. But, more often, this information is simply drawn from questionnaires already collected from the relevant enterprises, or requested from the not yet listed or surveyed dairy enterprises.

Three variables. The tables on the structure of dairy enterprises refer to three main measurements:

- Milk collection, i.e. transfer from the farms (including in other Member States) to the dairy enterprises, either processing it (Tables D) or not (Table E),
- Raw (whole) milk processed (Table F),
- Production of milk products from five main groups (Tables G1 to G5)

Coherence. The cumulated activities of registered enterprises constitute a ground reference for the annual statistics or, at least, for assessing plausibility of these statistics (see 2.4.3).

Confidentiality. The distribution of the enterprises may highlight a risk for confidentiality regarding one of the five identified groups of products. The Member States can design systematic confidential status for some products and the list of variables that they intend to publish.

2.6 Statistics on agricultural holdings

Milk production. The quantity of milk produced can be measured only at agricultural holding level, a part of production being used there and the statistics on the national dairy draw an incomplete picture of the milk sector.

Principle. The milk statistics on agricultural holdings are, like for the dairy enterprises, compiled as a balance sheet of availabilities and utilisation of milk. Nevertheless, major differences reflect the lower level of details that can be expected from this large and diverse statistical population.

Design. Table C was designed in five parts, i.e. on (A) availabilities of (i) whole milk and of (ii) skimmed milk and buttermilk, on (B) utilisations of (iii) whole milk and of (iv) skimmed milk and buttermilk, and on (v) the quantities of (C) products obtained. The items are broken down especially depending on whether the products were delivered to dairies or not. In the form for data transmission, these five parts are displayed sequentially.

Products. The main balance refers to whole milk. Skimmed milk is especially obtained from the butter and cream processes. In the various part of Table C, the products are grouped in different ways, butter and cream being grouped as products obtained. As well, cheese delivery to dairies is detailed in the farm statistics, but included in other products delivered to dairies in Table B.

Additionally, input of whole milk (UWM) for a given product is broken down between use for the product which was delivered and for this which was not.

The quantities milk products obtained are displayed so that they can be added to production by the dairy enterprises.

Skimmed milk. In the contrary of table B, the skimmed milk and buttermilk resulting from butter and cream processes or from cream delivery are not displayed as negative input but as additional availabilities. No balance of skimmed milk and buttermilk

Regional data. The value for production of cows' milk is also required at regional level (NUTS level 2).

Data sources. The Member States draw information from various sources, depending on available information and on the share of milk production non-delivered to the dairy sector.

- A farm production survey (together with the livestock survey) enables to collect this information. Whereas it is expansive and long, it is the default solution, applicable when no cheaper one can provide good results.
- Where available, the data on milking performance monitoring can provide valuable information. The undercoverage of the smallest farms can be corrected based on less frequent and well targeted data collection.
- Some countries use collection as recorded by the dairy enterprises, identifying the farm region together with the quantity of milk collected. But this method meets several limitations.
 - A limited sample of farms processing milk and/or selling directly their products is nevertheless necessary to complete the table.
 - In the case of regional statistics, this may lead to cases of confidentiality regarding the dairy enterprise information, whereas the statistical units in the frame are the agricultural holdings.

2.7 Measurement units

Products and used milk. The weights to be reported are generally in thousand tonnes for the quantities of milk or milk products, as well as for the quantities of used milk.

The fat and protein contents are expressed in percentage of weight in Table A and in tonnes in tables B and H.

Equivalent weight. For few products, the weight of products refers to equivalent weight of a particular product. This concerns butter and yellow products (expressed in butter weight equivalent), whey (expressed in liquid whey equivalent) and, in some cases, cream (expressed in milk equivalent).

2.8 Metadata (flags)

2.8.1 Non-significant and non-existing variables

Flag 'obs_status' N means 'non-significant'. This flag is always used with the value zero, but indicate that no accurate estimate can be calculated, due to the low value of this estimate.

This may for instance be the case for the return of skimmed milk to the farm in countries where this practice almost disappeared. The value is not accurately zero, as the phenomenon exists, but it cannot be properly estimated and, the value being really small, it can be rounded to zero when summed up with the statistics on other products or from other countries.

In the contrary, one can estimate accurately the value of milk powder production as zero where dairy enterprise is equipped to process the dairy powders. In this case, the accurate zero is provide as a zero without flag 'obs_status' N.

2.8.2 Confidential values

Regulation (EC) No 223/2009 and the confidentiality charter for animal production statistics describe why some values are confidential and how to treat them.

Individual information on the persons is confidential, i.e. it cannot be divulged in the published statistics. As protection of individual information is a serious and complex issue, a set of concepts and methods was developed on the so-called disclosure control.

Depending on the sector (systematic dominance of the largest enterprises) and on the Member State (tradition of protecting or publishing various types of information), the rules are different. Nevertheless, if a value is set as confidential, this impacts other values in the statistical tables.

For instance, if the value for ewe's milk cheese production (E) is confidential (there is only one dairy enterprise producing almost all the ewes' milk cheese in the area) and if the only other type of produced cheese in the area is from cows' milk (C), then the total production of cheese (T) cannot be published together with the production of cheese from cows' milk, in the same table or in different tables. Indeed, if both were published, anybody could easily calculate the ewes' milk cheese production as $E = T - C$.

In this case, the production of cheese from ewes' milk is primary confidential (it must be protected) while either T or C is secondary confidential, depending on a decision for publication.

In order to make repeatable the procedure (the same situation leads to the same decision), some rules are fixed in advance, in the Member states and in Eurostat. Indeed if a Member State published once the value for T and once the value for C, this would also threaten the confidential value.

The Member States are requested to transmit the confidential values, because the EU total may be publishable without threatening the national confidential values. The confidential values must be transmitted with flag 'obs_conf' = 'C'

Some simple rules must be applied, once the primary confidential cells have been identified. These necessary conditions are often not sufficient when considering the national rules.

- When considering an aggregate A of products $A_1, A_2, A_3, \dots, A_n$, there cannot be only one confidential value amongst $A, A_1, A_2, A_3, \dots, A_n$, i.e. there must be either none or at least two.
- When considering an aggregate A of products $A_1, A_2, A_3, \dots, A_n$, if any of the component A_i is confidential, A should not be set as secondary confidential, but rather some or all of the other components amongst $A_1, A_2, A_3, \dots, A_n$.

- Individual information is necessary to define the most efficient way to protect individual information, based on the national criteria.
- The list of aggregates defined for publication must be agreed in advance, and after considering all the aggregates published, at least at national and EU level, and possibly at regional level.
- For instance, publishing all the values for regional production of cows' milk cheese in the above example would disclose the national value for C. This would not be in line with the rule agreed at a higher level.

For instance, publishing all the values for regional production of cows' milk cheese in the above example would disclose the national value for C. This would not be in line with the rule agreed at a higher decision level.

3

Classification

3.1 Classification and definition of products

A classification of milk and milk products is displayed in Annex XI and the concepts and definitions are provided in a separate handbook.

3.1.1 Specific definitions and concepts

The standard classification of milk and milk products is based on the list of products provided in Annex I to the Decision. It has been extended in order to cover also:

- The raw milk and cream,
- The various aggregates resulting from the tabular format of Annex II to the Decision,
- The distinction, for the same products, between the various scopes under which the product can be observed.

3.1.1.1 MILK PRODUCTS

Annex I to the Decision provides the list of milk products, intended to be exhaustive, so that it excludes only raw materials and complex products with less than 50% milk. They are organised into a four-digit hierarchy and reflect the market of the milk products as at the time of drafting this list. The milk product under this nomenclature represent the outcome of dairy production. Referring to it for covering the raw materials (Raw cream as 13 for collection in table A or availabilities in Table B) is an attempt to compensate the lack of specific codes for the raw items as input of the dairies.

3.1.1.2 RAW MILK AND CREAM

Raw milk and cream are not processed and only the natural separation of cream from partly skimmed milk is accepted as generating non-processed materials.

3.1.1.3 TABULAR AGGREGATES

Many of the cells in the tables, when they do not refer to a milk product, refer to groups of products combined with a particular flow (import, export, collection, etc.). These aggregates, intended to limit burden to the only necessary milk products, need also to be organised together with the product classification.

3.1.1.4 SCOPE FOR THE PRODUCTS

From a semantic point of view, there should not be any objective difference between the raw milk delivered by the farms to the dairy enterprises and the raw milk collected by the dairie enterprises from the farms. Nevertheless, when considering the reporting units and their relationship with other Member States, the reported volumes are different.

4

Data processing

4.1 Calculation of aggregates

4.1.1 Calculation of aggregates in the Member States

The aggregates to be calculated are especially the following.

- Aggregates of products (sub-totals in a table), can already be implemented on the individual questionnaires, where final milk products are distinguished from transfers between dairy enterprises.
- Cumulation of monthly values (weekly values in some Member States) into annual totals must be implemented on the individual questionnaires and, even better, provided by the respondents.
- Aggregates of regions, where applicable could be better managed with a national calibration scheme, even if the regional results do not sum up into the same values. The outcome will be more reliable.

▪ Calculation of aggregates in Eurostat

Similarly, in Eurostat, several aggregates are calculated.

- Aggregates of products are only calculated for validation purposes.
- Cumulation of monthly values of Table A into annual totals are calculated. If any of the monthly value is confidential, the annual total is confidential.
- The various country aggregates, especially the EU total, are calculated in line with the confidentiality charter. The intra-EU trade is set at zero whatever is the sum of the national values. The extra-EU trade is calculated by discrepancy (Total import or export – intra-EU import or export).

4.2 Data preparation

4.2.1 Missing and unreliable data

The tables sent to Eurostat must be complete, except in exceptional cases.

Where a cell is empty once prepared for transmission, the data preparer, must analyse the reason, and try to fill in depending on the case (see also 2.8.1).

- A cell is empty because the phenomenon does not appear in the country. The quantity produced, the milk used to produce it, the fat and protein content are all zero. This could be implemented earlier in the process and, in the individual questionnaire, it would be filled with zero if the question existed.
- A cell is empty because the phenomenon can be reported, but the related measurements are negligible (e.g. there are few buffaloes which certainly produce milk, but so few). In this case, the value of quantity produced is close from zero, but nevertheless positive. In the individual questionnaire, few statistical units, but some, would provide a positive answer.
- A cell is empty due to a statistical problem (non-response, sampling, unavailability of the usual data source). Providing a satisfying estimate (to be flagged as such, `obs_status = 'E'`) is a possibility but, depending on the variable, this may appear impossible. In this case, the mandatory cell have to be replaced with 'NA', as non-available.

Providing all the statistical values required by the legislation is mandatory. The only cases when non-compliance to legislation can be accepted are those due to unexpected events.

4.2.2 Filling in the tables

Annex VIII – Filling in Table B and H, Annex IX – Filling in Tables C and I and Annex X – Filling in Tables D, E, F and G explain how to fill in the statistical tables.

5

Quality reports

5.1 National methodology

5.1.1 National methodological questionnaire

In order to support data interpretation, a national methodological questionnaire is delivered every year. Its original design was adapted in 2018 to the ESS metadata handler structure.

It describes the national stakeholders compiling the statistics on milk and milk products, the collection methods and issues, and the particular design in implementing the Directive and the Decision.

5.1.2 National survey questionnaires

The national services are also requested to provide the survey questionnaires. In the case of on-line data collection, the list of questions and variables are the equivalent of this questionnaire in a similar way.

5.1.3 Other methodological information

When drafting the present handbook, the Member States were requested to check and, where relevant, to provide missing information on their situation.

5.2 Quality reports

No quality report has yet been developed beyond the national methodological reports defined in the Decision.

Annex I – Inventory of working group documents

Inventory of working group documents on the methodology of statistics on milk and milk products (Documents available in electronic format)

Group ¹²	Meeting date	Item and Title	Doc. type	Doc. Number	Pages ¹³	Short description	Author ¹⁴	
National methodology - milk questionnaires								
WG MILK	25/26-NOV-2002	1	Methodological questionnaire concerning milk statistics	DOC	ASA/TE/M/493	17	Compilation of the methodological questionnaires, conclusions, TAPAS 2004 actions.	AB
WG MILK	26/27-JUN-2003	2	Methodology of milk surveys and questionnaire	DOC	ASA/TE/M/515 rev.1	3 (9)	Draft methodological questionnaire form.	FZ/AB
WS MILK	27-JUN-2003	2	Methodological questionnaire on milk statistics.	DOC	ASA/TE/M/CC/20	85	General description of the methodology in the CCs	FW
WG MILK	01/02-JUN-2004	5	Methodological questionnaire	DOC	ASA/TE/M/570	14	Eurostat presents the methodological feedback from 15 MSs + 3CCc.	AA
WG MILK	04/05-JUL-2005	1	Analysis of questionnaire and open points on concepts and definitions	DOC	ASA/TE/576	2	Compilation of the methodological questionnaires + questions to some MSs.	AB
WG ANI	17/18-MAR-2011	3.4.2	Implementation of Decision 97/80/EC - Milk questionnaires	DOC	ASA/TE/690	5	Compilation of the methodological questionnaires	PM
WG ANI	13/14-MAR-2012	10.2.	Milk questionnaire	DOC	ASA/TE/710	1 (5)	Summary methodology for 2010.	PM

¹² WG Working group/Working Party or WS Workshop; MILK Working Group on milk and milk products statistics; ANI Working Party/Group on animal production statistics

¹³ Pages: Number of pages, excluding the cover page (possibly with the number of annex pages between brackets).

¹⁴ AA Agostino ANGELINI, AB Alain BISVAL, BM Brigitte MISONNE, FW Francis WEILER, FZ Franco ZAMPOGNA, GM Garry MAHON, PM Pol MARQUER, RAD Rodrigo ATAIDE DIAS, SH Sophie HELAINE, TR Teresa RABADE, YZ Yves ZANATTA

Group ¹²		Meeting date		Item and Title	Doc. type	Doc. Number	Pages ¹³	Short description	Author ¹⁴
Confidentiality and EU totals									
WG	MILK	20/21-DEC-2000	5	Confidentiality and milk statistics	DOC	ASA/TE/426	3 (5)	Proposal for agreement on hiding particular products for each MS to avoid disclosure: not agreed as secure.	FZ
WG	MILK	14/15-NOV-2001	4	Confidentiality: situation regarding the application of the decisions taken during the previous meeting	DOC	ASA/TE/M/461	4	Eurostat control on national confidential results is inapplicable; request for investigations on publically available individual results.	FZ
WG	MILK	25/26-NOV-2002	3	Confidentiality in milk statistics	DOC	ASA/TE/M/495	5	Referring local plants instead of enterprises is inapplicable. Using EU14 for EU15	FZ
WG	ANI	12/13-MAR-2008	3.5	Confidential data	DOC	ASA/TE/F/636	8	Inventory of confidential values + options for improvement.	RAD
WG	ANI	28/29-APR-2009	3.3	Confidential data	DOC	ASA/TE/F/651	2	State of work and proposal for confidentiality charter (ASA/TE/F/652).	RAD
WG	ANI	28/29-APR-2009	3.3	Confidential data	DOC	ASA/TE/F/652	10	Proposal for a confidentiality charter.	RAD
WG	ANI	16/17-MAR-2010	4.2	Confidential data	DOC	ASA/TE/675	5 (19)	Publication of safe EU totals after TF on confidentiality	GM
WG	ANI	13/14-MAR-2012	8.	Use of flags for confidentiality (Statistical Law)	DOC	ASA/TE/708	2	Sound use of confidentiality flag	PM
WG	ANI	13/14-MAR-2014	4.3.	Revision of the confidentiality charter in animal production statistics	DOC	ASA/TE/734	9 (17)	Rules for treatment of confidential values and revised confidentiality charter.	PM
WG	ANI	11/13-MAR-2015	4.3.	Confidentiality charter	DOC	ASA/TE/752	8 (30)	Revised charter after comments and extended to further confidentiality cases	PM
WG	ANI	17/18-MAR-2011	4.4	Dissemination of EU total estimates	DOC	ASA/TE/695	4	Standard estimation methods for missing non-confidential values	PM

Group ¹²		Meeting date		Item and Title	Doc. type	Doc. Number	Pages ¹³	Short description	Author ¹⁴
Milk content									
WG	MILK	20/21-DEC-2000	3	Balance « Whole Milk »	DOC	ASA/TE/424	3	Milk from foreign farms accounted as import. New code for processed cheese	FZ
WG	MILK	20/21-DEC-2000	4	Protein content in milk and milk products	DOC	ASA/TE/425	2	Voluntary collection of statistics on milk proteins for 1999, 2000 and 2001.	FZ
WG	MILK	14/15-NOV-2001	3	Protein content in the main milk products : account of the measurement methods...	DOC	ASA/TE/M/460	14	Review of the national methods for estimating protein content	FZ
WG	ANI	13/14-MAR-2014	6.2.	Balanced accountancy of milk content	DOC	ASA/TE/741	3 (7)	Explanations based on Doc. ASA/TE/M/564 Rev 1 (2004)	TR
Raw materials									
WG	MILK	01/02-JUN-2004	3.3.	Double counting in dairy statistics	563	ASA/TE/M/563	2	Questions on double counting and intermediate products	AA
WG	MILK	01/02-JUN-2004	3.4.	Input and Output in milk processing	564	ASA/TE/M/564	7	Need for whole milk and skimmed milk for availabilities	AA
WG	MILK	01/02-JUN-2004	4.2.	Processed raw materials by cheese making	566	ASA/TE/M/566	2	Outliers in milk use for cheese processing	AA
WG	MILK	16/17-FEB-2016	9	Cross-border milk collection	DOC	ANI/WG/2016/1/09	4	Risk for double- or no- counting due to cross-border milk collection	PM

Group ¹²	Meeting date	Item and Title	Doc. type	Doc. Number	Pages ¹³	Short description	Author ¹⁴	
List of products and definitions								
WG MILK	26/27-JUN-2003	6	Revision of PRODCOM	DOC	ASA/TE/M/520	1 (4)	Changes in the Prodcom list of milk products.	FZ/AB
WG MILK	01/02-JUN-2004	3.1.	Nomenclatures used in dairy statistics	DOC	ASA/TE/M/561	2	Incoherence with CN in the definitions	AA
WG ANI	03/04-JUL-2006	5	Definitions of milk products in Commission Decision of 18/12/1996 and in PRODCOM	DOC	ASA/TE/624	6 (6)	Required adaptations to better fit with Prodcom	GM
WG ANI	28/29-APR-2009	4.3	Milk statistics	DOC	ASA/TE/F/660	6 (12)	After failure in harmonising the list of products, the questionnaire of FR proposed as a template	RAD
WG ANI	11/13-MAR-2015	5.1.	Methodology of milk statistics	DOC	ASA/TE/753	9 (17)	Issues on Table A (revisions and various needs) + some product definitions	PM
WG MILK	16/17-FEB-2016	10	Drinking milk	DOC	ANI/WG/2016/1/10	3 (1)	Drinking milk definition need to be aligned with market definitions	PM
WG MILK		6	Handbook on statistics of milk and milk products	DOC	ANI/WG/2017/1/06	4 (78)	First version of a handbook	PM
Seasonal changes								
WG MILK	01/02-JUN-2004	6	Quantitative analysis of seasonal cycles in cow milk collection	DOC	ASA/TE/M/557	7 (3)	Model of seasonal changes in milk collection (FFT-3)	AA
Data needs								
WG ANI	14/15-MAR-2013	6.3.	Milk data needs	DOC	ASA/TE/724	4	National purpose of milk statistics but premature investigations.	PM
WG ANI	11/13-MAR-2015	3.2.	Explanation on the data needs	PPT	ANI_3-2_Statistical needs.pptx		Experience of the milk market observatory.	SH
WG ANI	11/13-MAR-2015	5.1.	Methodology of milk statistics	DOC	ASA/TE/753 Annex 2	9 (17)	User point of view on milk statistics	PM
WG MILK	16/17-FEB-2016	8	Milk Market Observatory - one step forward to greater transparency	PPT	ANI_WG_2016-1-08_MMO.pptx		Modern uses and re-dissemination of milk statistics by the MMO	BM
Regional milk production								
WG MILK	20/21-DEC-2000	6	Regional statistics on milk production	DOC	ASA/TE/427	4	Investigations on feasibility of estimating regional milk collection.	FZ

Group ¹²		Meeting date		Item and Title		Doc. type	Doc. Number	Pages ¹³	Short description	Author ¹⁴
Structure of the dairy enterprises										
WG	MILK	01/02-JUN-2004	3.5.	Structural surveys		DOC	ASA/TE/M/565	1	For integration of structural data in business statistics	AA
Supply balance sheets										
WG	MILK	20/21-DEC-2000	7	Milk supply balance sheets		DOC	ASA/TE/428	5	Improving the 1984 methodology of milk SBS?	FZ
WG	MILK	26/27-JUN-2003	5	Revision of the methodology of the supply balance sheets for milk.		DOC	ASA/TE/M/517-rev.1	2	Plans for launching investigations	YZ
WG	ANI	12/13-MAR-2008	3.6	Supply balance sheets		DOC	ASA/TE/F/637	5 (13)	Statements for further developing SBSs	RAD
WG	ANI	28/29-APR-2009	3.5	SBS Manual - milk		DOC	ASA/TE/F/656	7 (3)	Handbook on SBS	RAD

Annex II – Policy needs

Needs served by the EU statistics on milk and milk products
as reported by Directorate General on Agriculture and Rural Development
Milk data needs

1. Needs served by the EU statistics on milk and milk products

The needs for statistical information on milk and milk products for the Directorate General on Agriculture and Rural Development (DG AGRI) can be summarised as follows.

Monitoring (A), ensuring transparency (B), forecast (C) and providing background (D), specialised information (E) or economic analysis (F)

require

objective, publicly available and checkable, harmonised information on production of milk and milk products at EU level

which frequency and timeliness meets the appropriate needs for short or medium term information

A. **Monitoring** of the milk market evolution to support policy decisions (e.g. to activate market intervention mechanisms or to conceive exceptional measures).

1. Market monitoring: for the monthly Committee for the Common Organisation of the Agricultural Markets meetings of the Milk Market Observatory Economic Board and the Civil Dialogue Groups, the monthly figures are used to prepare market situation presentations and published in the Milk Market Observatory website:

- 1.1. https://ec.europa.eu/agriculture/sites/agriculture/files/market-observatory/milk/pdf/market-situation-slides_en.pdf

- 1.2. http://ec.europa.eu/agriculture/market-observatory/milk/reports/mmo-meetings_en.htm

2. Internal monthly market situation note prepared each month before the CMO committees.

3. Internal Animal products monthly newsletter published on the DG AGRI Intranet by the end of the month

https://myintracomm.ec.europa.eu/dg/agri/policy/agri_markets/Pages/animal_products.aspx
(Internal commission access only).

B. **Transparency:** Providing the policy makers, **the dairy sector** and the citizens with more transparency by means of disseminating **market data** and short-term analysis in a timely manner.

4. The Milk Market Observatory

http://ec.europa.eu/agriculture/market-observatory/milk/index_en.htm

re-disseminates the milk production statistics and publishes

- 4.1. regularly updated statistics on production:

http://ec.europa.eu/agriculture/market-observatory/milk/latest-statistics/productions-stocks_en.htm

- 4.2. Weekly dairy market dashboard, including all most relevant data on production, prices and trade: http://ec.europa.eu/agriculture/market-observatory/milk/pdf/dashboard-dairy_en.pdf

- 4.3. Monthly factsheet on milk market situation e.g latest:

https://ec.europa.eu/agriculture/sites/agriculture/files/market-observatory/milk/pdf/market-situation-presentation_en.pdf

5. In the frame of the short-term outlook publication, 3 times a year, the underlying information production details by MS (annual production of milk and dairy products used to produce EU balances) is published in Excel format, the main data sources are Eurostat annual production figures completed by own estimates:
https://ec.europa.eu/agriculture/markets-and-prices/short-term-outlook_en
 6. Use of MS annual production figures as weighting factors of EU price averages.
- C. Providing the **policy makers** with **relevant forecasts and projections** on the future of production sectors in the **short and medium-term**.
7. In order to elaborate short-term forecasts (current year N and year N+1), published three times a year (https://ec.europa.eu/agriculture/markets-and-prices/short-term-outlook_en) and updated for almost each Milk Market Observatory
 8. Once a year, for the elaboration of the medium-term outlook (10 years), the database underlying the modelling exercise is updated based on the Eurostat annual production figures. This is also the database sent together with our projections for the EU to the OECD-FAO as contribution to the elaboration of the World Agricultural Outlook.
 9. The short term outlook (published 3 times a year) and medium term outlook (annual publication): for the historic figures annual data are used. For the on-going year, not yet available in the annual statistics, the change relative to the previous year is estimated based on the monthly figures. Those two publications are available online at http://ec.europa.eu/agriculture/markets-and-prices/index_en.htm
- D. Providing the **policy makers** with relevant **background** information on the **countries** to feed the various analysis and scenarios on policy measures in the medium-term.
10. Internal DG AGRI fact sheets per Member State (for briefings, presentations, ...)
 11. Contribution for example to the background information when the Russian ban was introduced, to assess which country could be potentially affected
(see https://ec.europa.eu/agriculture/russian-import-ban/market-data_en)
 12. Distribution of support envelope (previously quota data was used, but in the future annual milk production by MS might be used) for specific policy schemes.
- E. Providing the policy makers with **specialised information** to feed the discussions on the national or regional situation in the medium-term.
13. Many ad-hoc requests (internal or external) on EU / Member States productions (current and historical), on EU farms structure and also on regional productions. e.g.
http://ec.europa.eu/agriculture/evaluation/market-and-income-reports/eu-beef-labelling-rules_en.htm,
http://ec.europa.eu/agriculture/evaluation/market-and-income-reports/article-68_en.htm
 14. The change in regional distribution of milk production is of particular relevance to the debate on CAP especially after the milk quota system was removed given the fear of strong relocation of production.
- F. **Economic and policy analysis** supporting coherent policy management in the shorter and medium-term
15. Any evaluation or impact assessment of market measures for example requires accurate annual and monthly production figures of milk production but also dairy products (intervention applies to SMP and butter, private storage was used also for cheese).

Table 1 summarises how the statistics on milk and milk products collected by Eurostat meet, or could meet, the DG AGRI needs. Further to the above needs, the Eurostat explanations on the role of some statistics for guaranteeing coherence have been displayed.

Table 1: Correspondence between the blocks of statistics produced and the needs.

	Market monitoring	Market transparency	Production forecast	Background information	Specialised information	Economic and policy analysis	Ensuring quality of statistics
	A	B	C	D	E	F	
[a] Cows' milk collection (monthly)	+++ (main target)		+++ (early availability)				
[b] Dairy products produced (monthly)	+++ (main target)		+++ (early availability)				+
[c] Milk collection by species (annual)	+ (completeness)		+++ (main target)				+
[f] Dairy products produced (annual)	++	+++	++	+++			++
[i] Differences and losses							+++
[j] Raw milk production	+++						
[w] Regional cows' milk production				+++	++		+
[o] Other utilisation on farms				++			+++
[p] Farm milk products				++	+++		+
[all] Coherence pool				+			+++
Calves born in dairy herds	++	+++					+

+++ critical, ++ important, + useful

1 List and definition of milk and milk products

1.1 Products and definitions

Annex I of Decision 97/98/EC provides the list of milk products and their definitions.

Eurostat disseminates now the milk statistics based on another coding than the legal one. Eurostat provided a mapping between both lists. The definitions of the milk products derived from the Decision are also available in Document ASA/TE/704-rev4 (2015)

In DG AGRI view the following amendments are required:

- The list should also cover new products like cheese analogues, fat-filled milk powders, and demineralised whey and, more recently identified, separate whey protein concentrates
- We regret the lack of harmonisation of the list of codes with the other statistics, especially the combined nomenclature. The 2006 proposal should be used for better coherence.
- The definition of drinking milk should be amended in line with Regulation (EU) No 1308/2013.
- The measurement of whey quantities should be in equivalent powdered whey, in line with the market.

The definitions should not be limited to the only products, but also to the flows of raw milk and milk products. For instance, inclusion and exclusion of exchanges with foreign countries should be explicitly mentioned. In a context of dairy quota expiry, the collection of information regarding milk production by Member States versus milk collection by first purchasers revealed more complex with serious risks of double counting or missing information: how can Member States ensure completeness of milk production statistics without a survey of agricultural holdings with the development of cross-border milk collection. Harmonisation in the definition/status of collection centres appears necessary.

The Directive defines 'dairy enterprises' and refers to 'manufactures of dairy products' but the word 'dairies' is used in some parts of the Decision. DG AGRI would prefer either using the same wording in both acts or defining each of them.

2 Quality of the collected data

Milk statistics are governed by Directive 96/16/EC and Decision 97/80/EC. They are disseminated by the Eurostat through the so-called Eurobase database.

DG AGRI noticed a clear improvement in the quality of the milk statistics disseminated by Eurostat and more regular delivery by the member States, although some of them are regularly late. The issues reported by DG AGRI have been better managed since 2015. The overall assessment of quality in milk statistics is not so much related to the legal acts (with exceptions regarding clarity, see below) than to their implementation by Eurostat and most of all by Member States. DG AGRI reports regularly issues which Eurostat and the Member states contribute to resolve, but there are always new ones appearing while old ones re-appear.

2.1 Coverage

Article 2 of directive 96/16/EC defines the dairy enterprises as, Article 2 (2), the collection centres and, Article 2 (1), those enterprises purchasing milk from them or from agricultural holdings.

Several (if not all) Member States report also on enterprises purchasing milk from those in Article 2(2) or, in general, producing any milk product. The definition in Article 2 looks insufficient.

In the DG AGRI view, the definition in Article 2 should be improved.

Article 5(1) of directive 96/16/EC states that the surveys shall be exhaustive in the case of dairies accounting for at least 95% of the cows' milk collected, the balance being estimated on the basis of representative samples or other sources.

Only the dairies collecting cows' milk can be represented with these requirements. This is fine for Table A although implementation is diverse, some Member states covering also the dairy processing milk but not collecting it. But this is insufficient regarding production of dairy products and agricultural holdings.

In the DG AGRI view, more detailed requirements should be provided.

2.2 Transmission deadlines

DG AGRI welcomes the annual compliance exercise conducted for the Working Group meeting. Eurostat has published more timely statistics in the recent years. But some Member states are nevertheless regularly late. Furthermore efficiency of the exercise is limited by reporting once a year about data due nine months earlier or monthly. Regarding the only milk statistics, an annual exercise should also be conducted in October or November.

In the DG AGRI view, no amendment to the deadlines is needed.

2.3 Categories, Precision, Regional statistics

The categories of dairy enterprises are defined as structural tables D, E, F and G1 to G5 in annex II of decision 97/80/EC. The size classes have been amended in 2011.

In the DG AGRI view, no amendment to these categories is needed.

The precision requirements are laid down in Article 5(1) of Directive 96/16/EC as a sampling error not exceeding 1% of total national collection (with a confidence interval of 68%), for the only smallest dairies accounting 5% of the cows' milk collected.

In the DG AGRI view, no amendment to this precision limit is needed, but, as mentioned above, it should also be defined regarding dairies not collecting cows' milk.

The regional statistics are defined in Article 4(1) b v of Directive 96/16/EC. They cover production of cows' milk by NUST2 region. In combination with the livestock statistics provided under Regulation (EC) No 1165/2008, production of ewes', goats' and buffaloes' milk can be estimated. Article 4(1) refers to the surveys defined in article 1(1), of the units defined in Article (2), i.e. the dairy enterprises. Only the production delivered to the dairy enterprises can thus be caught by these statistics. Other uses on farms and delivery abroad are not covered.

In the DG AGRI view, the reference to Article 1(2) for the regional statistics would improve the resulting statistics. No further amendment is needed as long as regional dairy livestock is collected annually.

2.4 Completeness

Completeness of the statistics provided by the Member states is insufficient in the view of DG AGRI. If the idea of providing a handbook can improve the situation, it will be supported, but this seems rather due to a lack of efforts for providing them.

2.5 Clarity

One of the weaknesses of milk statistics is clarity, partly due to their complexity. The work done by Eurostat on the lists of codes improves the situation. Nevertheless, there are still cases where the definitions implemented by the Member States differ from the Decision definitions. Recommendations by Eurostat on the best practices for interpreting the data are welcomed. At least documentation on the various deviations could be a step towards harmonisation.

Clarity concerns:

- the legal texts themselves. They are really exhaustive in the definitions, but they also generate incoherence. Apparent incoherence in the data may be due to the national interpretation or to a real quality issue and this downgrades clarity.
 - the only list of milk products may be a weakness, as the role of raw products (collected from agricultural holdings) and intermediate products (exchanged between dairy enterprises) is crucial
 - the current definition of the dairy enterprises is inconsistent with what is actually covered by the member States
- the dissemination environment, where complex tables also accumulate obsolete cells (no longer disseminate for the recent years), impossible combinations of dimensions and optional status of some cells.
- the lack of analytical analysis giving added value to all the statistics and especially to the most tricky ones. DG AGRI understand now usefulness of the USM / UWM system, for ensuring constancy checks and for analysing uses of milk, but only since recently, thanks to the Eurostat efforts.

Eurostat collects a methodological report annually. The report looks no longer relevant for addressing the important issues, as far as a data user can understand. Efforts for improving quality refer especially to dissemination of the data and of the national methodologies.

3 Elements collected

3.1 Monthly statistics (Table A)

Article 4(1)a of Directive 96/16/EC introduces monthly surveys on (i) collection of cows' milk and cream and (ii) of the main dairy products. Earlier notifications have been introduced in Regulation (EU) No 1097/2014 on monthly cows' milk collection, overlapping in their definition with (i).

DG AGRI uses intensively these key statistics in the shorter term and as an estimate of annual statistics before their availability.

In DG AGRI view, statistics on milk product with a deadline at 45 days should be maintained or replaced by equivalent monthly statistics on uses of raw milk. Possibilities for other collection frequency could be analysed and discussed for improving efficiency of the statistical system.

In DG AGRI view, statistics on the number of calves born in dairy herds should contribute to better forecast the milk production. Ideally these statistics should be collected monthly with a deadline at 45 days. Whether these statistics should be covered by the milk statistics or the livestock statistics is left to the statistical lawyers.

3.2 Annual statistics on activity of dairies (Tables B and H)

Article 4(1)b,(i, ii and iii) of Directive 96/16/EC introduces annual surveys on (i) availability of milk and cream, (ii) of milk products available for delivery, (iii) on the use of raw materials and (iv) on the protein content of milk products. Decision 97/80/EC, Annex II, defines a table on availability and use of milk in the dairies (Table B) and one on protein content of cows' milk products (Table H). This statistics are due by the Member states on 30 June following the end of the reference year.

Table B is almost satisfying in its design. Earlier provisional results, possibly simplified, would improve significantly the value of these statistics. The statistics on protein content are almost not accessible.

DG AGRI uses as a by-product the quantities of used milk or of proteins. They contribute to the overall coherence and quality of the annual statistics, Eurostat explained. For this reason no amendment is needed in the DG AGRI view.

In DG AGRI view, efforts for fastening the statistical process on annual milk statistics could nevertheless be reflected in the legal acts.

3.3 Triennial statistics on the structure of dairy enterprises (Tables D to G5)

Article 4(1)c of Directive 96/16/EC introduces triennial statistics on the number of dairy enterprises broken down by size classes, as from 31/12/1997. Decision 97/80/EC defines eight tables on the enterprises collecting milk (Tables D and E), processing milk (Table F) and producing products from five groups of products (Tables G1 to G5). These statistics are due by the Member states on 30 September following the end of the reference year.

The total number of enterprises and information on concentration in the sector for interpreting these numbers are used by DG AGRI.

In DG AGRI view, no amendment is needed.

3.4 Annual statistics on dairy agricultural holdings (Table C)

Article 1(2) of Directive 96/16/EC introduces annual surveys on production and use of milk in agricultural holdings. Decision 97/80/EC defines the content of Table C. These statistics are due by the Member States by 30 September following the end of the reference year.

DG AGRI uses especially these statistics in order to build a complete view of milk production by comparison with collection/delivery and production of other milks than from cows. This table is important for economic analysis of milk production in agriculture. The table displays some variables which values are almost always at zero for exhaustiveness. This could be simplified if it represents a burden on the Member States, which does not seem to be the case.

In the DG AGRI view, no amendment is needed.

4 Frequency and timeliness

4.1 Frequency

As written above, the current frequency of the statistics is adequate, including the yearly frequency for the agricultural holding data (because it's used for the annual balance sheet) and the three-year period for the dairy structures.

Regional information on cows' milk production is not used in DG AGRI on a daily basis, but in some specific context or analysis, therefore, it is essential to keep this yearly survey.

When considering a possible change in the monthly collection of milk statistics to resolve the overlap with Regulation (EU) No 1097/2014, collection frequency should not impact granularity.

In the DG AGRI view, monthly transmission of statistics contributes to the daily activity of the national services. Only in the case they would no longer publish monthly data, monthly transmission to Eurostat could be seen as useless burden. The pressure for obtaining timely statistics at the deadline constitute, the Member states told in the working Group, a more burdensome factor than the frequency itself.

4.2 Timeliness

Given the need to monitor very closely the developments of the monthly milk market, especially in a context of increased volatility, DG AGRI would like to stress again how important timeliness is crucial to DG AGRI. Regularly the data available in Eurostat is completed with national information available online. Sometimes only a trend is retrieved from these sources when the survey is not directly comparable (e.g. Germany) but for other Member States (the NL e.g.) the figure is directly comparable.

In conformity with a gentlemen's agreement reached with Eurostat, a majority of Member States are engaged to submit their monthly statistics within a shorter deadline. As reported by Eurostat in last Working party on animal statistics (DOC. ASA/TE/743-rev2), some Member States would have met 100 % of the agreed deadlines while others could not make it. Despite the efforts shown by some national administrations and the legal timeframe established in the Directive, there are some Member States which systematically overlook the deadlines.

This is not entirely satisfactory.

5 Confidentiality

The current rules regarding confidentiality limit significantly the accuracy of the data and the market analysis that can be made.

DG AGRI will strongly support any initiative by Eurostat to increase the number of aggregate EU figures to be published and especially for the EU-28 as already initiated for 2011 and 2012 as described in the proposal for changes of the current draft confidentiality chapter in animal production statistics (document ASA/TE/734). This method already shows a significant improvement for the EU aggregates.

5.1 Confidentiality charter

In the working party on animal production statistics dated 11/03/2015 (DOC. ASA/TE/743-rev2), Eurostat reported on the final draft version of the charter, (1) taking into account the comments received and (2) proposing the missing pieces for an overall coverage of the confidentiality cases presented. The roadmap for approval of the charter was presented aiming a final approval by the ESSC in November 2015 after opinion of the DGAS in June 2015 and of the EGSDC.

Member States welcomed the proposed Confidentiality Charter but asked for additional time to check the proposed charter. In particular attention was drawn on the methods described in the draft confidentiality, page 7-8, to check the risk of disclosure and/or to estimate the metrics required for assessing confidentiality, especially M5 “One cell, one unit” as well as Confidentiality Case 8 referring to Transnational firms.

6 Data checks / additional calculations

6.1 Data validation

In the working party on animal production statistics dated 11/03/2015 (DOC. ASA/TE/743-rev2), Eurostat presented the progress made especially in the Task Force on validation of animal production statistics, the linkage to the ESS.VIP Validation and its recommended VTL (Validation and Transformation Language). Eurostat announced that a further grant programme will be launched in coming weeks to start cooperation with volunteering countries on investigations concerning data validation in animal statistics.

Member States, especially Task Force members (i.e. DE, HU, IT, PL and RO) will continue to investigate on developing a sound data validation process for animal statistics and next Task force meeting is planned to take place on 24 and 25 June. Countries will consider eventual participation in co-financing programme concerning data validation in 2015 in the framework of Eurostat’s fixed objectives to be served.

DG AGRI fully supports this exercise of data validation.

6.2 Data checks for consistency

The data checks for consistency of the different tables conducted by DG AGRI highlights differences. This illustrates the need for further work on data validation to draw benefit of the system described by Eurostat.

Annex III – Glossary

Used milk: Used milk is the quantity of milk, whole (noted UWM) or skimmed (noted USM), used in the processes.

USM: Used skimmed milk (see used milk).

UWM: Used whole milk (see used milk).

Raw milk: Milk produced by secretion of the mammary glands of one or more cows, ewes, goats or buffaloes, which has not been heated beyond 40 °C or undergone any treatment that has an equivalent effect.

Raw materials: Especially raw (whole) milk, but also raw cream formed *naturally on the surface of the milk by slow agglomeration of emulsifying fat globules* and the resulting raw skimmed milk. As long as raw materials are not heated, transformed physically or chemically or processed otherwise, or packed in containers suitable for retail trade, they remain raw materials.

Dairy materials: Dairy materials includes, further to raw materials, all the materials or intermediate products exchanged between the dairy enterprises in a country and considered as subject to double counting, in the sense of statistical activity referred to in Article 5(2) b of the Directive. They are described as "raw materials or products" in the second paragraph of Explanatory notes on Table B in Annex II of the Decision, but this concept is used wider than for the only calculation of Table B. For the purpose of this document, they are called **dairy materials**.

Milk consumption products: dairy products excluding dairy materials.

The Directive: Directive 96/16/EC.

The Decision: Decision 97/80/EC.

Collection: First transfer from an agricultural holding to a dairy enterprise.

Dairy (noun): ambiguous, either a dairy enterprise or the national dairy.

Collection centre: Undertaking purchasing whole milk or cream from agricultural holdings but not processing it (see 2.1.1).

Dairy enterprise: Collection centre or undertaking purchasing whole milk (or, in certain cases, milk products) from the agricultural holdings or the collection centres with a view to transforming them into milk products (see 2.1.1).

National dairy: The frame of individual dairy enterprises in a country, considered for the purpose of analysis as a single entity.

CMO: Common Market Organisation.

MMO: Milk Market Organisation.

CAP: Common Agricultural Policy.

obs_value, obs_status, obs_conf: the fields receiving respectively the measured value and the flags on status and confidentiality.

EU: European Union.

Annex IV – Legal references

1. EU legislation

Statistics of milk and milk products

Council Directive 96/16/EC of 19 March 1996 on statistical surveys of milk and milk products

Consolidated version: <http://data.europa.eu/eli/dir/1996/16/2014-01-10>

Commission Decision of 18 December 1996 laying down provisions for the implementation of Council Directive 96/16/EC on statistical surveys of milk and milk products

Consolidated version: [http://data.europa.eu/eli/dec/1997/80\(1\)/2011-03-24](http://data.europa.eu/eli/dec/1997/80(1)/2011-03-24)

Statistical law

Regulation (EC) No 223/2009 of the European Parliament and of the Council of 11 March 2009 on European statistics

and repealing Regulation (EC, Euratom) No 1101/2008 of the European Parliament and of the Council on the transmission of data subject to statistical confidentiality to the Statistical Office of the European Communities, Council Regulation (EC) No 322/97 on Community Statistics, and Council Decision 89/382/EEC, Euratom establishing a Committee on the Statistical Programmes of the European Communities (Text with relevance for the EEA and for Switzerland)

Consolidated version: <http://data.europa.eu/eli/reg/2009/223/2015-06-08>

Hygien package

Regulation (EC) No 852/2004 of the European Parliament and of the Council of 29 April 2004 on the hygiene of foodstuffs

Consolidated version: <http://data.europa.eu/eli/reg/2004/852/2009-04-20>

Regulation (EC) No 853/2004 of the European Parliament and of the Council of 29 April 2004 laying down specific hygiene rules for food of animal origin

ELI: <http://data.europa.eu/eli/reg/2004/853/oj>

Regulation (EC) No 854/2004 of the European Parliament and of the Council of 29 April 2004 laying down specific rules for the organisation of official controls on products of animal origin intended for human consumption

Consolidated version: <http://data.europa.eu/eli/reg/2004/854/2017-01-01>

Organic production

Council Regulation (EC) No 834/2007 of 28 June 2007 on organic production and labelling of organic products and repealing Regulation (EEC) No 2092/91.

ELI: <http://data.europa.eu/eli/reg/2007/834/oj>

Commission Regulation (EC) No 889/2008 of 5 September 2008 laying down detailed rules for the implementation of Council Regulation (EC) No 834/2007 on organic production and labelling of organic products with regard to organic production, labelling and control.

Consolidated version: <http://data.europa.eu/eli/reg/2008/889/2018-01-01>

2. National measures implementing Directive 96/16/EC

Member State	National implementing measures (as communicated to the Commission)	Date
BE	Koninklijk besluit van 22 december 2017 tot wijziging van het koninklijk besluit van 25 april 2013 betreffende statistische enquêtes inzake de melk en de zuivelproducten 22 DECEMBRE 2017. - Arrêté royal modifiant l'arrêté royal du 25 avril 2013 relatif à des enquêtes statistiques dans le domaine du lait et des produits laitiers. Publié le : 2018-01-25. Numac : 2017014416	04/10/1997
BG	Наредба за статистическите изследвания, провеждани в свиневъдството, говедовъдството, биволовъдството, овцевъдството, козевъдството и в производството на месо, мляко и млечни продукти	17/11/2006
CZ	Zákon č. 89/1995 Sb., o státní statistické službě Zákon č. 411/2000 Sb., kterým se mění zákon č. 89/1995 Sb., o státní statistické službě, ve znění pozdějších předpisů, a zákon č. 582/1991 Sb., o organizaci a provádění sociálního zabezpečení ve znění pozdějších předpisů Vyhláška č. 77/2003 Sb., kterou se stanoví požadavky pro mléko a mléčné výrobky, mražené krémy a jedlé tuky a oleje Zákon č. 81/2004 Sb., kterým se mění zákon č. 89/1995 Sb., o státní statistické službě, ve znění pozdějších předpisů Vyhláška č. 355/2016 Sb., o Programu statistických zjišťování na rok 2017 Vyhláška č. 397/2016 Sb., o požadavcích na mléko a mléčné výrobky, mražené krémy a jedlé tuky a oleje	31/05/1995 29/11/2000 27/03/2003 25/02/2004 04/11/2016 12/12/2016
DK		
DE	Agrarstatistikgesetz in der Fassung der Bekanntmachung vom 17. Dezember 2009 (BGBl. I S. 3886), das zuletzt durch Artikel 1 des Gesetzes vom 5. Dezember 2014 (BGBl. I S. 1975) geändert worden ist Marktordnungswaren-Meldeverordnung vom 24. November 1999 (BGBl. I S. 2286), die zuletzt durch Artikel 1 der Verordnung vom 7. Februar 2018 (BGBl. I S. 192) geändert worden ist	
EL	Décret présidentiel numéro 323 du 16/09/1998 FEK A numéro 219 du 24/09/1998 Page 3221	24/09/1998
ES	Real Decreto número 2220/98 de 16/10/1998, por el que se aprueba el Plan Estadístico Nacional 1997-2000 Boletín Oficial del Estado número 261 de 31/10/1998 Página 35729 (Marginal 25037) Corrección de Erratas del Real Decreto número 2220/98 de 16/10/1998, por el que se aprueba el Plan Estadístico Nacional 1997-2000 (Marginal 26669)	31/10/1998

Member State	National implementing measures (as communicated to the Commission)	Date
FR		
HR	Metodološke osnove za prikupljanje podataka u statistici mlijeka i mliječnih proizvoda	07/05/2013
IT		
CY	Ο περί Στατιστικής Νόμος του 2000	04/02/2000
LV	Valsts statistikas likums	25/11/1997
	Ministru kabineta 2003.gada 16.decembra noteikumi Nr. 732 "Noteikumi par Statistiskās informācijas valsts programmu 2004.gadam"	24/12/2003
	Grozījumi Valsts Statistikas likumā	31/03/2004
	Noteikumi par Valsts statistiskās informācijas programmu 2006.gadam	05/07/2006
	Valsts statistikas pārskatu un anketu veidlapu paraugu apstiprināšanas noteikumi	10/11/2006
LT	Žemės ūkio ministro 2009 m. birželio 5 d. įsakymas Nr. 3D-416 „Dėl duomenų apie pieną ir pieno gaminius teikimo taisyklių patvirtinimo“	05/06/2009
	Oficialiosios statistikos 2018 metų darbų programa patvirtinta statistikos departamento generalinio direktoriaus įsakymu Nr. DĮ-295	28/12/2017
LU	Loi du 09/07/1962 portant institution d'un service central de la statistique et des études économiques Mémorial A Numéro 38 du 13/07/1962 Page 597	13/07/1962
NL	Wet van 18/04/1996, houdende een instellingsregeling voor het Centraal bureau en de Centrale commissie voor de statistiek (Wet op het Centraal bureau en de Centrale commissie voor de statistiek), Staatsblad nummer 258 van 14/05/1996 bladzijde 1	14/05/1996
	Werkprogramma 1997 en volgende jaren + Statistieken voor de 21-ste eeuw hoofdlijnen CBS meerjarenprogramma 1997-2000, Voorburg/Heerlen 1997	
HU	Act CLV of 2016 on Official Statistics	15/12/2016
MT	CHAPTER 422 MALTA STATISTICS AUTHORITY ACT	03/10/2000
AT	Verordnung des Bundesministers für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft über Meldepflichten in der Milchwirtschaft (Milchmeldeverordnung 2010 - MMV 2010), BGBl. II Nr. 249/2010. Änderungen: BGBl. II Nr. 235/2011, BGBl. II Nr. 86/2015.	29/07/2010
PL	ustawa z dnia 29 czerwca 1995 r. o statystyce publicznej.	31/07/1995
	Rozporządzenie Rady Ministrów z dnia 13 lipca 2004 r. w sprawie programu badań statystycznych statystyki publicznej na rok 2005	07/09/2004
	Rozporządzenie Rady Ministrów z dnia 19 lipca 2005r. w sprawie programu badań statystycznych statystyki publicznej na rok 2006	16/09/2005

Member State	National implementing measures (as communicated to the Commission)	Date
PT	Lei do Sistema Estadístico Nacional n. 6/89 de 15/04/1989. Diário da República I Série n. 88 de 15/04/1989 Página 1650	15/04/1989
RO	Ordin al președintelui Institutului Național de Statistică pentru stabilirea Metodologiei cercetărilor statistice lunare și anuale referitoare la producția de lapte și produse lactate (IND L), modulul industrie alimentară	20/01/2006
	Ordin al președintelui Institutului Național de Statistică pentru stabilirea Metodologiei ecrectării statistice privind efectivele de animale existente la 1 decembrie și producția animală obținută	20/01/2006
	Ordin al președintelui Institutului Național de Statistică privind modificarea și completarea anexei la Ordinul președintelui Institutului Național de Statistică nr.1224/2005 pentru stabilirea metodologiei cercetărilor statistice lunare și anuale referitoare la producția de lapte și produse lactate (IND L), modulul industrie alimentară	02/06/2006
SI	Navodilo za izvajanje statističnih raziskovanj mleka in mlečnih izdelkov	27/05/2005
SK	Vyhláška Štatistického úradu Slovenskej republiky č. 482/2005 Z. z., ktorou sa vydáva Program štátnych štatistických zisťovaní na roky 2006 až 2008	31/10/2005
	Vyhláška Štatistického úradu Slovenskej republiky č. 416/2008 Z. z., ktorou sa vydáva Program štátnych štatistických zisťovaní na roky 2009 až 2011	31/10/2008
	Vyhláška Štatistického úradu Slovenskej republiky č. 540/2009 Z. z., ktorou sa mení a dopĺňa vyhláška Štatistického úradu Slovenskej republiky č. 416/2008 Z. z., ktorou sa vydáva Program štátnych štatistických zisťovaní na roky 2009 až 2011	18/12/2009
	Vyhláška Štatistického úradu Slovenskej republiky č. 358/2011 Z. z., ktorou sa vydáva Program štátnych štatistických zisťovaní na roky 2012 až 2014	27/10/2011
	Vyhláška Štatistického úradu Slovenskej republiky č. 291/2014 Z. z., ktorou sa vydáva Program štátnych štatistických zisťovaní na roky 2015 až 2017	23/10/2014
	Vyhláška Štatistického úradu Slovenskej republiky č. 250/2017 Z. z., ktorou sa vydáva Program štátnych štatistických zisťovaní na roky 2018 až 2020	20/10/2017
FI	Maa- ja metsätalousministeriön päätös maitoa ja maitovalmisteita koskevien tilastotietojen keruusta annetun neuvoston direktiivin täytäntöönpanosta (725/97) 24/07/1997	30/12/1996
SE	Statens jordbruksverks föreskrifter om uppgiftslämnande för statistiska undersökningar av mjölk och mjölkprodukter, Statens jordbruksverks författningssamling SJVFS) 1997:80	
	Lag om ändring i lagen (1992:888) om uppgiftsskyldighet på jordbrukets och fiskets områden, Svensk författningssamling SFS) 1997:199	
UK		

Annex V – Coherence of the statistical tables

1 Description

The statistics on milk and milk products were designed by Directive 96/16/EC as monthly, annual and triennial statistics on the dairy enterprises and annual statistics on the dairy agricultural holdings. Decision 97/80/EC defines 13 tables covering these various roles.

- Monthly collection of cows' milk and production of the main products (Table A),
- Annual statistics on activity of the dairy enterprises (Tables B and H)
- Annual statistics on activity of the dairy farms (Table C)
- Triennial statistics on the structure of the dairy enterprises
 - Milk collection directly by the processing dairy enterprises (Table D) or through collection centres (Table E),
 - Milk used by the dairy enterprises (Table F) and
 - Production of the main milk products (Tables G1 to G5)
- Regional statistics on production of cows' milk (Table I)

Two tables are designed like balance sheets, guaranteeing coherence between availabilities and use of milk, Table B on the dairy enterprises and Table C on the farms.

A description of the various pieces designed in the set of EU tables explicitly required by Decision 97/80/EC or implicitly defined for establishing the figures collected can be inventoried in blocks of information as follows (Table 3).

Table 3. Blocks of information in the set of statistical tables

Table	Item
A	a. Collection: cows' milk and cream (quantities, fat and protein content in percent)
	b. Products: main products obtained (quantities)
Table B.A	c. Collection: Farm raw milk (quantities, fat and protein content)
	c1. of which cows' milk collection
	d. Other farm dairy products (quantities, fat content)
B.B and H	e. Import: Dairy materials (quantities, fat content)
	f. Products: (quantities, fat content, cows' milk protein content, USM, UWM)
	f1. Quantities of products from cows' milk
B.B	f2. Fat content and cows' milk protein content
	f3. Used milk: Whole and skimmed milk
	g. Export: Dairy materials (quantities, fat content, USM, UWM)
B.B	h. Utilisations: Dairy materials (skimmed milk and buttermilk) returned to farms (quantities, fat content, USM)
	i. Statistical differences and losses (fat content, USM and UWM)
	j. Availabilities – Raw milk production by species (quantities)
	k. Availabilities – Skimmed milk and buttermilk
	k1. Returned by dairies
	k2. Produced on farms
	l. Utilisations – Milk delivery to dairies
	l1. of which, delivery of raw milk
	m. Utilisations – Processing (USM and UWM)
	n. Utilisations – Other delivery to dairies (USM and UWM)
C	o. Utilisations – Other utilisations (USM and UWM)
	p. Products obtained
	q. Total – Milk collection
	r. Number of enterprises and their breakdown
D and E	s. Total – Milk processed
	t. Number of enterprises and their breakdown
F	u. Total – Products obtained
	v. Number of enterprises and their breakdown
G1 to G5	w. Regional data: Cows' milk production

These 30 blocks are connected one with some others and the quality of this connection build coherence of the statistical data set. The most important regarding their numbers of values refer to the dairy products and, depending on the Member State to the NUTS 2 regions.

The links are diversely strong as connections between pieces in different tables may refer to various frames and statistics tools. Therefore most of the time, the connected values are not expected to fit perfectly, but to have a rather stable relationship. Nevertheless, in the same table, stronger relationship between the variables is expected.

2 Particular statistical links

2.1 Within the tables

Within Table A the percentage of milk collection (a) reflected in the products obtained (b) must be stable. It should vary around 100% for the sub-frame of the dairy enterprises processing milk while the collection centres does not produce any product. Some products are not covered but their share in the total production may be considered either as stable or with limited seasonality. The changes in stocks contribute to volatile percentage of use. Finally any structural change in the distribution of the roles (collecting / processing) impacts also the relationship.

In Table B, the relationship reflects the share of cows' milk (c1) collected amongst all milks (c) collected from farms.

The statistical differences and losses in Table B are expected to be the discrepancy between the availabilities (c + d + e) and the other utilisations (f + g + h).

The relationship between the quantities (f1), the fat and protein content (f2) and the USM and UWM (f3) must meet coherence as described in 2.1.2.3.

Similarly the availabilities in Table C (j + k) are expected to be as the same level as utilisations (l + m + n + o).

The products obtained on the farms (p) are expected to be coherent with the milk used for their processing (m).

2.2 Between the tables

The annual total of the monthly results regarding cows' milk collection (a) are expected to fit with annual cows' milk collection in Table B (c1), with a discrepancy due to the statistical tool impact.

Delivery by agricultural holdings to dairies in Table C is expected to fit with dairy collection from agricultural holdings in Table B, for raw milk (resp. c and l) and other farm dairy products (resp. c and n), the discrepancies reflecting differences between the national sets of statistical units and the actual partners of the reporters. Cross-border milk collection / delivery is especially concerned.

Similarly return to farms by dairies as reported by the dairy enterprises in Table B (h) and the agricultural holdings in Table C (k1) is expected to fit, with a possible discrepancy in the frame.

Total milk collection, as reflected in tables D and E (q) must be coherent with the milk collection in Table B (c).

Total quantity of milk processed by the dairy enterprises as reflected in tables F (s) must be coherent with the milk processed in Table B (c + d + e).

Total quantity of main products obtained in Tables G1 to G5 (u) must be coherent the various relevant quantities reported in Table B (f).

Finally the confidentiality cases (small number of dairy enterprises or dominance of some of them) reported in Table B and H must be supported by the distribution described in Tables D to G5 (r, t and v).

2.3 With other statistics

Import of dairy materials and other products (e) and export of dairy materials (g) by the dairy enterprises is expected to be reflected in the foreign trade statistics.

Milk production by species in Table C (j) is expected to be coherent with the dairy (and non-dairy) livestock.

Regional cows' milk production (w) is expected to be coherent with the national production reported in Table C and with the regional distribution of the number of dairy and non-dairy cows.

The numbers of enterprises in Tables D to G5 (r, t and v) are expected to be coherent with the business statistics.

The volumes of production reported in Tables B and C must be coherent with the national accounts.

At national level, further data sets may be correlated with statistics on milk and milk products , like the Supply Balance Sheets.

2.4 Analyse of the content

Finally, after identifying the above particular pieces, the tables can be described like on [Figure 2](#), referring mainly to three kinds of concepts, and their links like on [Figure 3](#).

Figure 2: Blocks of information in statistics on milk and milk products

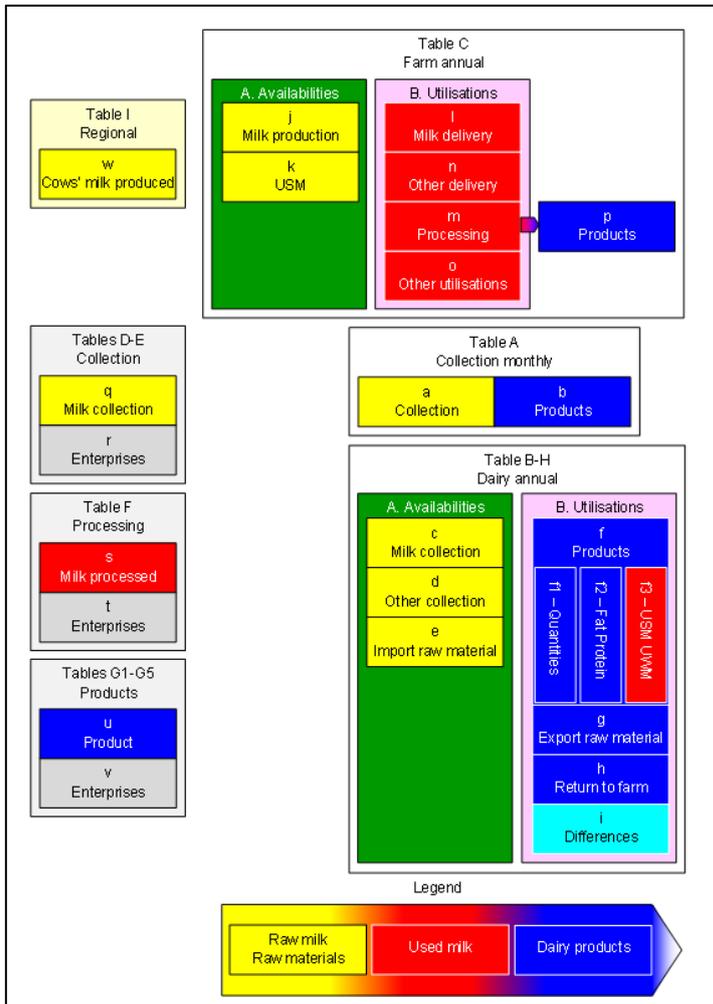
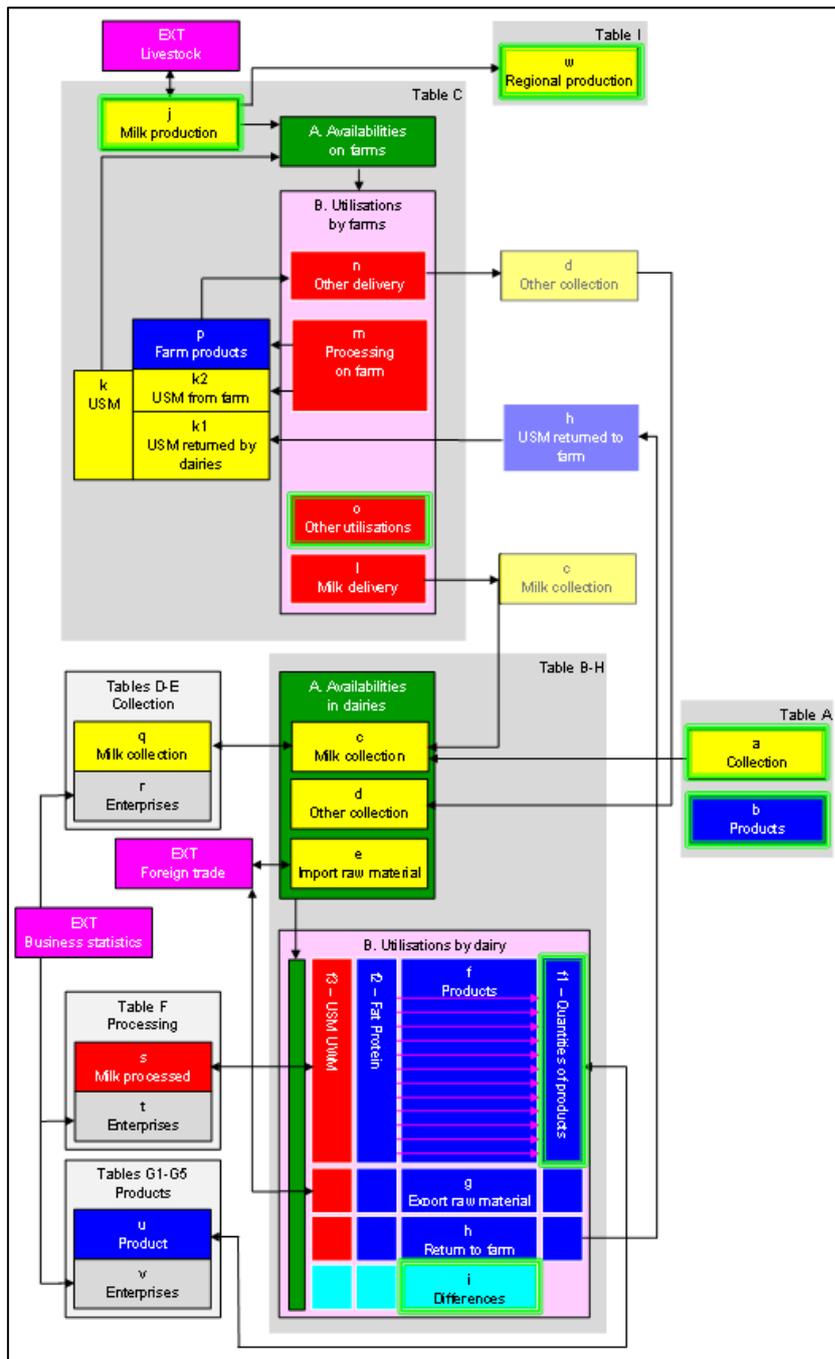


Figure 3: Links between blocks of information in statistics on milk and milk products



A graph analysis enables identifying the blocks connecting the other blocks and the orphan blocks (a single link) fed by the previous ones:

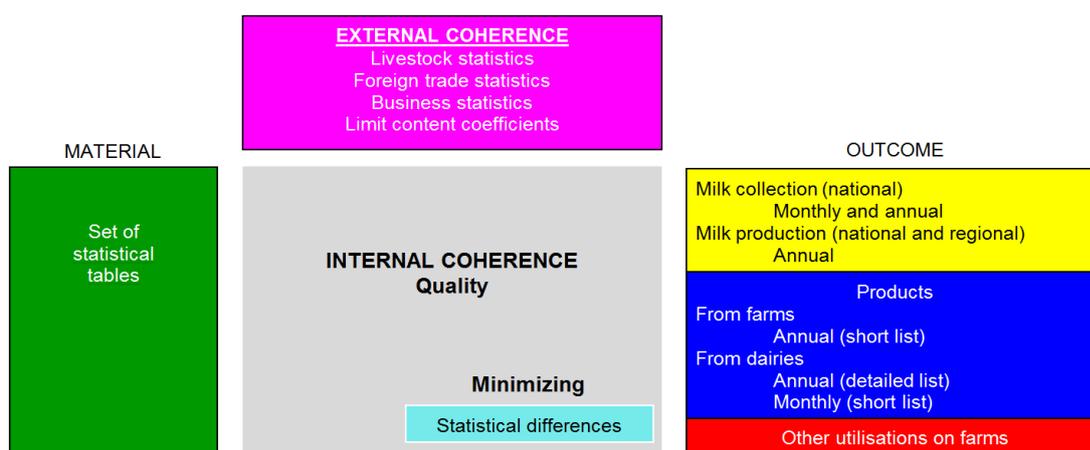
- Seven main indicators, displayed with a green border, i.e. national milk production for the various milks (j), regional production of cows' milk (w), other utilisations on farms (o) (own-consumption, direct sales of milk and products, feed), monthly cows' milk production (a) and production of main products (b), various quantities of dairy products (f1), and the differences and losses (i);
- Four external constraints from livestock statistics, business statistics, foreign trade statistics (purple boxes) and from the set of plausible fat and protein content rates (purple arrows);
- 23 other blocks enabling to produce the main indicators while ensuring their compliance to external constraints as well as their internal coherence;
- Further blocks of information out of the explicit legal EU requirements are nevertheless part of their implementation. These are especially (1) those dedicated to management of the internal flows between national dairy enterprises and of foreign exchanges and (2) the additional data on milks from dairy ewes, goats and buffaloes. The set of university studies providing sets of parameters or of data from other sources used for checking could also be considered.

2.5 Conclusion

When re-organising this description, the objectives of statistics on milk and milk products become:

- Providing the annual milk production for the four main EU dairy species and the quantities of dairy products (and of dairy materials exported) produced from this milk (and from imported dairy materials) by the dairy enterprises and by the dairy agricultural holdings;
- Providing monthly information on the cows' milk collected and on the main dairy products obtained from it;
- Providing regional distribution of cows' milk production;
- Guaranteeing coherence for the whole set of tables by stating how the statistics on availabilities and utilisation of milk draw a balanced picture.

Figure 4: Summary design



Annex VI – Definition of the statistical units (dairy enterprises) and of dairy materials

The design of data collection and processing is shaped by the statistical frame (enterprises to be represented in the statistics). The definition of the statistical units (dairy enterprises) interacts with the way of considering internal flows between these enterprises. The purpose is indeed accounting the dairy input and output of the national dairy sector, i.e. summing up the individual input and output but while keeping aside output of a dairy used as input for another dairy. The definition of the materials considered as input for the dairy process also contributes to the level of complexity of the statistical system.

1 Definition of the dairy enterprises

Article 1 of Directive 96/16/EC, refers to two statistical frames, the units specified in Article 2 and the agricultural holdings.

1.1 Legal definition

The statistics on dairy enterprises defined in Article 2 refer to Directive 96/16/EC and Decision 97/80/EC. In this framework, these are especially Tables A, B and H, i.e. monthly statistics on collection of raw cows' milk and on production of the main products and annual statistics on availabilities and uses of milk by the dairy enterprises and on cows' milk protein in the milk products. Tables D to G on the structure of dairy enterprises are also referred to as they are grounded on activity of the dairy enterprises.

Article 2

The surveys referred to in Article 1 (1) shall cover:

1. undertakings or agricultural holdings which purchase whole milk or, in certain cases, milk products, either directly from agricultural holdings or from the undertakings referred to in point 2, with a view to transforming them into milk products;
2. undertakings which collect milk or cream in order to transfer it in whole or in part, without any processing, to the undertakings referred to in point 1.

Member States shall take all appropriate measures to prevent duplication of results as far as possible.

1.2 Direct interpretation

Article 2 defines two types of enterprises:

- The collection centres defined in Article 2 (2)
 - collect, from the agricultural holdings, milk or cream to transfer it to the other dairy enterprises
 - WITHOUT processing;
- The other dairy enterprises in Article 2(1)
 - Purchase whole milk or milk products (1) from agricultural holdings or (2) from the collection centres
 - AND process this material into milk products.

An undertaking processing dairy products but not purchasing milk or milk products from any agricultural holding or collection centre should not be considered, when referring to this definition.

A first understanding of this definition would consist identifying

- The agricultural holdings producing milk (and cream)
- The undertaking collecting their milk (and/or cream) and, among them,
 - Those producing dairy products (Article 2 (1)) and
 - Those not producing dairy products (Article 2 (2)).

The dairy enterprises would thus be those purchasing milk (and/or cream) from the agricultural holdings or from the collection centres. The collection centres can deliver cream and therefore the skimmed milk is also to be considered.

An agricultural holding can also be considered as a dairy enterprise if it purchases milk from other agricultural holdings or from collection centres.

1.3 Revised interpretation

Nevertheless when a dairy enterprise purchases milk (or cream) from the agricultural holdings and processes only a part of it, the other part being transferred to any other undertaking, it combines activities of Article 2 (1) and 2 (2). Table A considers raw milk and cream as a possible outcome, but not Table B.

In order to solve this issue, the definition needs to be enlarged as follows. A dairy enterprise purchases non-processed milk, cream or skimmed milk from the agricultural holdings, the collection centres, or another dairy enterprise. The flows of non-processed milk materials define a framework of dairy enterprises.

The natural separation of skimmed milk and cream is not considered as production of dairy products. Whole milk, skimmed milk and cream are particular products as their exchange contributes to identify the dairy enterprises. The legislation does not provide an explicit definition of the set of *raw materials or products* to be considered as non-processed, except that they are *normally provided in bulk* (Decision 97/80/EC).

This interpretation is validated by the practices in the Member States. From a legal point of view, a country could interpret more strictly the legal definition. The difficulty would be met afterwards to *prevent duplication of results*. Therefore there is a consensus on soundness and efficiency of the above interpretation.

1.4 Extended interpretation

An even wider interpretation can draw benefit of the weak definition of dairy materials and extend it to all products which are normally provided in bulk, i.e. almost all products with the exception of those packed individually. In such an approach, whereas simple packing is not considered as processing, it is finally considered as the latest stage of production for dairy products. This approach is supported by the scope of Tables G1 to G5, which covers all the dairy enterprises producing at least one of the five main (groups of) products, i.e. Fresh products (G1), Drinking milk (G2), Powdered dairy products (G3), Butter (G4) and Cheese (G5).

1.5 Conclusion

The definition of the dairy frame is closely linked with the lists of products considered. Regarding the list of dairy products (output), the legislation is explicit. But the relationship between the farm raw products and the definition is flexible and leaves range for national interpretation.

The reference to the business statistics in the methodological report (Decision 97/80/EC, Annex III).

Subsidiarity left in the Directive, i.e. minimum requirements possibly extended, makes compliant with the EU legislation this approach while quite far from the direct definition. In this particular legal context, an extended definition is *in addition to* and not *in contradiction with* the legal definition.

There is thus a wide range of couples of definitions for both dairy material and dairy, from the direct interpretation to the extended definition. Every national approach can thus be qualified relatively to its position between these extreme positions.

2 Dairy materials

The definition of the dairy enterprises is closely linked with the list of raw materials or products (dairy materials) considered as exchanged between the dairy enterprises, i.e. used as input by them.

The *raw materials* are not processed on the agricultural holding nor since they have been collected from the agricultural holding. Processing covers packing, and therefore raw milk delivered in small containers (e.g. 1 litre) is not considered as raw material (but as drinking milk). The only products concerned out of raw milk result from the natural agglomeration of fat on the surface of milk, i.e. cream and skimmed milk. Therefore **milk, cream and (liquid) skimmed milk in bulk** are basically the only **raw materials** considered by the statistics on milk and milk products. In that sense, the skimmed milk includes the partly and the fully skimmed milk.

A wider definition can also be considered as the bulk storage, especially of skimmed milk powder and butter oil, is not intended to provide dairy products but dairy materials to be reused in the processes. The buttermilk resulting from preparation of butter oil is also covered. These **milk storage materials** maybe considered in the flows between dairy enterprises. In counterpart, considering them as *dairy material* implies recording their stocks.

The set of dairy materials can also be extended to most of the dairy products in bulk. This wider interpretation leads finally to identify the dairy enterprises based on the products resulting from their processes. This approach enables to better handle the list of dairy enterprises but requires considering a finite list of dairy products, especially for *other fresh products* and *other manufactured products*. This later interpretation is in contradiction with the legal definition because it does not refer to the *purchasing raw milk* activity as a condition but, when considering it as a minimum requirement, considering all **intermediate products** is still sound.

An **example** can better illustrate the issue. On Figure 5, three cases illustrate various ways to describe the dairy sector from the same situation (a). When applying the minimum requirements (b) two collection centres and 10 dairies are identified when referring only to purchasing raw milk and cream, from agricultural holdings or not. When extending the scope of the dairy materials considered, for instance by considering also skimmed milk powder (c), three additional enterprises are considered and the milk powder they purchase is no longer considered (double-account), which is compensated by covering their production. Finally when identifying the dairy enterprises bases on their economic activity of production of milk products (d) another additional enterprise is considered, for instance processing partly-skimmed milk into yogurts.

Where the definition of dairy sector is wider, production is more complete and accurate but the risk for mis-handling the internal flows increases. The minimum requirements limit the survey size and provide a better picture of the actual milk processing activity while management of dairy materials is clearer.

Figure 5: Relation between definition of dairy material and of dairy enterprises

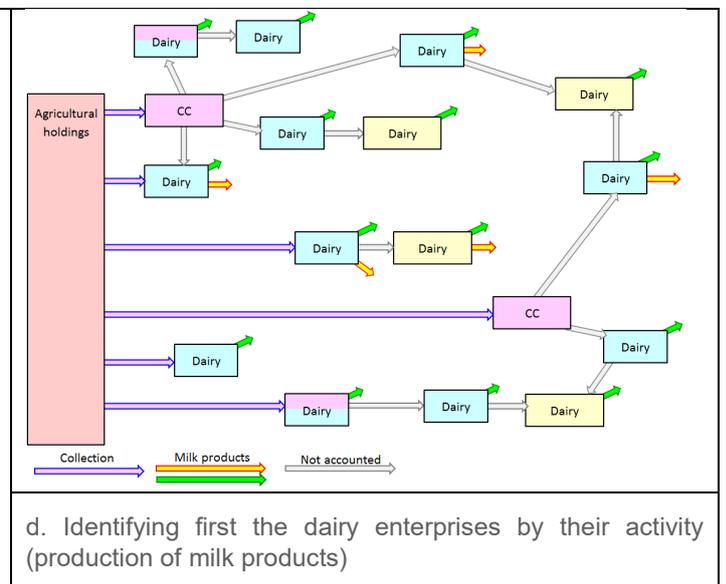
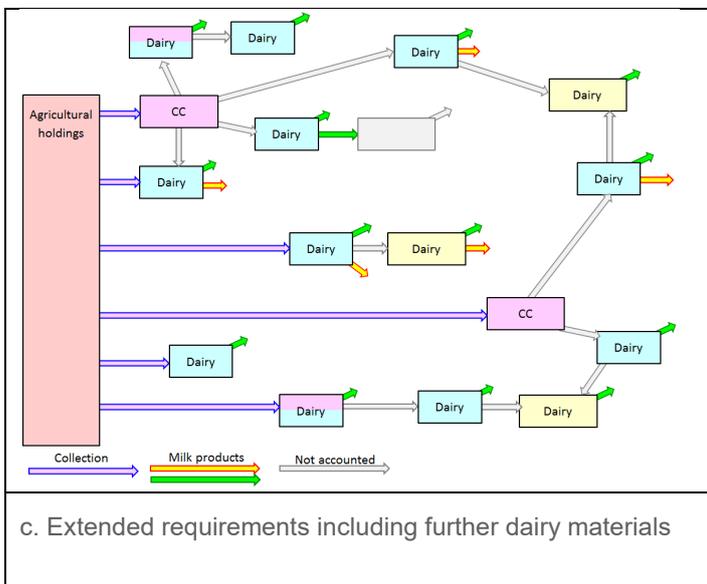
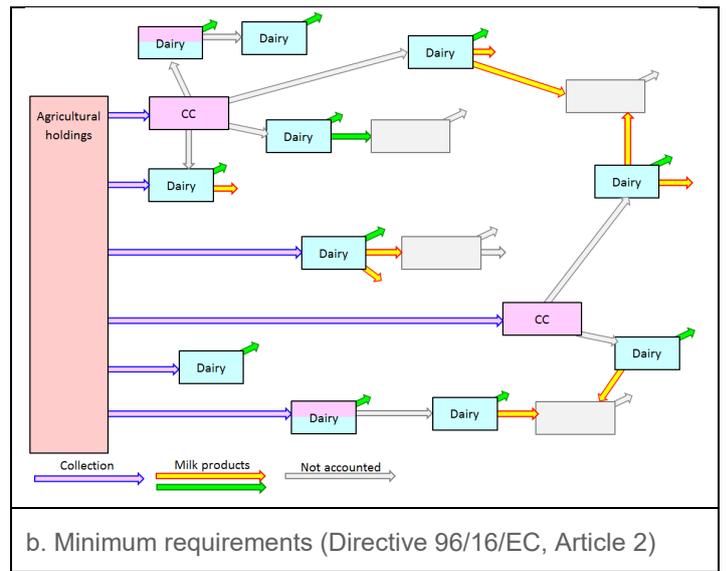
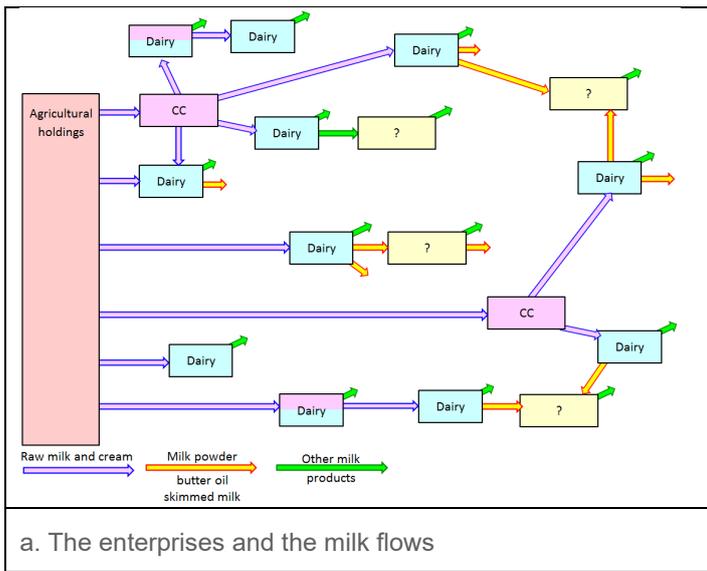


Table 4 describes the practices by the various countries:

Table 4. Definitions implemented for dairy materials and dairy enterprises

Country	Definition	Explanations
BE	Dairy enterprises: Any activity of raw milk collection, production of milk products, use of dairy products in bulk Dairy materials: Every dairy product in bulk	
BG	Input of intermediate products: Milk and cream powder Concentrated milk Yogurt culture Buttermilk and whey	Not directly defined
CZ	Collection covering milk from dairy enterprises	
DK		
DE	Dairy enterprises: Enterprises that collect raw milk and/or produce dairy products. Dairy materials: raw milk and products mentioned in the "Marktordnungswaren-Meldeverordnung"	
EE	None	
IE	Undefined (open) list	Reporting only production for other entities than "dairies and creameries" but every input
EL		
ES	Raw milk only – Detailed mapping of raw milk flows	
FR	In bulk: Liquid, concentrated and powdered milks, cream, buttermilk liquid or concentrated, whey	Breakdown of delivery to dairy sector or to other
HR	Not able to provide information	
IT	Any dairy material: quantity, fat and protein content	
CY		
LV		
LT	Dairy materials: Every dairy product in bulk	
LU		
HU		
MT		
NL		
AT		
PL	Open "Please specify..."	
PT	Milk powders	Collecting and/or processing dairy products
RO		
SI		
SK		
FI		
SE		
UK	Skimmed milk	

Drawn from the monthly questionnaires transmitted by the Member States

3 Identification of statistical units

The economic activities to be inventoried for the purpose of classification of the statistical units are (1) milking dairy animals, (2) purchasing or collecting otherwise farm raw materials and (3) processing raw milk materials.

No reference to national origin of milk is provided, i.e. undertakings purchasing milk from a foreign collection centre are also considered as dairy enterprises.

Table C represents all the holdings with activity 1, whatever can be their other activities. Those which milk is drawn from cows are displayed at regional level (NUTS 2) in Table I.

The dairy enterprises can be classified regarding activities (2) and (3), as displayed on Table 1. Such a classification defines the scope of the various statistical frames for the surveys and other data collection.

Table 5: Classification of dairy enterprises on their activities

Processing raw materials?	Purchasing or collecting otherwise raw milk or cream?	
	Yes	
	No	
Yes	Collecting cows' milk?	
	Yes	No
No	Dairy enterprise collecting milk (processing also)	Dairy enterprise (processing only)
	Collection centre	Not a dairy enterprise

Table 6: Frame of the statistics on milk and milk products by Table

Processing raw materials?	Purchasing or collecting otherwise raw milk or cream?	
	Yes	
	No	
Yes	Collecting cows' milk?	
	Yes	No
No	Dairy enterprise collecting milk (processing also)	Dairy enterprise (processing only)
	Collection centre	Not a dairy enterprise

Table B and H

Processing raw materials?
Yes
No

Purchasing or collecting otherwise farm raw materials?	
Yes	No
Collecting cows' milk?	
Yes	No
Dairy enterprise processing	
Collection centres	

Tables D and E

Processing raw materials?
Yes
No

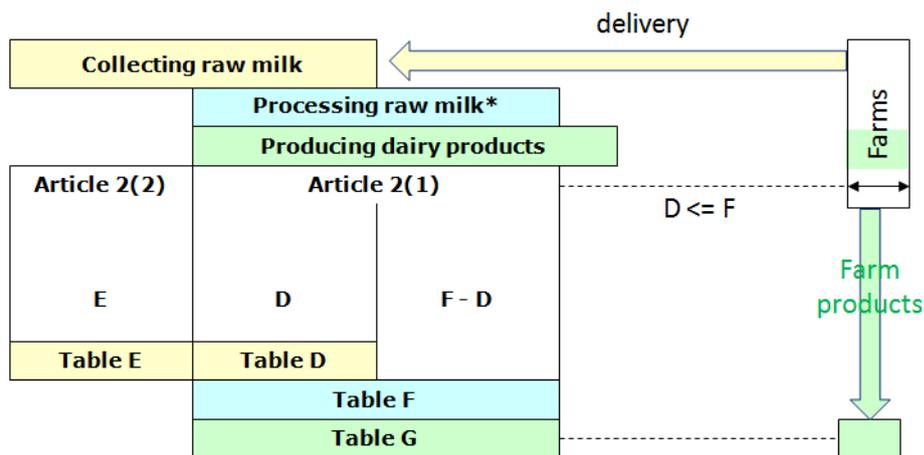
Purchasing or collecting otherwise raw milk or cream?	
Yes	No
Collecting cows' milk?	
Yes	No
Table D: Article 2(1)	
Table E: Article 2(2)	

Tables F and G

Processing raw materials?
Yes
No

Purchasing or collecting otherwise raw milk or cream?	
Yes	No
Collecting cows' milk?	
Yes	No
Table F and G: Dairy enterprise processing (G by group of milk products)	

Figure 6: Dairy enterprises and related activities



*Raw milk: Raw milk and other raw materials

Few **definitions** can be proposed to support the above description.

Milking dairy animals: collecting milk directly from dairy cows, dairy ewes, dairy goats or dairy buffaloes. The owner of the raw milk obtained is considered as conducting this operation, without consideration on whether he is or not owner of the animals. Drawing milk for care purpose (drying up, mastitis care) without collecting it is excluded. Milk suckling of the dairy animals directly by calves, lambs, she-goats or other animals is not considered.

Purchasing raw milk materials: buying raw milk materials. Whether physical collection of raw milk is run by the purchaser, the provider or an independent body not becoming owner of the milk and whether one or the other pays the transport and storing fees is not relevant for defining the purchaser. Whether the raw material provider is in the same country is not considered for identifying the units.

Collecting cow's milk: purchasing raw cow's milk from dairy agricultural holdings.

Processing material: changing the nature of this material by physical and/or chemical/biochemical treatment. Natural separation of cream from milk is excluded from this activity. Packing bulk raw material in small containers is included, although the nature of the material does not change, because this changes its usability by the consumer.

Annex VII – Used milk accountability

1. Description

Used milk is the quantity of milk, whole (noted UWM) or skimmed (noted USM), used in the processes. It makes comparable use of milk for dairy production and availabilities, and for production of various products with different content. It enables to compare input and output in the dairy enterprises and to assess their balance. The used whole milk always refers to positive quantities while the used skimmed milk can also refer to negative quantities, when a process generates skimmed milk.

- The used milk can be considered as real input, of milk only or of a wider range of products. In this case, the used whole milk can be non-corrected raw milk, with seasonal changes in content, or standardised raw milk. The used skimmed milk can have a small but positive fat content and can also include buttermilk, but not whey.
- The used milk can also be considered as a virtual material. In that case, the whole milk is supposed having a constant composition, i.e. the average composition of the milk along the year and through the country. Skimmed milk has then the same components as whole milk, but 0% fat matter.

2. Examples of calculation

In the examples, the tonne is used but in the statistical tables to be filled in at EU level, the unit is *thousand tonnes*.

The first example illustrates how to establish the quantities of used whole and skimmed milk required for processing a product which content is 32 tonnes of cows' milk proteins and 20 tonnes of milk fat, based on standard whole milk at 3.2% protein and at 4.0% fat. The 20 tonnes of milk fat require 500 tonnes of whole milk at 4.0% fat. This whole milk provides also 16 tonnes of protein. The skimmed milk protein content is $3.2/(100-4.0)=3.33\%$. In order to provide the other 28 tonnes of milk protein, 841 tonnes ($28 \text{ t}/3.33\%$) of skimmed milk are required. Whatever is the final quantity of product, the milk fat and protein contents define the milk input, the losses could also be integrated.

If a product is fatter than the reference milk, e.g. butter or cream, USM is negative, i.e. the process generates skimmed milk as a by-product. For instance for producing 1 tonne of butter at 82% fat, 20 tonnes whole milk at 4.1% fat (for making simple the calculation) are required and will thus generate 19 tonnes of 'skimmed milk' (buttermilk) which can be re-used in another process. If 19 tonnes of buttermilk are used for making buttermilk powder (no other input), the USM for buttermilk powder is 19 tonnes. Overall, producing butter and buttermilk powder used $\text{UWM} = 20 \text{ t}$ and $\text{USM} = -19 \text{ t} + 19 \text{ t} = 0 \text{ t}$.

3. Examples of use for analysis

USM and UWM enable comparing quantities of products which would otherwise not be comparable.

The used milk enables comparing quantities of products with different moisture/water content. If milk powder represented apparently one third of the production (in tonnes) of a dairy and drinking milk two thirds, drinking milk would use one fifth of the milk used and milk powder would use four fifth. This is closer from the economic interest of the products.

Further to this, it enables drawing a complete view of milk uses for the various products. In Table 7, the use of the most valuable components of milk, i.e. fat and protein, appears more clearly than with the only volume of products. Drinking milk represents rather one fifth than half of production and butter or cheese use about one third of UWM for each compared to resp. 4% and 15% of the total product weight.

Table 7: USM and UWM for all milk products

Quantities in weight	Product	USM	UWM
Skimmed-milk-generating processes			
Butter and yellow products	1.5	-27.7	29.5
Cream	1.8	-11.0	12.9
Other fresh products	1.6	-0.0	1.4
Sub-total	4.9	-38.7	43.8



Skimmed-milk-consuming processes			
Cheese (and whey)	6.2	10.3	36.2
Acidified milk	5.4	1.4	4.0
Concentrated milk	0.8	0.6	1.3
Drinking milk	21.2	10.0	11.0
Milk-based drinks	1.1	0.6	0.3
Powders	1.7	12.5	3.3
Buttermilk	0.4	0.4	0.0
Caseins	0.1	3.0	0.0
Sub-total	36.9	38.7	56.2
Total	41.7	0.0	100.0

Drawn from EU-28 figures, 2014, Total UWM=100

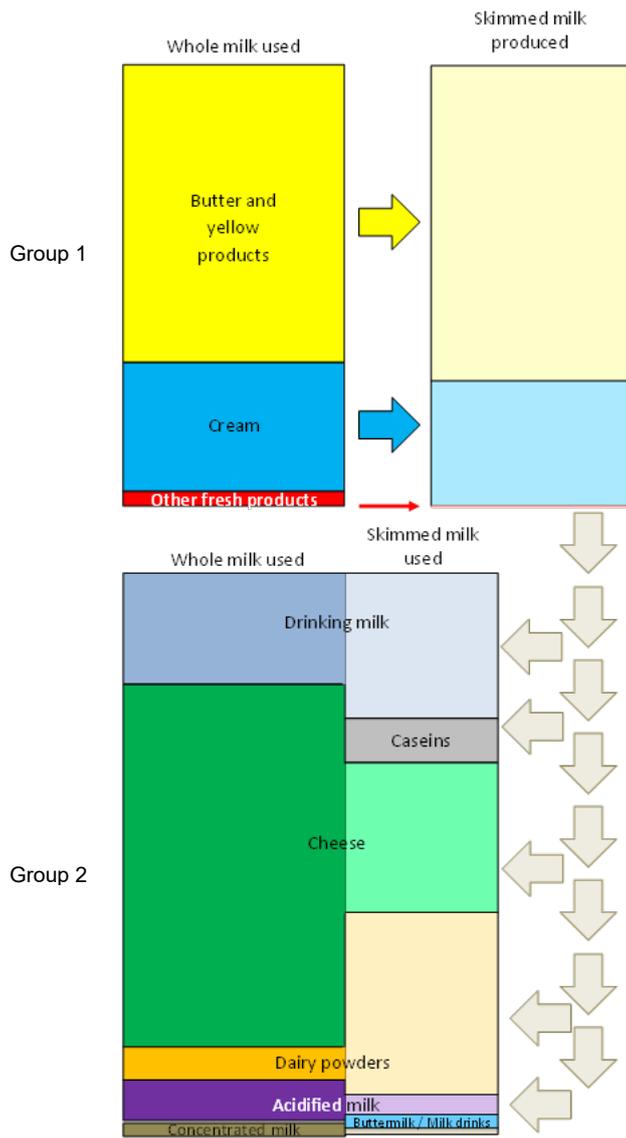
The quantities of various products can be expressed as percentage of several of them.

- Percentage of **used milk** (USM + UWM) enables providing a simple general picture, correcting the dry content of each product; dealing with only positive values avoids providing technical explanations;
- Percentage of **whole milk used** (UWM) enables combining this effect together with valuation of fat matter; it reflects finally how milk fat is used;
- Percentage of skimmed milk requires referring to two separate sets of processes, those generating and consuming skimmed milk; it is sensitive to the level of aggregation (for instance, fat cheeses accounted separately would generate skimmed milk) and therefore should use a conventional classification of the products; complexity of analysis makes it less suitable for wide public audience; combined with UWM, it enables to distinguish orientation within two (or more) relevant groups of products reflecting the driving markets of butter and skimmed milk powder.

The USM and UWM are not reported for whey in Table B. Therefore the USM and UWM reported for cheese also include the whey produced. As well USM and UWM for processed cheese are not reported separately and it is supposed to be produced from dairy products, especially cheese, which use of milk is reported under the relevant headings.

Figure 7 displays the content of Table 7 in a graphical way, showing the transfer of material (skimmed milk) from the skimmed-milk-generating processes to the skimmed milk-consuming processes. The hierarchy in the product list impacts of course the results and for instance, milk powders altogether appear as a skimmed milk-consuming process while production of skimmed milk powder and of cream powder would be classified in a different way. Also the total volume of skimmed milk transferred would be more important with a more detailed nomenclature.

Figure 7: graphical display of USM and UWM

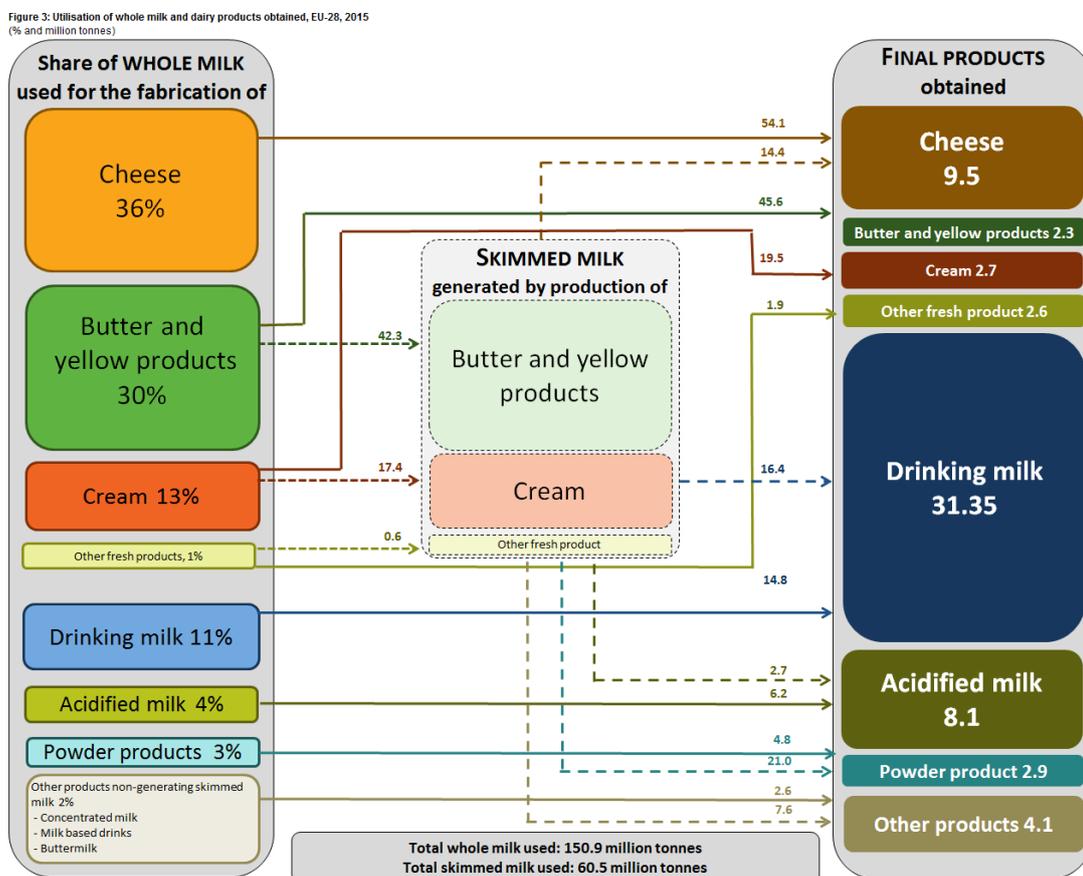


On this chart, the areas are proportional to the quantities displayed in Table 7. The transfer of skimmed milk displayed as a removal from the first group of processes (generating skimmed milk) to the second group (consuming it).

Drawn from EU-28 figures, 2014, Total UWM=100

On Figure 8 (based on 2015 data), the same approach was kept and accurate proportionality of areas was sacrificed for nicer looking. In counterpart the accurate figures are provided. The number of arrows limits a bit readability but more information is provided. The non-involved products (especially whey) could find a background location on the right for completeness.

Figure 8: Flowchart on USM and UWM



4

4. Examples of use for checking consistency

As reported, in a balance sheet, the sum of USM should be close to the net availability of skimmed milk, most often close to zero. The total UWM must similarly be close to the net availability of whole milk, mostly drawn from raw milk collected.

As USW and UWM reflect the fat and protein content of milk, the coefficients for converting a given product of stable content when referring to raw milk of stable content as well are also stable. But most of the products which USM and UWM are provided for are heterogeneous. For instance the drinking milk is an aggregate of more or less skimmed milks and the overall resulting coefficient is a linear combination (e.g. $A_1x_1 + A_2x_2 + \dots + A_nx_n$) of coefficients specific for each category. Therefore such an exercise requires a more detailed list of products.

Consistency of Table B, or of the set of tables on statistics of milk and milk products, is nevertheless to be considered at a wider scale (see 2.4.3, page 27).

5 Limits and difficulties

5.1 An accountancy unit

The first difficulty is that there is a direct mathematical relationship between (1) the quantity of product, (2) its fat and protein content and (3) its USM and UWM. USM and UWM are presented above as virtual measurements, not to be requested from the respondents, but another option may be chosen, as surveying USM and UWM and estimating the fat and protein content. This looks odd because the respondents are used to the concept of fat and protein content, not to the concept of USM and UWM. An analogy would be surveying the number of LSUs for the livestock categories instead of the number of heads. This is rather an academic exercise. So let's continue supposing that the Member states survey the fat and protein content and estimate the USM and UWM.

Eurostat favours that USM and UWM are not to be systematically surveyed from the dairy enterprises, particularly for two reasons:

- Redundancy with the fat and protein content
- Meaningless measurement not usual in the dairy production sector.

Therefore the recommendation is surveying either the quantities of fat and protein or the quantities of material input.

The main headings in the list of products follow the usual classification of the dairy products. The quantities of USM, UWM, fat and protein for the sub-headings are not collected by Eurostat. Nevertheless, in the Member States where this information (or a part of it) is available, it may be relevant sorting the products in a more detailed way and considering the processes generating skimmed milk for the various milk powders, cheeses, concentrated milks, etc.

5.2 Milk from other species

Fat and protein content of other milks (than cows' milk) are significantly different regarding availabilities. Regarding uses of milk, the main product using other milks (pure or mixed) is especially cheese. Less important quantities are nevertheless to be reported for some other products. The most suitable option consists splitting table B in two tables,

- one concerning only cows' milk, for the whole table B and table H, including the products of mixed milks for their cows' milk component,
- one simplified table covering availabilities and main uses (cheese by milk species, other products) for the other milks.

In Table 8 extra-information required is displayed in orange and either blue or green, depending on the chosen method. The list of relevant products can be adapted depending on their actual production.

Table 8: Extra-information needed on milk from other species than cows

A. AVAILABILITIES		Quantities (1000 t)	Milk fat content (t)	Milk protein (t)	
		1	2	3	
1. Ewe's milk collected					
2. Goats' milk collected					
3. Buffalo milk collected					

Code	B. UTILIZATION	Quantities (1000 t)	Milk fat content (t)	Input of:		Milk protein (t)
				Whole milk (1000 t)	Skimmed milk (1000 t)	
		1	2	3	4	
Ewes' milk						
1	Fresh products					
11	Drinking milk					
13	Cream					
2	Manufactured products					
23	Butter and other yellow fat products					
24	Cheese					
241	Cheese by milk category:					
2412	Cheese from ewes' milk (pure)					
	Ewes' milk used in mixed cheese					
27	Whey (in liquid whey equivalent)					
Goats' milk						
1	Fresh products					
11	Drinking milk					
13	Cream					
14	Acidified milk					
2	Manufactured products					
24	Cheese					
241	Cheese by milk category:					
2413	Cheese from goats' milk (pure)					
	Goats' milk used in mixed cheese					
27	Whey (in liquid whey equivalent)					
Buffaloes' milk						
1	Fresh products					
11	Drinking milk					
13	Cream					
2	Manufactured products					
24	Cheese					
241	Cheese by milk category:					
	Cheese from buffaloes' milk (pure)					
	Buffaloes' milk used in mixed cheese					
27	Whey (in liquid whey equivalent)					

The requirements of Directive 96/16/EC and of Decision 97/80/EC do not cover such a method and it is proposed as a good practice for establishing Table B with a limited extra-burden but an efficient and accurate outcome.

For those who do not implement such a detailed calculation, the average fat and protein content of availabilities is used for every product and most of them do not use other milks, at least not in proportion of the availabilities.

The system of USM and UWM makes more complex the work and increases the burden on the Member States in the case of other milks than cows' milk. But the fat and protein content of other milks ground complexity in this case, and USM and UWM only reflect this. Out of USM and UWM, additional protein quantities would be required for establishing a balance sheet.

The USM and UWM look thus really complex to the newcomer. After having integrated it, it is redundant with the fat and protein content of milk, but provides a more catchable unit for the experimented user. It is not necessarily intended to be collected from the dairy enterprises, but its calculation enables to better display interdependency between the processes for the various products.

For a more accurate analysis, displaying those categories of products by distinguishing the fat and slim products is even more appropriate, even if they are not required by the EU legislation. These are especially drinking milk and milk powder, and in a smallest range, cheese and whey or any products having a particular interest.

Annex VIII – Filling in Table B and H

1. Availabilities

For availabilities, the following example covers the most complex situation, i.e. with milk from the four species. Where milks from other animals than cows are not significant, all the calculation can be done in cows' milk equivalent, for simplification.

Amongst the detailed calculation, the right part of Figure 9 shows the two ways to treat milk from ewes, goats and buffaloes, either separately or as cows' milk equivalent. Total availabilities in milk equivalent must be calculated, in a way or another in order to establish the final balance.

Figure 9: Reporting on availabilities (illustration)

Availabilities		Products			From cows' milk		Coefficients		Available milk			Cows' milk equiv.	
Accountancy for each species		Quantities	Fat content	Protein content	Quantities	Protein content	Fat content	Protein content	Whole milk	Skimmed milk	Species	Whole milk	Skimmed milk
Code	Milk and milk products	PRO	FAT	PAT	PRO	PAT	FC	PC	1000t	1000t	SP	AWM	ASM
		1000t	t	t	1000t	t	%	%			code ⁽¹⁾	1000t	1000t
D1100DU	A. Availabilities	13048.26	579323.8	470741.96	8849.26	292073.96			13021.07	20.73		14483.095	-442.68
D1110D	I. Raw cows' milk delivered to dairies	8653	346120	285549	8653	285549	4.0%	3.3%	8653	0	C	8653	0
D1120D	II.1. Ewes' milk delivered to dairies	1867	126956	100818	0	0	6.8%	5.4%	1867	0	E	3173.9	-241.01
D1130D	II.2. Goats' milk delivered to dairies	1935	67725	59985	0	0	3.5%	3.1%	1935	0	G	1693.125	51.89
D1140D	II.3. Buffalos' milk delivered to dairies	397	31760	17865	0	0	8.0%	4.5%	397	0	B	794	-274.29
D1200D	II.4. Raw cream delivered to dairies	1.68	504	40.32	1.68	40.32	30.0%	2.4%	12.6	-11.43	C	12.6	-11.43
D2140_4200D	II.5. Skimmed milk and buttermilk delivered to dairies	14.6	112.4	500.8	14.6	500.8			2.81	11.76	C	2.81	11.76
	Skimmed milk	9.5	28.5	332.5			0.3%	3.5%	0.7125	8.96	C	0.7125	8.96
	Semi-skimmed milk	3.8	72.2	125.4			1.9%	3.3%	1.805	1.84	C	1.805	1.84
	Buttermilk	1.3	11.7	42.9			0.9%	3.3%	0.2925	0.96	C	0.2925	0.96
D9900A	II.6. Other milk products (than milk, cream, skimmed milk)	22.8	2576.4	786.6	22.8	786.6			64.41	-41.53	C	64.41	-41.53
D2120I	III.1. Imports of whole milk (including raw milk)	64.9	2330.5	1988.4	64.9	1988.4			58.2625	-0.42	C	58.2625	-0.42
	Extra-EU imports	2	70	66			3.5%	3.3%	1.75	0.17	C	1.75	0.17
D2120J	III.11. Imports (intra-EU) of whole milk (including raw milk)	62.9	2260.5	1922.4					56.5125	-0.59	C	56.5125	-0.59
	Standardised at 3.5%	51.1	1788.5	1533			3.5%	3.0%	44.7125	-0.12	C	44.7125	-0.12
	At 4.0%	11.8	472	389.4			4.0%	3.3%	11.8	-0.47	C	11.8	-0.47
D2140I	III.2. Imports of skimmed milk	89.9	269.7	3140	89.9	3140			6.7425	84.6	C	6.7425	84.6
	Extra-EU imports	0							0	0	C	0	0
D2140J	III.21. Imports (intra-EU) of skimmed milk	89.9	269.7	3140					6.7425	84.6	C	6.7425	84.6
	Skimmed milk	88.6	265.8	3101			0.3%	3.5%	6.645	83.57	C	6.645	83.57
	Buttermilk	1.3	3.9	39			0.3%	3.0%	0.0975	1.04	C	0.0975	1.04
D2200IME	III.3. Imports of cream	2.31	960	46.54	2.31	46.54			24	-22.65	C	24	-22.65
	Extra-EU imports	0											
D2200JME	III.31. Imports (intra-EU) of cream	2.31	960	46.54					24	-22.65	C	24	-22.65
	Raw cream	0.53	159	12.72			30.0%	2.4%	3.975	-3.6	C	3.975	-3.6
	Standardised at 3.5%	1.78	801	33.82			45.0%	1.9%	20.025	-19.04	C	20.025	-19.04
D9000I	III.4. Imports of other products	0.07	9.8	22.3	0.07	22.3			0.245	0.4	C	0.245	0.4
	Extra-EU imports	0											
D9000J	III.41. Imports (intra-EU) of other products	0.07	9.8	22.3					0.245	0.4	C	0.245	0.4
	Skimmed milk	0.05	4.6	17			9.2%	34.0%	0.115	0.38	C	0.115	0.38
	Buttermilk	0.02	5.2	5.3			26.0%	26.5%	0.13	0.02	C	0.13	0.02
	Reference cows' milk (whole milk)						4.0%	3.3%					
	Reference cows' milk (skimmed milk)							3.4%					

Step 1	Primary information Quantity of products + content of collected materials (data from dairies) Coefficients for average content of milk products imported (in %)
Step 2	Calculate fat and protein content (t) based on standard coefficients FAT=1000 x PRO x FC PAT=1000 x PRO x PC
Step 3	Aggregate at level 3 (intra-EU imports)
Step 4	Aggregate at level 2 Total import = intra-EU + extra-EU imports
Step 5	Calculate cow's milk contribution
Step 6	Calculate the total availabilities D1100DU = D1110D + D1120D + D1130D + D1140D + D1200D + D2140_4200D + D9900A + D2120I + D2140I + D2200IME + D9000I
Step 7	Calculate average fat and protein content (check) and reference cows' milk content (reference) FC = 0.001 x FAT / PRO PC = 0.001 x PAT / PRO

2. Reporting on utilisations: drinking milk

Reporting on production of drinking milk is the easiest example to illustrate reporting in Table B and H. Indeed correspondence between the product and the raw material is almost direct and 1 tonnes of whole drinking milk is almost equivalent to 1 tonne of raw cows' milk used. Two examples are provided, depending on the primary information compiled from the questionnaires to dairy enterprises, further to the quantities of products. The first example (Figure 10: reporting on drinking milk from fat and protein rate) illustrates where the fat and protein rate of the drinking milk is available and the second example (Figure 11) where the milk input is available.

Figure 10: reporting on drinking milk from fat and protein rate

Drinking milk		Products					Used milk	
Starting from quantities of products and of fat and protein content (%)		Quantities	Fat content	Protein content	Fat content	Protein content	Whole milk	Skimmed milk
Code	Label	PRO	FC	PC	FAT	PAT	UWM	USM
		1000t	% weight	% weight	t	t	1000 t	1000 t
D2100	Drinking milk	1071.4			22842.75	36033.01	571.0688	500.007
D2110	Raw drinking milk	0.6	4.0%	3.3%	24	19.8	0.6	0
D2120	Whole milk	324.8	3.5%	3.3%	11368	10772.26	284.2	40.5429
D2121	Whole milk pasteurised	167.6						
D2122	Whole milk sterilised	9.2						
D2123	Whole milk uperised	148						
D2130	Partly skimmed milk	642.5	1.75%	3.4%	11243.75	21690.54	281.0938	361.147
D2131	Partly skimmed milk pasteurised	297.3						
D2132	Partly skimmed milk sterilised	27.5						
D2133	Partly skimmed milk uperised	317.7						
D2140	Skimmed milk	103.5	0.2%	3.4%	207	3550.416	5.175	98.3168
D2141	Skimmed milk pasteurised	54.5						
D2142	Skimmed milk sterilised	5.1						
D2143	Skimmed milk uperised	43.9						
Ref	UWM		4.0%	3.3%				
	USM		0%	3.44%				
	Check (Step 8)				22842.75	36033.01		

Step 0	Primary data
Step 1	Sub-totals by category at level 3 D2120=D2121+D2122+D2123 D2130=D2131+D2132+D2133 D2140=D2141+D2142+D2143
Step 2	Protein content (%) by category at level 3 $PC(i)=PC(ref) / (100\% + FC(i) - FC(ref))$
Step 3	Fat and protein content (tonnes) by category at level 3 FAT = 1000 x PRO x FC PAT = 1000 x PRO x PC
Step 4	Used whole milk (UWM) $UWM=(FAT/FC(ref))/1000 = 0.001 \times FAT/FC(ref)$
Step 5	Used milk (UM) and used skimmed milk (USM) $PAT = 1000 \times (USM \times PC(USM) + UWM \times PC(UWM))$ $PAT/1000 = USM \times PC(USM) + UWM \times PC(UWM)$ $USM = [PAT/1000 - UWM \times PC(UWM)] / PC(USM)$
Step 6	Sub-totals at level 2 D2100 = D2110+D2120+D2130+D2140
Step 7	Check FAT and PAT FAT = 1000 x UWM x FC(UWM) PAT = [1000 x UWM x PC(UWM)] + [1000 x USM x PC(USM)]

Figure 11: reporting on drinking milk from milk input

Drinking milk		Products				Used milk		
Starting from quantities of products and of used milk		Quantities	WM coefficient	SM coefficient	Fat content	Protein content	Whole milk	Skimmed milk
Code	Label	PRO			FAT	PAT	UWM	USM
		1000t			t	t	1000 t	1000 t
D2100	Drinking milk	1071.4			23848	36001.4	571.2	500
D2110	Raw drinking milk	0.6					0.6	0
D2120	Whole milk	324.8					284.3	40.5
D2121	Whole milk pasteurised	167.6					146.7	20.9
D2122	Whole milk sterilised	9.2					8.1	1.1
D2123	Whole milk uperised	148					129.5	18.5
D2130	Partly skimmed milk	642.5					281.1	361.2
D2131	Partly skimmed milk pasteurised	297.3					130.1	167.1
D2132	Partly skimmed milk sterilised	27.5					12	15.5
D2133	Partly skimmed milk uperised	317.7					139	178.6
D2140	Skimmed milk	103.5					5.2	98.3
D2141	Skimmed milk pasteurised	54.5					2.7	51.8
D2142	Skimmed milk sterilised	5.1					0.3	4.8
D2143	Skimmed milk uperised	43.9					2.2	41.7
Ref	UWM		4.0%	3.3%				
	USM		0.2%	3.43%				

Step 0	Primary data
Step 1	Sub-totals by category at level 3
	D2120=D2121+D2122+D2123
	D2130=D2131+D2132+D2133
	D2140=D2141+D2142+D2143
Step 2	Sub-total at level 2
	D2100 = D2110+D2120+D2130+D2140
Step 3	Fat and protein content (tonnes) at level 3
	FAT = 1000 FC(UWM) x UWM + 1000 x FC(USM) x USM
	PAT = 1000 PC(UWM) x UWM + 1000 x PC(USM) x USM

In the case of the calculation based on milk input, the milk input is supposed known in details, but using conversion coefficients enables similarly to estimate the milk input contribution by drinking milk category when the total input is known. The total input for drinking milk can be obtained similarly from the total milk input of the dairy enterprises.

For most of the other dairy products, the calculation is similar, or intermediate with more complex calculation also illustrated in this handbook.

3. Reporting on utilisations: butter and other yellow fat products

Reporting on butter (Figure 12) is particular because (1) the fat content is really high, making sensitive any error on the fat content, (2) the total for the category is expressed in butter equivalent and (3) the process generates skimmed milk equivalent (as buttermilk), recorded as a negative input of skimmed milk.

Figure 12: Reporting on butter and other yellow fat products

Butter and yellow products		Coefficients		Products			Used milk	
Example starting from quantities of products, of milk fat and of milk proteins		Fat content	Protein content	Quantities	Fat content	Protein content	Whole milk	Skimmed milk
		FC	PC	PRO	FAT	PAT	UWM	USM
Code	Milk and dairy products	%	%	1000t	t	t	1000 t	1000 t
	Reference cows' milk (whole milk)	4.0%	3.3%					
	Reference cows' milk (skimmed milk)		3.4%					
D6000	23. Butter, incl. dehydrated butter and ghee, and other fats and oils derived from milk; dairy spreads	82.0%		114.8	94113.5	1199.5	2352.9	-2224
D6100	231. Butter	82.0%	0.8%	94.6	77553.5	777.7	1938.9	-1838.8
D6110	2311. Traditional butter	82.0%	0.8%	93.9	76998	771	1925	-1825.6
D6120	2312. Recombined butter	84.5%	0.8%	0.1	84.5	0.8	2.1	-2
D6130	2313. Whey butter	78.5%	1.0%	0.6	471	5.9	11.8	-11.2
D6200	232. Rendered butter and butteroil	99.6%	0.0%	10.3	10260	1.8	256.5	-246.2
D6900	233. Other yellow fat dairy products	40.6%	2.7%	15.5	6300	420	157.5	-139
D6910	2331. Reduced-fat butter	37.0%	2.9%	4.2	1554	121	38.85	-33.8
D6990	2332. Other yellow fat dairy products	42.0%	2.6%	11.3	4746	299	118.65	-105.2

Step 1	Data collected from dairies Quantity of products + fat content + protein content
Step 2	Check plausibility of fat content % (FC) and protein content % (PC) $FC = 0.001 * FAT(t) / PRO(1000t)$ $PC = 0.001 * PAT(t) / PRO(1000t)$ Insert FC and PC for rereference milks (whole and skimmed)
Step 2	Calculate UWM $UWM = 0.001 * FAT / FC$
Step 3	Used milk (UM) and used skimmed milk (USM) $PAT = 1000 * (USM * PC(USM) + UWM * PC(UWM))$ $PAT / 1000 = USM * PC(USM) + UWM * PC(UWM)$ $USM = [PAT / 1000 - UWM * PC(UWM)] / PC(USM)$
Step 4	Aggregate at level 3 $D6100 = D6110 + D6120 + D6130$ $D6900 = D6910 + D6920$
Step 5	Aggregate at level 2 (except quantities of product) $D6000 = D6100 + D6200 + D6900$
Step 6	Fat content of butter equivalent $FC(D6000) = FC(D6100)$
Step 7	Total in butter equivalent $PRO = FAT / FC$
Step 8	Report all the values

4. Reporting on utilisations: cheese

Reporting on cheese is complex as cheese is the main product concerned by milk from other species than cows. Furthermore cheese of mixed milks contributes to make the calculation difficult. Finally, where mixed-milk cheese are produced, sensitivity of the proportions used makes information difficult to obtain from the dairy enterprises.

Another difficulty is the loss of weight of the product due to drying, making any set of coefficient referring to the product weight inapplicable. Diversity in the dairy production methods and the materials processed contributes also to make the estimates difficult.

Last but not least, the processed cheese was originally considered as a by-product of cheese, but the market evolved and the ingredients for making processed cheese include fresh cheese intended to be reprocessed, as well as cream or other dairy products.

On, only the medium hard cheese from cows' milk is detailed in various sub-categories. In practice, diversity in the products leads to develop long lists of cheese, in order to build relevant sets of coefficients. For readability, only few are displayed in the example.

Like for availabilities, some simplifications are possible regarding the milks from the various species.

Finally and where it is relevant, similar parallel accountancy of the milks from various species can be managed. This may be the case for drinking milk or acidified milks.

Figure 13: Reporting on cheese (illustration)

Code	Label	Coefficients		Products			Used milk		From cows' milk		
		Fat content	Protein content	Quantities	Fat content	Protein content	Whole milk	Skimmed milk	Quantities	Prtein content	
		FC	PC	PRO	FAT	PAT	UWM	USM	PRO2	OUT	
		%	%	1000t	t	t	1000 t	1000 t	1000 t	t	
D7100	Cheese			476.4	131377.5	115417.4	2933.44	234.58		345.97	76582.7
D7121	2411. Cheese from cows'milk (pure)			261.1	62870.4	55305.7	1571.77	100			
D7122	2412. Cheese from ewes milk (pure)			45.6							
D7123	2413. Cheese from goats milk (pure)			31.3							
D7129	2414. Others (cheese from buffalos'milk (pure)			138.4							
D7111	2421. Soft cheese	0.213	0.142	85.2	20220	13220.9	452.97	-81.38			
D7112	2422. Medium soft cheese	0.224	0.222	97.8	23948	23486.8	545.94	109.04			
D7113	2423. Medium hard cheese	0.331	0.249	101.7	36983.8	27411.2	843.76	-70.98			
D7114	2424. Hard cheese	0.278	0.269	87.9	27450.1	26090.3	613.37	99.59			
D7115	2425. Extra hard cheese	0.320	0.310	53	20311.2	19262.9	422.29	69.25			
D7116	2426. Fresh cheese	0.043	0.111	50.8	2464.4	5945.3	55.11	109.06			
D7121	2411. Cheese from cows'milk (pure)			261.1	62870.4	55305.7	1571.77	100		261.1	55305.7
	Reference cows'milk content	4.0%	3.3%				PC(USM) ->	3.4%			
	2421. Soft cheese	0.213	0.142	51	10863	7242	271.58	-50.04			
	2422. Medium soft cheese	0.224	0.222	62.7	14044.8	13919.4	351.12	67.85			
	2423. Medium hard cheese	0.331	0.249	64.4	21316.4	16035.6	532.91	-45.1			
	Medium hard (1)	0.342	0.242	44.2							
	Medium hard (2)	0.322	0.258	9.2							
	Medium hard (3)	0.280	0.272	8.2							
	Medium hard (4)	0.331	0.255	2.8							
	2424. Hard cheese	0.278	0.269	46.1	12815.8	12400.9	320.4	53.17			
	2425. Extra hard cheese	0.320	0.310	8.1	2592	2511	64.8	10.84			
	2426. Fresh cheese	0.043	0.111	28.8	1238.4	3196.8	30.96	63.28			
D7122	2412. Cheese from ewes milk (pure)			45.6	21507.4	18243.4	316.28	20.1			
	Reference ewes'milk content	6.8%	5.4%				PC(USM) ->	5.8%			
	2421. Soft cheese	0.362	0.232	7.8	2823.6	1809.6	41.52	-7.46			
	2422. Medium soft cheese	0.381	0.363	8.2	3124.2	2976.6	45.94	8.56			
	2423. Medium hard cheese	0.563	0.407	8.8	4954.4	3581.6	72.86	-6.09			
	2424. Hard cheese	0.473	0.440	10	4730	4400	69.56	11.11			
	2425. Extra hard cheese	0.544	0.507	10.8	5875.2	5475.6	86.4	13.98			
	2426. Fresh cheese	0.073	0.182	0	0	0	0	0			
D7123	2413. Cheese from goats milk (pure)			31.3	7600.1	7207.5	217.15	14.82			
	Reference goats'milk content	3.5%	3.1%				PC(USM) ->	3.2%			
	2421. Soft cheese	0.186	0.133	5.3	985.8	704.9	28.17	-5.24			
	2422. Medium soft cheese	0.196	0.209	5.6	1097.6	1170.4	31.36	6.17			
	2423. Medium hard cheese	0.290	0.234	6	1740	1404	49.71	-4.26			
	2424. Hard cheese	0.243	0.253	6.9	1676.7	1745.7	47.91	8.11			
	2425. Extra hard cheese	0.280	0.291	7.5	2100	2182.5	60	10.04			
	2426. Fresh cheese	0.038	0.104	0	0	0	0	0			
D7129	2414. Others (cheese from buffalos'milk (pure) or mixed cheese)			138.4	39399.6	34660.8	828.24	99.66			
D7124	Cheese from buffaloes' milk (pure)			11.1	4203.6	2745.8	52.55	7.8			
	Reference buffaloes'milk content	8.0%	4.5%				PC(USM) ->	4.9%			
	2421. Soft cheese	0.426	0.194	2.6	1107.6	504.4	13.85	-2.43			
	2422. Medium soft cheese	0.448	0.303	1.8	806.4	545.4	10.08	1.88			
	2423. Medium hard cheese	0.662	0.340	1.5	993	510	12.41	-0.99			
	2424. Hard cheese	0.556	0.367	1.1	611.6	403.7	7.65	1.22			
	2425. Extra hard cheese	0.640	0.423	0.6	384	253.8	4.8	0.77			
	2426. Fresh cheese	0.086	0.151	3.5	301	528.5	3.76	7.35			
	Cheese from mixed milks			127.3	35196	31915	775.69	91.86			
	Proportion of various milk in the mixed milks										
	Cheese from mixed milks (cows' milk content)			66.7%	23464	21277	517.13	61.24	84.87	21277	
	Cheese from mixed milks (ewes' milk content)			16.3%	30408	5213	126.7	15			
	Cheese from mixed milks (goats' milk content)			13.3%	25858	4256	103.43	12.25			
	Cheese from mixed milks (buffaloes' milk content)			3.7%	10807	1170	28.44	3.37			
	Reference mixed milks content	4.5%	3.7%				PC(USM) ->	3.8%			
	2421. Soft cheese	0.24	0.16	18.5	4440	2960	97.85	-16.21			
	2422. Medium soft cheese	0.25	0.25	19.5	4875	4875	107.44	24.58			
	2423. Medium hard cheese	0.38	0.28	21	7980	5880	175.87	-14.54			
	2424. Hard cheese	0.32	0.30	23.8	7616	7140	167.85	25.98			
	2425. Extra hard cheese	0.36	0.34	26	9360	8840	206.29	33.62			
	2426. Fresh cheese	0.05	0.12	18.5	925	2220	20.39	38.43			

Figure 14: Reporting on cheese (steps)

Step 1	Data collected from dairies Quantity of products (including those intended to processed cheese) + average content
Step 2	Aggregate detailed data by heading Only one example is displayed
Step 3	Calculated average content of mixed milks based on the average proportion of each milk Calculate PC of USM for the reference milk $PC(USM) = PC(ref) / (100\% - FC(ref))$
Step 4	Calculate FAT and PAT $FAT = PRO \times FC$ $PAT = PRO \times PC$
Step 5	Calculate UWM $UWM = PRO \times FC$
Step 6	Calculate USM $USM = PAT(USM) / PC(USM)$ $= [PAT - PAT(UWM)] / PC(USM)$ $= [PAT - UWM \times PC(ref)] / PC(USM)$
Step 7	Aggregate mixed milks used by species In proportion of the milk input by species
Step 8	Calculate FAT and PAT for the mixed milks by species $FAT = 1000 \times UWM \times FC(UWM)$ $PAT = 1000 \times [UWM \times PC(UWM) + USM \times PC(USM)]$
Step 9	Aggregate for pure milk cheses The sum of each type of cheese Aggregate Buffaloes' milk chesse and mixed milks cheese
Step 10	Aggregate by type of cheese
Step 11	Aggregate the total for cheese
Step 12	Quantiy and protein content for cheese from cows' milk Pure (D7121) + Milk mixed (share in D7124)
Step 13	Select the cells to be sent to Eurostat

5. Filling in the tables on activity of dairies (Tables B and H)

After having provided the details on reporting for availabilities, for the products in the general case (drinking milk) and in more complex situation (butter and cheese), the purpose is establishing a balance between (1) available raw milk and other dairy materials and (2) how this raw material is used.

For completeness, Figure 15 and Figure 16 display the whole template to be filled in. For giving a better view, Figure 17 displays only the main rows.

Figure 15: filling in Tables B and H (part 1)

Annual availabilities and utilisation of milk by dairies																			
Tables B and H - balance of fat (all milks) and proteins (cows' milk)																			
Units: 1000 tonnes (products and input) and tonnes (content)																			
Dataset: MILK_TABLEB_A																			
Contry: CC																			
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
0	2003-Annual																		
1	DAIRYPROD_BHREV	Quantities (1000 t)			Milk fat content (t)			Whole milk input (1000 t)			Skimmed milk input (1000 t)			Products from cows' milk only (1000 t)			Cows' milk protein (t)		
2	A. Availabilities				579323.8									8849.26			292073.96		
3	I. Raw cows' milk delivered to dairies	8653			346120									8653			285549		
4	II.1. Ewes' milk delivered to dairies	1867			126956														
5	II.2. Goats' milk delivered to dairies	1935			67725														
6	II.3. Buffalos' milk delivered to dairies	397			31760														
7	II.4. Raw cream delivered to dairies	1.68			504														
8	II.5. Skimmed milk and buttermilk delivered to dairies	14.6			112.4														
9	II.6. Other milk products (than milk, cream, sk	22.8																	
10	III.1. Imports of whole milk (including raw milk)	64.9			2330.5														
11	III.1.1. Imports (intra-EU) of whole milk (incl	62.9			2260.5														
12	III.2. Imports of skimmed milk	89.9			269.7														
13	III.2.1. Imports (intra-EU) of skimmed milk	89.9			269.7														
14	III.3. Imports of cream	2.31			960														
15	III.3.1. Imports (intra-EU) of cream	2.31			960														
16	III.4. Imports of other products	0.07																	
17	III.4.1. Imports (intra-EU) of other products	0.07																	
18	B. Utilization																		
19	1. Fresh products				84883		2122.06		-293.69										
20	11. Drinking milk	1071.40			22843		571.07		500.01					1071.40			36033		
21	111. Raw drinking milk	0.60																	
22	112. Whole milk	324.80												324.80			10772		
23	112.1. Whole milk pasteurised	167.60																	
24	112.2. Whole milk sterilised	9.20																	
25	112.3. Whole milk uperised	148.00																	
26	113. Partly skimmed milk	642.50												642.50			21691		
27	113.1. Partly skimmed milk pasteurised	297.30																	
28	113.2. Partly skimmed milk sterilised	27.50																	
29	113.3. Partly skimmed milk uperised	317.70																	
30	114. Skimmed milk	103.50												103.50			3550		
31	114.1. Skimmed milk pasteurised	54.50																	
32	114.2. Skimmed milk sterilised	5.10																	
33	114.3. Skimmed milk uperised	43.90																	
34	12. Buttermilk	28.27			136		3.41		25.50					28.27			989		
35	13. Cream for direct consumption	135.82			44529		1113.22		-973.86					135.82			3260		
36	13.1. Cream of fat content by weight not	50.09																	
37	13.2. Cream of fat content by weight ov	85.73																	
38	14. Acidified milk (yoghurts and other)	405.65			12409		310.23		133.49										
39	14.1. Acidified milk with additives	193.08																	
40	14.2. Acidified milk without additives	212.57																	
41	15. Drinks with a milk base	84.27			1110		27.74		50.90										
42	16. Other fresh products (Milk jelly and oth	127.81			3856		96.39		-29.73										

Figure 16: filling in Tables B and H (part 2)

43	2. Manufactured products		488873	10787.06	298.71			
44	21. Concentrated milk	58.78	3889	97.22	33.27	58.78	4352	
45	211. Concentrated milk not sweetened	46.38						
46	212. Concentrated milk sweetened	12.40						
47	22. Powder products	888.10	214800	5370.00	1950.00			
48	227. Fat milk powder (2211 + 222 + 223)		214800	5370.00	0.00			
49	221. Cream milk powder	0.00				0.00	0	
50	222. Whole milk powder	696.60				696.60	184600	
51	223. Partly skimmed milk powder	0.00				0.00	0	
52	224. Skimmed milk powder	191.50	0	0.00	1950.00	191.50	67030	
53	225. Buttermilk powder	0.00	0	0.00	0.00	0.00	0	
54	226. Other powder products	0.00	0	0.00	0.00			
55	23. Butter, incl. dehydrated butter and ghee	114.80	94114	2352.90	-2224.00	114.80	1200	
56	231. Butter	94.60	77554	1938.90	-1838.80			
57	2311. Traditional butter	93.90	76998	1925.00	-1825.60			
58	2312. Recombined butter	0.10	85	2.10	-2.00			
59	2313. Whey butter	0.60	471	11.80	-11.20			
60	232. Rendered butter and butteroil	10.30	10260	256.50	-246.20			
61	233. Other yellow fat dairy products	15.50	6300	157.50	-139.00			
62	2331. Reduced-fat butter	4.20	1554	38.85	-33.80			
63	2332. Other yellow fat dairy products	11.30	4746	118.65	-105.20			
64	24. Cheese	476.40	131378	2933.44	234.58	345.97	76583	
65	2411. Cheese from cow's milk (pure)	261.10	62870	1571.77	100.00			
66	2412. Cheese from ewes' milk (pure)	45.60						
67	2413. Cheese from goats' milk (pure)	31.30						
68	2414. Others (cheese from buffalo's milk)	138.40						
69	2421. Soft cheese	85.20						
70	2422. Medium soft cheese	97.80						
71	2423. Medium hard cheese	101.70						
72	2424. Hard cheese	87.90						
73	2425. Extra hard cheese	53.00						
74	2426. Fresh cheese	50.80						
75	25. Processed cheese	899.00				899.00	133020	
76	26. Caseins and caseinates	8.06	135	3.37	265.26	8.06	8730	
77	27. Whey	54810.00	43352			53452.00	427610	
78	271. Whey (liquid)	12810.00						
79	272. Whey (concentrated)	0.00						
80	273. Whey (in powder or in block)	504.00						
81	274. Lactose (milk sugar)	12.00						
82	275. Lactalbumin	5.00						
83	28. Other manufactured products	23.48	1205	30.13	39.60			
84	3. Skimmed milk and buttermilk returned by dairies	12.50	21		12.30			
85	4. Milk and cream in bulk: Exports	5.20	272	6.79	-2.20			
86	41. Milk and cream in bulk: Exports intra-EU	4.90	258	6.45	-2.10			
87	5. Milk, other uses by dairies	62.51	4278	106.96	8.10			
88	6. Milk, differences and losses in dairies		996.8	-1.8	-2.49			
89	B. Total utilization		579323.8	13021.07	20.73			

Figure 17: filling in Tables B and H (summary)

Annual availabilities and utilisation of milk by dairies													
Tables B and H - balance of fat (all milks) and proteins (cows' milk)													
Units: 1000 tonnes (products and input) and tonnes (content)													
Dataset: MILK_TABLEB_A						Contry: CC							
	A	B	CD	E	FG	H	IJ	K	LM	N	OP	Q	RS
0	2003-Annual												
1	DAIRYPROD_BHREV	Quantities (1000 t)		Milk fat content (t)		Whole milk input (1000 t)		Skimmed milk input (1000 t)		Products from cows' milk only (1000 t)		Cows' milk protein (t)	
2	A. Availabilities			579323.8						8849.26		292073.96	
3	I. Raw cow s' milk delivered to dairies	8653		346120						8653		285549	
18	B. Utilization												
19	1. Fresh products			84883		2122.06		-293.69					
20	11. Drinking milk	1071.40		22843		571.07		500.01		1071.40		36033	
34	12. Buttermilk	28.27		136		3.41		25.50		28.27		989	
35	13. Cream for direct consumption	135.82		44529		1113.22		-973.86		135.82		3260	
38	14. Acidified milk (yoghurts and other)	405.65		12409		310.23		133.49					
41	15. Drinks with a milk base	84.27		1110		27.74		50.90					
42	16. Other fresh products (Milk jelly and oth	127.81		3856		96.39		-29.73					
43	2. Manufactured products			488873		10787.06		298.71					
44	21. Concentrated milk	58.78		3889		97.22		33.27		58.78		4352	
47	22. Powder products	888.10		214800		5370.00		1950.00					
55	23. Butter, incl. dehydrated butter and ghe	114.80		94114		2352.90		-2224.00		114.80		1200	
64	24. Cheese	476.40		131378		2933.44		234.58		345.97		76583	
75	25. Processed cheese	899.00								899.00		133020	
76	26. Caseins and caseinates	8.06		135		3.37		265.26		8.06		8730	
77	27. Whey	54810.00		43352						53452.00		427610	
83	28. Other manufactured products	23.48		1205		30.13		39.60					
84	3. Skimmed milk and buttermilk returned by da	12.50		21				12.30					
85	4. Milk and cream in bulk: Exports	5.20		272		6.79		-2.20					
87	5. Milk, other uses by dairies	62.51		4278		106.96		8.10					
88	6. Milk, differences and losses in dairies			996.8		-1.8		-2.49					
89	B. Total utilization			579323.8		13021.07		20.73					

Step 1	Report on availabilities
Step 2	Report on drinking milk
Step 3	Similarly, report on buttermilk, cream, acidified milk, drinks with a milk base and other fresh products; on concentrated milk, powders, caseins, other manufactured products including quantities processed into processed chesse
Step 4	Report on butter and other yellow products
Step 5	Report on cheese
Step 6	Report on processed cheese and whey (no milk used) Total whey in liquid whey equivalent
Step 7	Report on other uses Skimmed milk returned to farms, exports, other uses (delivery to agri-food)
Step 8	Calculate Aggregates of level 1 D0110 = D2100 + D4200 + D2200V + D4100 + D9100 + D9200 D0120 = D3200 + D3100 + D6000 + D7100 + D9300 (+ D5000) + D9400
Step 9	Set total utilisations = total availabilities
Step 10	Calculate differences and losses D1100DL = MC900 - D0110 - D0120 - D2140RA - D2000X - D1100OUD

The total of utilisation was drawn from Figure 9. The total of whole milk and skimmed milk is not to be reported in availabilities but, because availabilities and utilisations have the same totals, they must appear in the bottom of part B. Differences and losses are calculated at the really end. In the example a reasonable difference was kept, in order to illustrate that the content of this row can hardly be zero. As explained above, not only errors, but also real phenomena are covered here. The

total for proteins is not displayed because not covered by the legislation, but the Member states are advised doing with protein the same calculation as for fat matter.

When filing in Table B and H, the differences and losses are rarely reasonable in a first trial. They illustrate in such a case where the problems can be (see Annex VII). This leads to corrections to improve the result, up to obtaining coherent and complete results.

Annex IX – Filling in Tables C and I

At farm level, availabilities and utilisation of milk, as resulting of the farm data, can be displayed as in Table 11. This example was designed to be coherent with the example for Tables B and H.

Table 9: Raw results obtained from farms

Milk and milk products	Quantities	UWM (1000 t)	USM
Availabilities			
Whole milk	14339.2	14339.2	
Cows' milk	9801.7		
dairy cows' milk	9527.3		
Ewes' milk	1749.0		
Goats' milk	2391.1		
Buffaloes' milk	397.3		
Income of skimmed milk and buttermilk	12.5		12.5
Availabilities		14339.2	12.5
Utilisations			
Milk	13326.2	13090.2	236.0
Raw milk delivered to dairies	13047.0	13047.0	0.0
Drinking milk non-delivered	279.2	43.2	236.0
Home consumption	3.4	(0.5)	(2.9)
Direct sales	275.8	(42.7)	(233.1)
Cream	2.6	25.1	-22.5
Delivered to dairies	1.7	(16.0)	(-14.3)
Non-delivered	1.0	(9.1)	(-8.1)
Skimmed milk and buttermilk	14.6	0.0	14.6
Delivered to dairies	14.6	(0.0)	(14.6)
Non-delivered	0.0	(0.0)	(0.0)
Feed	0.0	(0.0)	(0.0)
Butter	0.5	9.1	-8.6
Delivered to dairies	0.0	(0.0)	(0.0)
Non-delivered	0.5	(9.1)	(-8.6)
Cheese	157.8	1216.8	-250.0
Delivered to dairies	22.8	136.8	0.0
Non-delivered	135.0	1080.0	0.0
Other milk products	19.3	3.1	31.0
Delivered to dairies	19.3	3.1	31.0
Non-delivered	0.0	0.0	0.0
Utilisations		14335.3	0.5

() The figures between brackets were estimated as simple proportions. For cheese, they have been calculated as the aggregation of results by species' milk.

The cells displayed in green relate to cells in Table B

One can notice that the raw milk delivered to dairies was 13,047 thousand tonnes whereas the milks collected by dairies (Table B) was 12,852 thousand tonnes, i.e. 195,000 tonnes lower. This means that the farms have delivered to foreign dairies 195,000 tonnes over what the dairies have collected from foreign farms. E.g. the farms having delivered 295,000 tonnes to foreign dairies and the dairies have collected 100,000 tonnes from foreign farms.

All the cells displayed in green are similarly connected with figures Table B, of which they deviate from the foreign collection balance.

The above table becomes, when using the Decision display.

Table 10: Legal display of Table C

A. Availabilities (1 000 t)			
	Whole milk		Skimmed milk and buttermilk
1. Cows milk	9801.7	1. Returned by dairies	12.5
1.1. of which dairy cows' milk	9527.3	2. Balance of cream deliveries	14.3
2. Ewes' milk	1749.0	3. Farm butter and cream production	16.7
3. Goats milk	2391.1		
4. Buffalo milk	397.3		
Total	14339.1	Total	43.5
B. Utilisation (1 000 t)			
	Whole milk		Skimmed milk and buttermilk
1. Drinking milk	43.2	1. Drinking milk	236.0
(a) Home consumption	0.5	2. Farm cheese	-8.6
(b) Direct sales	42.7	3. Feed	0.0
2. Farm butter and cream	18.2	4. Delivered to dairies	14.6
3. Farm cheese	1080.0		
4. Other products	0.0		
5. Feed	0.0		
6. Delivered to dairies	13202.9		
(a) Milk	13047.0		
(b) Cream	16.0		
(c) Other products (specify)	139.9		
7. Differences and losses	-5.2		
Total	14339.1	Total	242.0
C. Products obtained (1 000 t)			
1. Drinking milk	279.2		
(a) Home consumption	3.4		
(b) Direct sales	275.8		
2. Farm cream	2.6		
of which delivered to dairies	1.7		
3. Farm butter	0.5		
of which delivered to dairies	0.0		
4. Farm cheese	157.8		
of which delivered to dairies	22.8		
5. Other products (specify)	19.3		
of which delivered to dairies	0.0		

The following steps were followed to fill in [Table 10](#).

- The data from [Table 11](#) have been dispatched in [Table 10](#), while taking care of
 - Heading 3 under Availabilities of skimmed milk and buttermilk is the sum of two items in [Table 11](#);
 - Headings 1 to 5 under Utilisation of whole milk cover only the products not delivered to the dairies;
 - For exemplarity, cheese process generates here skimmed milk, because the cheese is fatter than milk (e.g. processed with cream); normally this value is positive;
 - Heading 6(c) under Utilisation of whole milk includes butter and cheese delivered to the dairies

- The totals are calculated for availabilities, for utilisation of skimmed milk and buttermilk (orange cells). The sub-total for heading 6 under Utilisation of whole milk is calculated (orange cell). The total for Utilisation of whole milk is set at the level of Availabilities of whole milk (yellow cell).
- The differences and losses are calculated under Utilisation of whole milk as the discrepancy between the total (14339.1) and the sum of headings 1 to 6 (14344.3) (red cell).

Figure 18: Filing in Table C

Annual production and utilization of milk (all milks) on farms			
Unit : 1000 t			
Table C			
Dataset: MILK_TABLEC_A			
	A	B	C D
0	DAIRYPROD_CREV	2003-Annual	
1	Availabilities (w hole milk)	14339.10	
2	Cow s' milk (w hole milk)	9801.70	
3	of w hich dairy cow s' milk (w hole milk)	9527.30	
4	Ew es' milk (w hole milk)	1749.00	
5	Goats' milk (w hole milk)	2391.10	
6	Buffalo milk (w hole milk)	397.30	
7	Availabilities (skimmed milk and butter milk)	43.50	
8	Returned by dairies (skimmed milk and butter milk)	12.50	
9	Balance of cream deliveries (skimmed milk and butter milk)	14.30	
10	Farm butter and cream production (skimmed milk and butter milk)	16.70	
11	Utilization (used w hole milk)	14339.10	
12	Drinking milk (used w hole milk)	43.20	
13	Home consumption - drinking milk (used w hole milk)	0.50	
14	Direct sales - drinking milk (used w hole milk)	42.70	
15	Farm butter and cream (used w hole milk)	18.20	
16	Farm cheese (used w hole milk)	1080.00	
17	Other products (used w hole milk)	0.00	
18	Feed (used w hole milk)	0.00	
19	Delivered to dairies (used w hole milk)	13202.90	
20	Milk - delivered to dairies (used w hole milk)	13047.00	
21	Cream (in milk equivalent) - delivered to dairies	16.00	
22	Other products - delivered to dairies (used w hole milk)	139.90	
23	Difference and losses (used w hole milk)	-5.20	
24	Utilization (used skimmed milk and butter milk)	242.00	
25	Drinking milk (used skimmed milk and butter milk)	236.00	
26	Farm cheese (used skimmed milk and butter milk)	-8.60	
27	Feed (used skimmed milk and butter milk)	0.00	
28	Delivered to dairies (used skimmed milk and butter milk)	14.60	
29	Products obtained (quantity)		
30	Drinking milk (quantity)	279.20	
31	Home consumption (quantity) - drinking milk	3.40	
32	Direct sales (quantity) - drinking milk	275.80	
33	Farm cream (quantity)	2.60	
34	of w hich delivered to dairies (quantity)	1.70	
35	Farm butter (quantity)	0.50	
36	of w hich delivered to dairies (quantity)	0.00	
37	Farm cheese (quantity)	157.80	
38	of w hich delivered to dairies (quantity)	22.80	
39	Other products (quantity)	19.30	
40	of w hich delivered to dairies (quantity)	0.00	

Figure 18 illustrates how the data are set in a single column for transmission to Eurostat.

Table I provides the regional data on cows' milk production, i.e. their total for the country is expected to be similar to the value of Heading 1 under Availabilities of whole milk (9801.7 thousand tonnes in the example). Due to stratification and weighting, it can nevertheless be slightly different.

Annex X – Filling in Tables D, E, F and G

1. Tables D and E (milk collected)

In the example for Table B, one can see that the milk collected represents 12,864.6 thousand tonnes of whole, including 12.6 whole milk equivalent collected as raw cream. This collection was conducted by collection centers, not processing raw milk, and other dairy enterprises. In the bellow example, 5 collection centres collected 1.2 million tonnes while the remaining 11,664.6 thousand tonnes were collected by 55 other dairy enterprises.

The distribution of collection by the collection center is directly represented in the transmission for, as there is no major difficulty.

The only comment is that the figures on the volume of milk collected are in thousand tonnes while the size classes are explicitly in tonnes.

Figure 19: Structure of dairy enterprises under article 2(1) by volume of milk collection

Dairy structure - Table D						
Enterprises (1) by volume of annual milk collection						
(1) Referred to in point 1 of the first paragraph of Article 2 of Directive 96/16/EC						
Dataset: MILK_DSEND3_3						
Country: CC						
	A	B	C	D	E	F G
0	2003-Every three years					
1	SIZECL_DC	Number of centres	Collection (1000t)			
2	Total	55			11664.6	
3	5 000 t and under	10			30.6	
4	5 001 to 20 000 t	9			162.9	
5	20 001 to 50 000 t	8			280.2	
6	50 001 to 100 000 t	7			525.3	
7	100 001 to 300 000 t	6			1665	
8	Over 300 000 t	15			9000.6	
9	300 001 to 400 000 t	5			1912.3	
10	400 001 to 500 000 t	4			1897.5	
11	500 001 to 750 000 t	3			2112.1	C
12	750 001 to 1 000 000 t	2			1848.6	C
13	Over 1 000 000 t	1			1230.1	C

In **Figure 19**, the classes of the largest dairy enterprises are confidential because they display the figures for only one or two enterprises. A third class is confidential whereas there is no dominance of the two major contributor. Indeed, the constraint of the size class limits makes unsecure the three individual results as one of them is 612,100 tonnes milk collected. The value for the two other cells is thus $2112.1 - 612.1 = 1500$ thousand tonnes, whereas each value is ≤ 750 thousand tonnes. The first respondent would easily conclude that the two other values are 750,000 tonnes.

Figure 20: Structure of dairy enterprises under article 2(2), i.e. collection centres, by volume of milk collection

Dairy structure - Table E						
Collection centres (1) by volume of annual milk collection						
(1) Referred to in point 2 of the first paragraph of Article 2 of Directive 96/16/EC						
Dataset: MILK_DSENC3_3						
Country: CC						
	A	B	C	D	E	F G
0	2003-Every three years					
1	SIZECL_CC	Number of centres	Collection (1000t)			
2	Total	5	C		1200	C
3	1 000 t and under	0			0	
4	1 001 to 5 000 t	1	C		4.1	C
5	Over 5 000 t	4	C		1195.9	C
6	5 001 to 20 000 t	0			0	
7	20 001 to 50 000 t	2	C		93.8	C
8	50 001 to 100 000 t	0			0	
9	Over 100 000 t	2	C		1102.1	C

In Figure 20, the cells with values zero were set to confidential in order to drop the above effect of constraint. The total is confidential due to dominance of the two largest collection centres.

The sum of milk collected from Table D and Table E is the sum of milk and cream (in milk equivalent) of Table B.

2. Tables F (milk processed)

In a similar way, Table F provide the number of dairy enterprises processing milk by volume of milk treated. The total volume is expected to fit with the volume of used whole milk for milk product processing in Table B, i.e. for fresh or manufactured products, and possibly some or all other uses. The transmission form is displayed on [Figure 21](#).

Figure 21: Structure of dairy enterprises by volume of milk treated

Dairy structure - Table F							
Enterprises (1) by volume of milk treated							
(1) Referred to in point 1 of the first paragraph of Article 2 of Directive 96/16/EC							
Dataset: MILK_DSENDV_3							
Contry: CC							
	A	B	C	D	E	F	G
0	2003-Every three years						
1	SIZECL_DV		Number of enterprises		Volume (1000t)		
2	Total	92			12909		
3	5 000 t and under	20			86		
4	5 001 to 20 000 t	17			268		
5	20 001 to 50 000 t	11			385		
6	50 001 to 100 000 t	13			925		
7	100 001 to 300 000 t	18			3844		
8	Over 300 000 t	13			7400.7		
9	300 001 to 400 000 t	5			1795		
10	400 001 to 500 000 t	3			1345		
11	500 001 to 750 000 t	2	C		1310	C	
12	750 001 to 1 000 000 t	2	C		1809	C	
13	Over 1 000 000 t	1	C		1142	C	

3. Tables G1 to G5 (groups of products)

The Tables G1 to G5 provide the structure of dairy enterprises for five groups of products, i.e. fresh products (G1), drinking milk (G2), powdered dairy products (G3), butter and other yellow fat products (G4) and cheese (G5).

The tables are expected to be coherent, in their level of production, with the corresponding quantities of products reported in Table B.

The classes of production are different depending on the product as, for instance, annual production is hardly comparable between drinking milk and powdered dairy products.

In the transmission form (Figure 22), an additional class is displayed as optional. This class, inherited from the former legislation, enables to (i) bridge the time series and (ii) publish a sub-total of confidential cells (e.g. for Fresh products). Nevertheless this non-mandatory cell should be published while mandatory totals would be flagged as confidential (e.g. powdered dairy products).

Figure 22: Structure of dairy enterprises by production of groups of products

Dairy structure - Tables G1 to G5						
Enterprises (1) by annual production of certain groups of milk products						
(1) Referred to in point 1 of the first paragraph of Article 2 of Directive 96/16/EC						
Dataset: MILK_DSENGM_3						
Contry: CC						
	A	B	C	D	E	F G
0	2003-Every three years					
1	SIZECL_GM	Number of enterprises			Annual production (1000t)	
2	Total: Fresh products	60			1853.2	
3	1000 t or less: Fresh products	21			9.3	
4	From 1 001 to 10 000 t: Fresh products	11			53.2	
5	From 10 001 to 30 000 t: Fresh products	9			182.6	
6	From 30 001 to 50 000 t: Fresh products	9			372.1	
7	From 50 001 to 100 000 t: Fresh products	5			381.5	
8	Over 100 000 t: Fresh products	5			854.5	
9	From 100 001 to 150 000 t: Fresh products	3	C		376.4	C
10	From 150 001 to 200 000 t: Fresh products	0	C		0	C
11	From 200 001 to 250 000 t: Fresh products	2	C		478.1	C
12	Over 250 000 t: Fresh products	0	C		0	C
13	Total: Drinking milk	35			1071.4	
14	1000 t or less: Drinking milk	18			9.5	
15	From 1 001 to 10 000 t: Drinking milk	7			34.6	
16	From 10 001 to 30 000 t: Drinking milk	4			81.7	
17	From 30 001 to 100 000 t: Drinking milk	2			158.2	
18	Over 100 000 t: Drinking milk	4			787.4	
19	From 100 001 to 150 000 t: Drinking milk	2	C		261.3	C
20	From 150 001 to 200 000 t: Drinking milk	1	C		160.9	C
21	From 200 001 to 250 000 t: Drinking milk	0	C		0	C
22	Over 250 000 t: Drinking milk	1	C		365.2	C
23	Total: Powdered dairy products	10			888.1	
24	1000 t or less: Powdered dairy products	0			0	
25	From 1001 to 5000 t: Powdered dairy products	0			0	
26	From 5 001 to 20 000 t: Powdered dairy products	1			17.3	C
27	Over 20 000 t: Powdered dairy products	9			870.8	C
28	From 20 001 to 25 000 t: Powdered dairy products	5			108.5	
29	Over 25 000 t: Powdered dairy products	4	C		762.3	C
30	Total: Butter	40			114.8	
31	100 t or less: Butter	26			1.7	
32	From 101 to 1000 t: Butter	6			3.5	
33	From 1001 to 5000 t: Butter	3			8.8	
34	From 5001 to 10 000 t: Butter	0			0	
35	Over 10 000 t: Butter	5			100.8	
36	From 10 001 to 15 000 t: Butter	2	C		24.2	C
37	From 15 001 to 20 000 t: Butter	1	C		18.5	C
38	From 20 001 to 25 000 t: Butter	1	C		27.6	C
39	Over 25 000 t: Butter	1	C		30.5	C
40	Total: Cheese	70			476.4	
41	100 t or less: Cheese	17			1.3	
42	From 101 to 1000 t: Cheese	12			10.1	
43	From 1001 to 4000 t: Cheese	12			31.5	
44	From 4001 to 10 000 t: Cheese	10			79.8	
45	Over 10 000 t: Cheese	19			353.7	
46	From 10 001 to 15 000 t: Cheese	7			85.2	
47	From 15 001 to 20 000 t: Cheese	5			86.7	
48	From 20 001 to 25 000 t: Cheese	3	C		67.1	C
49	Over 25 000 t: Cheese	4	C		114.7	C

Annex XI – Classification of the milk products

Overview. The standard classification of milk and milk products is based on the list of products provided in annex I of the Decision. It has been extended in order to cover also:

- The raw milk and cream,
- The various aggregates resulting from the tabular format of Annex II of the Decision,
- The distinction, for the same products, between the various scopes under which the product can be observed.

Coding logic. The codes are structured as a string of one character, four digits, and possibly an extension of few characters, like **D9999XXX**, **D0120**, or **D9010A**. The first character represents the chapter of the list of the main classification of milk and milk products, the series of four digits represents a hierarchy in the main nomenclature. Together, this mandatory part of the code, the root, represents the objective product. The optional extension, reflect a further property, usually a domain-specific concept, like the scope or the use of the product.

Chapter. Chapter D covers *Milk, cheese and eggs*. The milk statistics refer only to products of chapter D.

The four digits code the product within the chapter. The root refers, where applicable, to the Combined Nomenclature and the first level is organised as follows:

- **D0000 – Aggregates of items otherwise identified with code D**
- D1000 – Raw milk and cream
- D2000 – Milk and cream, not concentrated nor containing added sugar or other sweetening matter
- D3000 – Milk and cream, concentrated or containing added sugar or other sweetening matter
- D4000 – Buttermilk, curdled milk and cream, yogurt, kephir and other fermented or acidified milk and cream
- D5000 – Whey
- D6000 – Butter, incl. dehydrated butter and ghee, and other fats and oils derived from milk; dairy spreads
- D7000 – Cheese and curd
- *D8000 – Eggs*
- **D9000 – Other milk products**

The extension may be

a character or a string of characters coding a particular concept:

- A – **A**vailable on **a**gricultural holdings
- D – **D**elivered to **d**airies
- R – **R**eturned
- U – Total **U**tilisable
- AB – **A**vailable from **b**utter production
- BC – **B**alance of **c**ream delivery
- OU – **O**ther **u**ses
- DL – **D**ifferences and **l**osses
- ME – **M**ilk **e**quivalent
- X – **E**xported
- Y – Exported intra-EU
- I – **I**mported

- J – Imported intra-EU
- F – For **f**eed
- V – Direct sales (French **v**ente?)
- H – **H**ome consumption

or a combination of them:

- AD – Delivered by farms to dairies
- DLA – Differences and losses on farms
- DLD – Differences and losses in dairies
- DME – Delivered, in milk equivalent
- DU – Total available on dairies (=total used)
- IME – Imported, in milk equivalent
- JME – Imported intra-EU, in milk equivalent
- OUD – Other uses by dairies
- RD – Returned by dairies

The codes used in the main classification are combined for particular pairs of products by compiling their digits, e.g. the aggregate of D2140 and D4200 is coded D2140_4200. Similarly, a 4-digit-code connected to another 4-digit-code by "_X_" means that it excludes the items under the second code.

Table 11. List of products

Le- vel	Product code	Exten- sion	Label	Code in Decision	Orga nic
0	D		Milk, cheese and eggs	-	
1	D0000		Aggregates of items otherwise identified with code D	-	
2	D0100		Milk products	-	
3	D0110		Fresh products	1	
3	D0120		Manufactured products	2	
2	D0200		Milk products, other than...	-	
3	D0210		Milk products, other than drinking milk, cream, butter and cheese	-	
	D0210 D		... Delivered to dairies	-	
3	D0220		Milk products, other than milk and cream	-	
	D0220 D		... Delivered to dairies	-	
3	D0230		Other milk products (than milk, cream, skimmed milk and buttermilk)	-	
	D0230 D		... Delivered to dairies	-	
1	D1000		Raw milk and cream	-	
2	D1100		Raw milk	-	
	D1100 A		... Total available on farms	-	
	D1100 D		... Delivered to dairies	-	
	D1100 DU		... Total available on dairies (=total used)	-	
	D1100 F		... For feed	-	
	D1100 DLA		... Differences and losses on farms	-	
	D1100 DLD		... Differences and losses in dairies	-	
	D1100 OUD		... Other uses by dairies	-	
3	D1110		Raw cows' milk	-	
	D1110 A		... From farm	-	Org
	D1110 D		... Delivered to dairies	-	
4	D1111		Dairy raw cows' milk	-	
	D1111 A		...- From farm	-	Org
4	D1112		Non-dairy raw cows' milk	-	
	D1112 A		... From farm	-	
3	D1120		Raw ewes' milk	-	
	D1120 A		... From farm	-	Org
	D1120 D		... Delivered to dairies	-	
3	D1130		Raw goats' milk	-	
	D1130 A		... From farm	-	Org
	D1130 D		... Delivered to dairies	-	

Level	Product code	Extension	Label	Code in Decision	Organic
3	D1140		Raw buffalos' milk	-	
	D1140 A		... From farm	-	
	D1140 D		... Delivered to dairies	-	
	D1190		Raw milk from other species	-	
	D1200		Raw cream	-	
	D1200 A		... From farm	-	
	D1200 D		... Delivered to dairies	-	
	D1200 DME		... Delivered to dairies (in milk equivalent)	-	
1	D2000		Milk and cream, not concentrated nor containing added sugar or other sweetening matter	-	
	D2000 X		... in bulk: Exports	-	
	D2000 Y		... in bulk: Exports intra-EU	-	
2	D2100		Drinking milk	11	Org
3	D2110		Raw drinking milk	111	
	D2110 V		... Direct sales		
	D2110 H		... Home consumption		
3	D2120		Whole milk (including raw milk)	112	
	D2120 I		... Imported		
	D2120 J		... Imported (intra-EU)		
4	D2121		Whole milk pasteurised	1121	
4	D2122		Whole milk sterilised	1122	
4	D2123		Whole milk uperised	1123	
3	D2130		Partly skimmed milk	113	
4	D2131		Partly skimmed milk pasteurised	1131	
4	D2132		Partly skimmed milk sterilised	1132	
4	D2133		Partly skimmed milk uperised	1133	
3	D2140		Skimmed milk		
	D2140 RA		... Returned to the farm	114	
	D2140 I		... Imports		
	D2140 J		... Imports (intra-EU)		
Σ	D2140_4200		Skimmed milk and buttermilk		
Σ	D2140_4200 A		... Total available on farms		
Σ	D2140_4200 D		... Delivered to dairies		
Σ	D2140_4200 BC		... Balance of cream deliveries		
Σ	D2140_4200 AB		... From butter and cream production		
Σ	D2140_4200 RD		... Returned by dairies		
4	D2141		Skimmed milk pasteurised	1141	
4	D2142		Skimmed milk sterilised	1142	
4	D2143		Skimmed milk uperised	1143	
2	D2200		Cream	13	Org
	D2200 V		... For direct consumption		
	D2200 IME		... Imports (in milk equivalent)		

Level	Product code	Extension	Label	Code in Decision	Organic
	D2200	JME	... Imports (intra-EU) (in milk equivalent)		
Σ	D2200_6110		Cream and butter		
Σ	D2200_6110 A		... Available on farms		
4	D2201		Cream of fat content by weight not exceeding 29 %	131	
4	D2202		Cream of fat content by weight over 29 %	132	
1	D3000		Milk and cream, concentrated or containing added sugar or other sweetening matter		
2	D3100		Powder products	22	
Σ	D3100_X_3113		Milk and cream powders, except skimmed milk powders		
3	D3110		Milk powder		
4	D3111		Whole milk powder	222	
4	D3112		Partly skimmed milk powder	223	
4	D3113		Skimmed milk powder	224	
3	D3120		Cream milk powder	221	
3	D3130		Buttermilk powder	225	
3	D3190		Other powder products	226	
	D3200		Concentrated milk	21	
	D3210		Concentrated milk not sweetened	211	
	D3220		Concentrated milk sweetened	212	
1	D4000		Buttermilk, curdled milk and cream, yogurt, kephir and other fermented or acidified milk and cream		
2	D4100		Acidified milk (yoghurts and other)	14	Org
3	D4110		Acidified milk with additives	141	
3	D4120		Acidified milk without additives	142	
2	D4200		Buttermilk	12	
1	D5000		Whey	27	
2	D5100		Whey (liquid)	271	
2	D5200		Whey (concentrated)	272	
2	D5300		Whey (in powder or in block)	273	
2	D5400		Lactose (milk sugar)	274	
2	D5500		Lactalbumin	275	
1	D6000		Butter, incl. dehydrated butter and ghee, and other fats and oils derived from milk; dairy spreads	23	
2	D6100		Butter	231	Org
	D6100 A		... Farm butter		
	D6100 AD		... Farm butter delivered to dairies		
3	D6110		Traditional butter	2311	
3	D6120		Recombined butter	2312	
3	D6130		Whey butter	2313	
2	D6200		Rendered butter and butteroil	232	
2	D6900		Other yellow fat dairy products	233	
3	D6910		Reduced-fat butter	2331	
3	D6990		Other yellow fat dairy products (without Reduced-fat butter)	2332	

Level	Product code	Extension	Label	Code in Decision	Organic
1	D7000		Cheese and curd		
2	D7100		Cheese	24	Org
	D7100 A	...	Farm cheese		
	D7100 AD	...	Farm cheese delivered to dairies		
3	D7110		All types of cheese	242	
4	D7111		Soft cheese	2421	
4	D7112		Medium soft cheese	2422	
4	D7113		Medium hard cheese	2423	
4	D7114		Hard cheese	2424	
4	D7115		Extra hard cheese	2425	
4	D7116		Fresh cheese	2426	
3	D7120		Cheese from animals	241	
4	D7121		Cheese from cows'milk (pure)	2411	
4	D7122		Cheese from ewes milk (pure)	2412	
4	D7123		Cheese from goats milk (pure)	2413	
4	D7129		Others (cheese from buffalos'milk (pure) or mixed cheese)	2414	
2	D7200		Processed cheese	25	
1	<i>D8000</i>		<i>Eggs</i>		
		
1	D9000		Other milk products		
	D9000 I	...	Imports		
	D9000 J	...	Imports (intra-EU)		
2	D9100		Drinks with a milk base	15	
2	D9200		Other fresh products (milk-based desserts, ice cream)	16	
2	D9300		Caseins and caseinates	26	
2	D9400		Chocolate crumb	28	
2	<i>D9500</i>		<i>Other organic dairy products</i>		Org
2	D9900		Other products		
	D9900 A		Other products collected from farm		

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