



Summary quality report for Total Income from Farming releases

1. Introduction

This report is an overview note that pulls together key qualitative information on the various dimensions of quality as well as providing a summary of methods used to compile the output. It relates to estimates of Total Income from Farming and aims to provide users with information on usability and fitness for purpose of these estimates. Methods and terminology used in the economic accounts for agriculture can be obtained from the following publications:

[Manual on the Economic Accounts for Agriculture and Forestry EAA/EAF 97
Agriculture in the United Kingdom](#)

2. Summary of quality

2.1 Relevance

The degree to which statistics meet current and potential user needs.

Economic Accounts for Agriculture (EAA) provide the basis for analysing the economic performance of the agricultural industry and are used by government and the European Commission to make decisions on support for the agricultural industry. The Economic Accounts for Agriculture have a legal basis in the EU regulation (EC) No 138/2004 of the European Parliament and of the Council of 5 December 2003 on the economic accounts for agriculture in the Community (as subsequently amended). They are compiled in accordance with the European System of Accounts 2010 (ESA 2010), adapted to the economic and structural developments in agriculture. Under EU law, the structure of the ESA 2010 is consistent with the worldwide guidelines on national accounting set out in the System of National Accounts 2008 (2008 SNA).

The EU regulation does not oblige any Member State to use the EAA methodology in compiling agricultural accounts for its own purposes. The UK, when compiling agricultural accounts, including the calculation of Total Income from Farming, follows the EAA but differs in some respects, principally the inclusion of Gross Fixed Capital Formation of livestock in the value of total livestock production.

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Total Income from Farming is income generated by production within the agriculture industry including direct payments and represents business profits and remuneration for work done by owners and other unpaid workers. It is the preferred measure of aggregate income for the agricultural industry in the UK and is designed to show the performance of the whole of the agricultural industry.

Three estimates of Total Income from Farming for the UK are published by Defra each year. A summary early forecast estimate is published in December of the reference year (accounting period). A first estimate is published four months after the end of the reference year (end of April) and a second estimate is published eleven months after the end of the reference year (end of November).

2.2 Accuracy

The closeness between an estimated result and the (unknown) true value.

There is no simple way of measuring the accuracy of Total Income from Farming – that is, the extent to which the estimate measures the underlying ‘true’ value of Total Income from Farming for a particular period – because it is compiled from multiple data sources.

One dimension of measuring accuracy is reliability, which is measured using evidence from analyses of revisions to assess the closeness of early estimates to subsequently estimated values. The following analyses use successive annual estimates of key aggregates and identifies reasons for revisions.

2.2.1 Revisions – general

Revisions are broadly defined as any change in value of a statistic previously released.

There is a trade-off between accuracy and timeliness. Revisions are inevitable whenever statistics are produced promptly despite the fact that some relevant information is still outstanding. Revisions to Total Income from Farming can only be avoided if either the first publication is delayed until after the final piece of information is received or if information which becomes available after the time of first publication is ignored, even if it suggests a different picture. Revisions are therefore treated as improvements in quality. They may be categorised as:

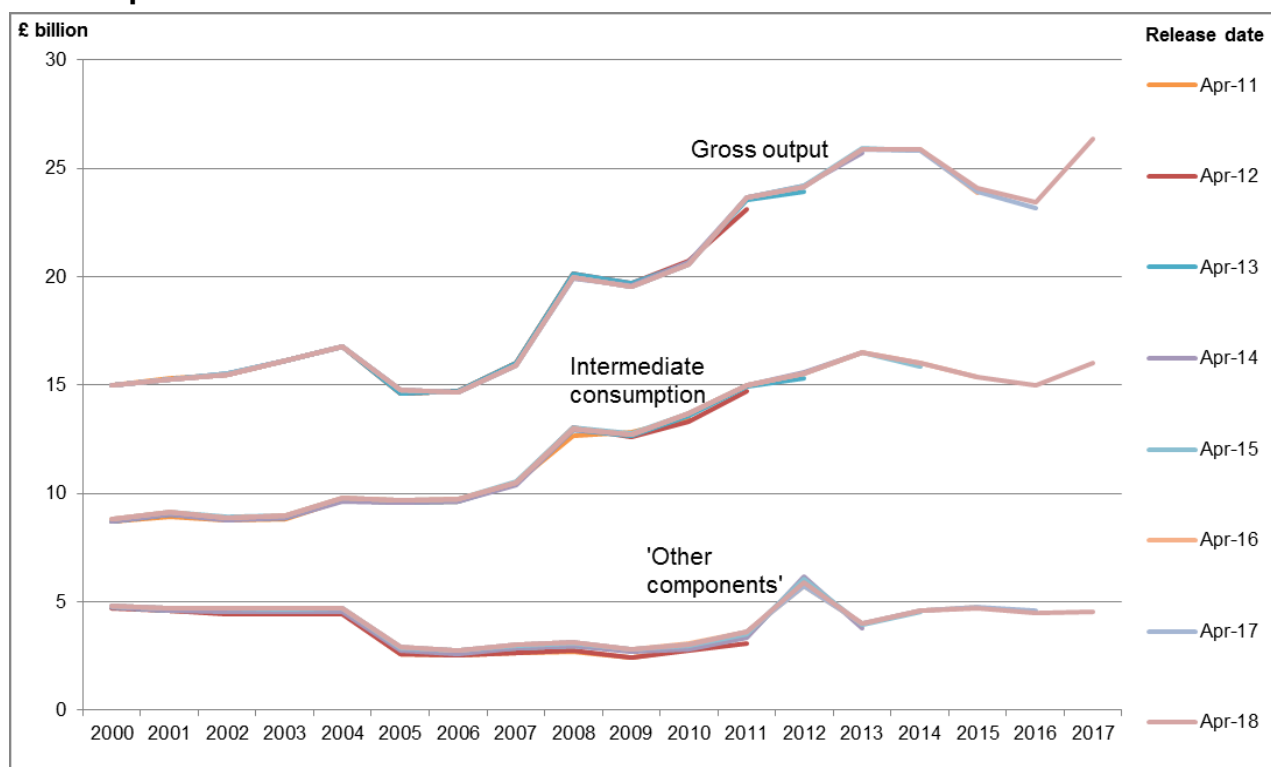
- Revisions to a source. These occur when data becomes available after statistics are compiled. This is particularly relevant to the first estimate of Total Income from Farming, which may have elements based on incomplete data for the calendar year.
- More sources. For some parts of the accounts, e.g. for most elements of intermediate consumption, forecasts are made until the actual source becomes available.
- New methods. The methods used to compile the accounts are the subject of continuous improvement as new sources become available or new methods for making estimates are developed.
- New international standards. The economic accounts for agriculture are compiled in line with international frameworks, standards and definitions. Meeting new international standards will often lead to revisions.

2.2.2 Revisions to gross output, intermediate consumption and 'other components'

Chart 1 examines the effect data revisions had on historical data and successive annual estimates of the current price value measure of gross output, intermediate consumption and 'other components' released from April 2011 to April 2018.

The chart shows that revisions had little impact over the period of interest (2010-17), i.e. from the time 2010 data published in April 2011 to 2017 data published in April 2018.

Chart 1: Revisions to gross output, intermediate consumption and 'other components', current prices values



Gross output

Between April 2011 and April 2018 revisions have occurred owing to:

- first estimates being updated with more complete data for the year
- methodological changes being made to some components including:
 - the calculation of the value of potatoes; a data quality check identified certain limitations in the methodology to improve figures for stock feed and source data used for estimating the tonnage of potatoes sold for human consumption [introduced in April 2015 and 2017].
 - the calculation of the value of other animals for meat production back to 1985; following a methodology review of all minor items [introduced in April 2015].
- estimates of protein crops were introduced to meet new international standards [introduced in April 2014].

- revisions to the estimates Gross Fixed Capital Formation (GFCF) in Cattle back to 2005; following identification of an error in the “Number of entries into the breeding herds” which is a fundamental part of the overall calculations [introduced in April 2014].

The average (absolute) revision between the first estimate and the estimate published the following year for the period was +0.9%. The revisions ranged between +0.3% (April 2014) and +2.0% (April 2011).

Intermediate consumption

Between April 2011 and April 2018 revisions have occurred owing to:

- estimates for most costs are initially forecasted replaced with actual data the following year.
- methodological changes have been made to some components including:
 - changes to the cost of plant protection products to correct an error in the interpretation of the data [introduced in April 2015].
 - changes to the cost of seeds to rectify an error in the data following a review of methodology [introduced in April 2015].
- inclusion of a new data source in the estimate to the cost of fertilisers [introduced in April 2014].
- revisions to animal feed data to correct errors found when the straight feed data was reviewed [introduced in April 2015].
- data source revisions to Financial Intermediation Services Indirectly Measured (FISIM) time series, resulting in relative changes between interest costs and FISIM costs [introduced in April 2015].

The average size of the (absolute) revision between the first estimate and that in the following year between 2010 and 2017 was 0.8%. The revisions ranged between -1.0% (April 2010) and +1.8% (April 2012).

‘Other components’

‘Other components’ is used here to refer to the aggregated value of ‘consumption of fixed capital’, ‘other taxes on production’, ‘other subsidies on production’, ‘compensation of employees’, ‘rents’ and ‘interest’. It may also be calculated as the value of Gross Value Added at basic prices *minus* the value of Total Income from Farming.

Between April 2011 and April 2018 revisions have occurred owing to:

- estimates being initially forecasted and then updated with actual data
- methodological changes being made to some components, including:
 - the calculation of the consumption of capital formation; extension of the period over which the capital is consumed and change in the profile of consumption [introduced in April 2015].
 - the calculation of rent data; an improved method of calculating land area [introduced in April 2015 and 2016].

- revisions to estimates of maintenance owing to revisions to a data source [introduced in April 2013].
- data source revisions to interest time series, resulting in relative changes between interest and FISIM costs [introduced in April 2015].

The average size of the revision between the first estimate and that in the following year between 2010 and 2017 was +3.3%. The revisions ranged between -2.8% (April 2016) and +10.9% (April 2011).

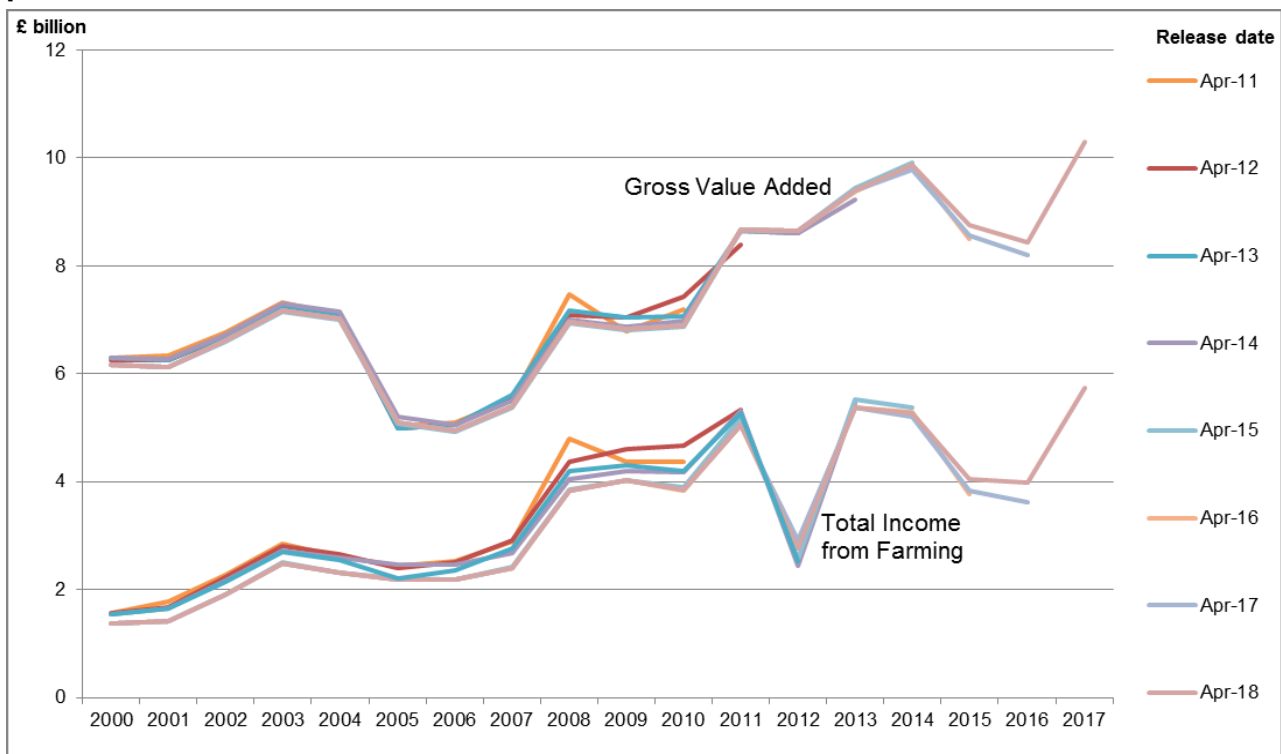
2.2.4 Revisions to Gross Value Added and Total Income from Farming

‘Gross Value Added’ is derived as the difference between the ‘value of output’ and the ‘value of intermediate consumption’, while ‘Total Income from Farming’ is derived as ‘Gross Value Added’ less ‘consumption of fixed capital’, ‘other taxes on production’, ‘compensation of employees’, ‘rents’ and ‘interest’ plus ‘other subsidies on production’ (i.e. the ‘other components’ referred to on page 4).

As a result, both Gross Value Added and Total Income from Farming are sensitive to small percentage revisions in the values of output and intermediate consumption, and in the case of Total Income from Farming, revisions to the ‘other components’ (see also the sensitivity analysis on page 6).

Chart 2 examines the effect data revisions had on successive annual estimates of the current price value measure of Gross Value Added and Total Income from Farming, released from April 2011 to April 2018.

Chart 2: Gross Value Added at basic prices and Total Income from Farming, current prices values



Gross Value Added at basic prices

Chart 2 shows that the different versions of the series are consistent however the impact of the aggregated revisions to output and intermediate consumption can be seen.

The average (absolute) revision between the first estimate and the estimate published the following year for the period 2010-17 was 1.9%. The revisions ranged between -0.5% (2014), a consequence of a +0.3% revision to output and +0.8% revision to intermediate consumption, and +3.2% (2011), a consequence of a +2.0% revision to output and +1.3% revision to intermediate consumption.

Total Income from Farming

The cumulative impact of revisions to the many elements that make up Total Income from Farming is shown in Chart 2. The chart shows that the different versions of the series is broadly consistent over the period but, as it is sensitive to small percentage change in the 'values of output', 'intermediate consumption' and the 'other components', revisions can be very pronounced.

The average size of the revision between the first estimate and that in the following year between 2010 and 2017 was 3.8%. The revisions ranged between -4.0% (2012) and +10.4% (2016).

2.2.7 Sensitivity analysis of Total Income from Farming

The estimate of Total Income from Farming is sensitive to changes in output, intermediate consumption and 'other components'. 'Other components' refers to the aggregated value of consumption of fixed capital, other taxes on production, other subsidies on production, compensation of employees, rents and interest, which may also be calculated as the difference between the values of Gross Value Added at basic prices and Total Income from Farming.

The extent to which Total Income from Farming is dependent on small shifts in the values of output, intermediate consumption and 'other components' is illustrated in Table 1 using 2017 values. In 2017 if the value of output was to move by +1.0%, then the value of Total Income from Farming would move by 4.6% while if the value of intermediate consumption was to move by +1.0%, then the value of Total Income from Farming would move by -2.8%. Total Income from Farming is less sensitive to changes in the value of 'other components'; if this was to move by +1.0% then the value of Total Income from Farming would move by -0.8%.

In practice, revisions are likely to occur to all of these aggregates. Scenario 6 illustrates a situation where output moves by -1.0% and intermediate consumption and 'other components' each move by +1%, which leads to a -8.2% revision to Total Income from Farming.

Table 1: Sensitivity Analysis – Total Income from Farming

	Baseline (2017) £m	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
Output	26 340	1.0%	0.0%	0.0%	1.0%	0.0%	-1.0%
Intermediate Consumption	16 040	0.0%	1.0%	0.0%	1.0%	1.0%	1.0%
Gross Value Added at basic prices	10 300	2.6%	-1.6%	0.0%	1.0%	-1.6%	-4.1%
Other Components ¹	4 557	0.0%	0.0%	1.0%	1.0%	1.0%	1.0%
Total Income from Farming	5 743	4.6%	-2.8%	-0.8%	1.0%	-3.6%	-8.2%

¹ The value of 'other components' is the aggregated value of 'consumption of fixed capital', 'other taxes on production', 'other subsidies on production', 'compensation of employees', 'rents' and 'interest', or the difference between the values of Gross Value Added and Total Income from Farming.

2.2.8 Other analysis

Broader measures for examining accuracy include:

- analysis of data content available at different stages of the publication process for Total Income from Farming. Approximations of data content available for each stage are presented in table 2 below, for example there is around 90% content data available to produce value of output estimates by April of the following year yet only 30% content data available to produce intermediate consumption estimates.
- describing how basic 'raw' data are transformed by a series of adjustment to give the statistical estimates that are used to compile the agricultural accounts. An inventory of methods will be published in due course.

Table 2: Data content available at different stages of the publication process for Total Income from Farming; approximation as a % of value

	Stages of the publication process		
	April year n+1	November year+1	April year+2
Output	90%	98%	100%
Intermediate consumption	30%	80%	100%
Subsidies data	100%	100%	100%
Other costs	55%	90%	100%

n = reference year

2.3 Timeliness and punctuality

Timeliness refers to the lapse of time between publication and the period to which the data refer. Punctuality refers to the time lag between the actual and planned dates of publication.

A first estimate of Total Income from Farming is published four months after the accounting period in April and a second estimate of Total Income from Farming is published nine months after the accounting period in November 2018.

A major improvement in timeliness was achieved with the first publication of an early forecast of Total Income from Farming for 2017 in February 2018. These summary statistics were published in the interests of openness and transparency as they were already in the public domain (<http://ec.europa.eu/eurostat/data/database>) to meet a requirement by the European Commission. Subsequent annual early forecasts will be published in December, a month before the end of the accounting period.

Total Income from Farming release dates are pre-announced through a 12-month release calendar available on the statistics announcement page on gov.uk <https://www.gov.uk/government/statistics>. The specific release date should be confirmed at least four weeks in advance, as outlined in the UK Statistics Authority Code of Practice framework <https://www.statisticsauthority.gov.uk/code-of-practice/the-code/trustworthiness/t3-orderly-release/>.

2.4 Accessibility and clarity

Accessibility is the ease with which users are able to access the data, also reflecting the format(s) in which the data are available and the availability of supporting information.

Clarity refers to the quality and sufficiency of the metadata, illustrations and accompanying advice.

Total Income from Farming statistics are disseminated via electronic publication. To meet accessibility standards statistics are published in pdf(a) document and ODS dataset form. These may be downloaded from the gov.uk website free of charge at 9.30am on the day of release. Different formats may be requested.

Contact details of the lead analyst for enquiries about the Total income from Farming series are published on releases.

2.5 Comparability

The degree to which data can be compared over time and domain.

Every effort is made to ensure that the series is comparable over time. A comparable time series is available back to 1973. Where possible, changes to methodology are applied to the whole series to ensure this comparability is maintained.

Since international standards such as SNA 2008 and ESA 2010 are used in the production of the agricultural accounts and methods are defined in EU legislation, the figures should be directly comparable with the accounts of other countries and Member States. The revision policy of other countries may differ however and caution should be exercised when comparing historic data.

2.6 Coherence

The degree to which data from different sources or methods, but which refer to the same phenomenon, are similar.

Data in the Total Income from Farming releases are broadly consistent with the following Defra output:

Farm Business Income

Inconsistencies occur because:

- Farm Business Income is designed to compare performance across different types of farming while Total Income from Farming assesses the economic situation for the whole of the UK agricultural sector.
- Farm Business Income covers the 12 month period March to February while Total Income from Farming covers calendar years.
- The Farm Business Survey, which produces estimates of Farm Business Income, has a higher threshold for inclusion than the aggregate agricultural accounts, which produces Total Income from Farming.
- Farm Business Income treats stocks as the change in the book value of stocks between the start and end of the accounting year while Total Income from Farming treats stocks as the physical change in stocks valued at average calendar year prices.
- The first estimate of Total Income from Farming produced in April is made before results from the Farm Business Survey are available for use in making estimates of inputs and other costs so estimates of Farm Business Income that are published in October following the accounting year will be inconsistent with estimates of Total Income from Farming until these are revised in the following November.

3. Summary of methods

Defra produces a summary early forecast and a comprehensive set of annual production and income accounts twice yearly of which the main components are Total Income from Farming estimates. Indicators of economic activity such as output, intermediate consumption, gross value added and net value added, are all integrated within the accounts.

The accounts are estimates of an underlying reality using an output or production approach based on statistical surveys, administration data, forecasts and model-based estimates, and are not compiled though 'accounting' in the common sense of the word.

For the early forecast published in December, forecasts and models are used to estimate components for which survey results or other data are not yet available. Summary statistics are only produced at this stage. Later estimates are based on more complete information. See section 3.1 production stages for more information.

For the first estimate published in April, forecasts and models are used to estimate components, in particular intermediate consumption and other costs, for which survey results or other data are not yet available.

The key principle that drives estimation of Total Income from Farming in the UK is that the purpose is to analyse the production process and primary income generated by the

agricultural industry thus the accounts are based on the industry concept rather than institutional sectors or sub-sectors.

3.1 Production stages

The main stages of the production process for Total Income from Farming are outlined here.

3.1.1 Early forecast. This forecast is published one month before the end of the accounting period (i.e. calendar year).

The production outputs are largely based on survey results and administration information available up to early October applying the relative change over 12 months to these aggregated data. Most intermediate consumption and other costs use modelling techniques and are derived from price data and estimates of volume changes based on professional advice.

A level of estimation is necessary for variables where no market information is available. As a result the data cannot be produced with the same statistical reliability as the later first and second estimates detailed below. Only summary high level statistics are published at this stage.

First estimate. This estimate is published four months after the end of the accounting period.

It is based on 65 per cent 'actual' data by value from survey results and administration data, and on model-based estimates largely for output or production data, with most intermediate consumption and other costs being derived from price data, estimates of volume changes based on professional advice, and a variety of modelling techniques.

A full dataset for the production and income account with revisions to previous years is published (see also 'third estimate'). Other analyses, such as volume indices and national breakdowns are published in the following month in the statistical compendium, 'Agriculture in the United Kingdom'.

3.1.2 Second estimate. This estimate is published eleven months after the end of the reference year.

The estimate of Total Income from Farming is improved by basing most estimates of intermediate consumption and other costs on the results of the Farm Business Survey results for England that are published in October. At this point, Total Income from Farming is based on 90 per cent of actual data by value. A revised dataset for the aggregate agricultural accounts is published.

3.1.3 Third estimate. This estimate is published in April of year $n + 2$ following the reference year at the same time as the first estimate for the next reference year (see 'First estimate' above).

In this release, Defra publishes a full dataset incorporating estimates made by the devolved administrations in compiling agricultural accounts for Scotland, Wales and Northern Ireland. At this point, the estimate of Total Income from Farming is based on 100% 'actual' data by value.

Methodological improvements may also be made and, where possible, applied to the whole series to ensure comparability of the time series is maintained.

3.2 Deflation

Aggregate agricultural accounts are produced at current prices and give the value of Total Income from Farming at specific points in time. Growth in Total Income from Farming at current prices reflects the effect of inflation as well as real growth in Total Income from Farming. Total Income from Farming is ordinarily expressed in real terms, i.e. excluding inflationary issues. It is deflated using the Gross Domestic Product deflator.

A principal change since the quality report was published in July 2013 is the replacement of Retail Price Index (RPI) by the Gross Domestic Product (GDP) deflator to convert current prices into real term prices. This followed the Retail Price Index (RPI) losing its 'National Statistics' accreditation. At the time various options were considered and consultation with the devolved administration and the Office of National Statistics took place before the GDP deflator was selected.

4. Sources of data and methods of calculation for compiling economic accounts for agriculture

One of the main characteristics of economic accounts for agriculture is the adoption of the 'quantity x price' formula when measuring the output of the large majority of products.

The valuation of crop output is normally based on resources, i.e. the estimate of quantities produced (harvested) based on estimates of areas under crops and yields, or on uses, i.e. on estimates of purchases by the user branches of agricultural products, exports net of imports, to which should be added certain quantities used for intermediate consumption by the agricultural industry, changes in producer stocks and use for own account (much of which is own final consumption). The latter approach can be highly appropriate in cases where the buyers of these agricultural products are readily identifiable and the four other components of uses are limited (for example, products requiring preliminary processing before they can be used, such as sugar beet, tobacco, etc.).

Statistics on slaughtering, exports/imports of live animals and the size of herds are the main sources of data for measuring the output of animals. The output of animal products (mainly milk) is generally estimated using sales to user branches (dairies, packers) because of the specific uses to which they are put.

Most intermediate goods (seeds and planting stock, fertilisers, pesticides, etc.) are largely based on representative samples of farm business accounts with averages being raised by information from farm structure surveys.