

Methodology and Quality Note:

Farm Income Estimates
derived from the Farm Business Survey for Scotland

Rural and Environment Science and Analytical Services

Agriculture Statistics
08/03/2018

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1. PURPOSE

The purpose of this note is to:

- provide an overview of the methodology behind the Farm Business Survey (FBS) for Scotland (previously called the Farm Accounts Survey (FAS)) along with descriptions of the main income estimates produced from the data collected from this survey
- provide definitions of terms used in the published results
- describe the quality of the information collected in this survey and the headline measure of income, namely Farm Business Income (FBI)
- provide information about the relevance of the FBS and why the information is required

FBI estimates for 2016-17 were first published in the [Scottish Farm Income Estimates 2016-17](#) National Statistics publication, released on the 08th March 2018.

Farm Business Survey results are also published in the National Statistics publication 'Economic Report on Scottish Agriculture', which is released in June each year at the following internet address, <http://www.gov.scot/Topics/Statistics/Browse/Agriculture-Fisheries/PubEconomicReport>

The Scottish Government's Agriculture National Statistics products were assessed by the UK Statistics Authority (UKSA) in 2011. As part of the assessment process the Scottish Government provided documented evidence (Written Evidence for Assessment, WEFA) of compliance with the Code of Practice for Official Statistics to UKSA. In December 2011 UKSA published a report of their assessment, within which the status of the two products referenced above was confirmed as being National Statistics; subject to the implementation of recommended actions detailed in the assessment report. Among the requirements were the following in relation to outputs based on the results of the Farm Business Survey:

"Publish full details about the methods used to compile farm income estimates";

"Publish information about the quality of agriculture statistics, including the main sources of bias and other error".

This document seeks to address these requirements. More information regarding National Statistics is available from the UKSA's website, <http://www.statisticsauthority.gov.uk>.

In June 2013 UKSA approved the National Statistics Designation of these products.

2. METHODOLOGICAL NOTE

2.1 Survey Process

Estimates of farm income in Scotland (including Farm Business Income (FBI), which is the headline measure produced by the Scottish Government) come from the Farm Business Survey (FBS) (previously called the Farm Accounts Survey (FAS)) for Scotland, which is based on a sample of approximately 500 farms. Other estimates of farm income that are derived from the FBS include; Net Farm Income, Cash Income, Farm Corporate Income and Farm Investment Income.

Annual data collection for the FBS is carried out by Scotland's Rural College (SRUC) on behalf of the Scottish Government (SG). SRUC recruits a sample of farms (stratified appropriately) and collects data directly from them through farm visits and detailed examination of the each business's books and paperwork. When complete, the processed data is anonymised and passed to the Scottish Government for analysis and publication.

Currently, around 500 fully-reconciled farm accounts are compiled each year, constructed from the information supplied by co-operating farmers. SRUC collects detailed financial and economic information (and some physical information, such as crop areas and stock numbers) for the farm business on outputs, inputs, income and balance sheets. Imputed items are estimated for non-cash transactions (e.g. inputs of family labour) to complete the economic picture of the business. Information is also collected where possible for the farmer and spouse on their non-farming income (e.g. from other employment or self-employment, investments, pensions, and social payments) and on the hours spent earning other incomes. The financial information is collected to observe the overall performance of the farm business for a particular year and to contribute to the construction of a full profit-and-loss account and a balance sheet. The physical data are used primarily to classify the farm according to its type and size.

The FBS results are obtained from a sample of farms that are stratified by farm type and size. The survey does not currently include farms predominantly engaged in horticulture, poultry, egg production or pig production. The coverage of the survey is restricted to those farms which have considerable economic activity (at least 25,000 Euros of output) and are not considered as spare-time farms (have a Standard Labour Requirement (SLR) of more than 0.5).

2.2 Classification of Farms

2.2.1 Farm Type

The classification is based on detailed sub-types as defined in the EC farm typology¹, which have been grouped together where required to give the types shown below.

The classification is based on the relative importance of the various crop and livestock enterprises on each farm assessed in terms of standard output (an economic measure of output less variable costs). The method of classifying each farm is to multiply the area of each crop (other than forage) and the average number of each category of livestock by the appropriate standard output, with the largest source of output determining the type of farm. The list below defines the main types that are reported in Scottish Government Agriculture statistics products.

Type	Definition
Specialist Sheep (LFA)	Farms in the less-favoured areas with more than two-thirds of the total standard output coming from sheep.
Specialist Beef (LFA)	Farms in the less-favoured areas with more than two-thirds of the total standard output coming from cattle.
Cattle and Sheep (LFA)	Farms in the less-favoured areas with more than two-thirds of the total standard output coming from sheep and beef cattle together.
Cereals	Farms where more than two-thirds of the total standard output comes from cereals and oilseeds.
General Cropping	Other farms where more than two-thirds of the total standard output comes from all crops.
Dairy	Farms where more than two-thirds of the total standard output comes from dairy cows.
Lowground Cattle and Sheep	Farms NOT in the less-favoured areas with more than two-thirds of the total standard output coming from sheep and beef cattle.
Mixed	Farms where no enterprise contributes more than two-thirds of the total standard output.

2.2.2 Standard Output:

The standard output of an enterprise is an estimate of the average output value for every unit of production. It is defined as the estimated worth of crops and livestock without taking into account the costs incurred in the process.

¹ COMMISSION DELEGATED REGULATION (EU) No 1198/2014, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014R1198&from=en>

2.2.3 Farm Size:

The survey covers farm businesses with a Standard Labour Requirement² of 0.5 and above and covers most main farm types in Scotland, excluding horticulture, specialist pig and specialist poultry producers. Around 12,000 holdings are represented at present.

Since 2003/04, farm size has been defined in terms of standard labour requirements. Standard labour requirement is equal to 1,900 hours of labour per year. The size groups are:

Size Group	SLR definition	Description
Small	0.5 < 2.00 SLR	This represents broadly a one- two person full-time farm.
Medium	2 < 3 SLR	This represents broadly a two- three person full-time farm.
Large	3 + SLR	This represents approximately full-time farms with more than three people full-time.

Note: Actual farm employment may be above or below the labour requirements listed in the table above; the values quoted refer to an average position.

On all farms the large size group is defined as 3 SLRs and over.

2.2.4 Weighting:

Where figures for all sizes are shown, these refer to the above groups weighted together. The figures for all sizes and all types are weighted averages based on the June Census distribution of agricultural holdings in Scotland in the relevant year, by type of farming and size of business.

The sample is drawn from a stratified population of 8 farm types by 3 size groups. Within each stratum, a single weight is calculated as the ratio of the number of farms in the population and in the sample. This weight, when applied to each farm, represents the number of times that farm data must be replicated in order to 'represent' farms not selected for the sample. This weight is applied to all variables.

The weights are only applied when calculating results for all types and all sizes of farms. The results for farm types by size are the arithmetic mean of all the farms in that particular size group and farm type.

² Standard Labour Requirements represent the approximate average labour requirement for a livestock or crop enterprise. The annual hours of a full-time worker is 1900 hours.

2.3. Sampling

The sampling strategy of the FBS is based on a stratified simple random sample and is effectively designed as a panel survey with little change in the membership of the sample between years. The sampling frame for the survey is the Scottish Agricultural Census, according to the specific requirements of the FBS sample in regards to farm type and size.

An important feature of the survey is the measurement of changes in farm incomes and in incomes from diversified activities for particular types and sizes of farm for at least two years. To achieve this, it is necessary to maintain farms in the sample surveyed over a number of years. Once recruited, the farm may stay in the sample for an unlimited time period. The involvement of farms in the FBS is entirely voluntary.

If farms drop out of the survey, replacements are selected depending on which farm types and sizes are required to achieve a sample which is representative of the population of farms in Scotland. Replacement farms are then selected at random from within these groups.

The survey is not carried out on a calendar-year basis but based on farms' financial years. The exact period covered by the survey, for any given year, will vary across the sample depending on individual businesses' accounting year ends, although they all centre on the same cropping period. For example, the 2016-17 accounts all centre on the 2016 production and subsidy year. The spread of closing valuation dates from the autumn of one year to the spring of the next means that (unavoidably) some of the 2016-17 accounts relate to the 2016 winter whilst others relate to that of 2017. Diagram 1 below shows the time period covered by the 2016-17 FBS.

Figure 1: The time period covered by the 2016/17 farm accounts survey

Nov 2015	Dec 2015	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2016	Jun 2016	Jul 2016	Aug 2016	Sep 2016	Oct 2016	Nov 2016	Dec 2016	Jan 2017	Feb 2017	Mar 2017	Apr 2017	May 2017	Jun 2017	Jul 2017	Aug 2017	Sep 2017	Oct 2017	Nov 2017	Dec 2017					
	Account year for November-ending farms																													
		Account year for January-ending farms																												
			Account year for March-ending farms																											
				Account year for May-ending farms																										
	Period covered by the 2016-17 survey																													
													Fieldwork period for 2016-17																	
	2016 cropping year (and period for which subsidy and payments are made)																													

2.4 Definition of Terms

2.4.1 Farm Income Measures

Farm Business Income

Farm Business Income (FBI) represents the return to all unpaid labour (farmers and spouses, non-principal partners and directors and their spouses and family workers) and on their capital invested in the farm business, including land and buildings.

FBI is equivalent to financial Net Profit although, in practice, they differ because Net Profit is derived from financial accounting principals whereas FBI is derived from management accounting principles. For example, in financial accounting, output stocks are usually valued at cost of production whereas in management accounting they are usually valued at market price. In financial accounting, depreciation is usually calculated at historic cost whereas in management accounting it is often calculated at replacement cost.

The FBI measure is designed to capture the return to the entire farm business and therefore also includes income from diversified activities on the farm. FBI is also used in England, Wales and Northern Ireland and is used as the headline UK farm income measure³.

Net Farm Income

Net Farm Income (NFI) represents the return to the farmer and spouse for their manual and managerial labour and on the tenant-type capital in the farm business. It is intended as a consistent measure of the profitability of tenant-type farming. NFI is not a proxy either for farm business income or for farm household income.

- To represent the return to the farmer and spouse alone, a notional deduction is made for any unpaid labour provided by non-principal partners and directors, their spouses and by others; this unpaid labour is valued at average local market rates for manual agricultural work.
- To confine the measure to the tenant type activities and assets of the business, an imputed rent is deducted for owner occupied land and buildings and for landlord-type improvements made by the tenant; no deduction is made for interest payments on any farm loans, overdrafts of mortgages and any interest earned on financial assets is also excluded.

Cash Income

Cash Income is the difference between total revenue and total expenditure. Revenue is receipts adjusted for debtors and expenditure is purchases adjusted for creditors. It is assumed therefore that all end of year debtor and creditor payments are settled in full, even though this may happen beyond the end of the accounting year. Cash income represents the cash return to the group with an entrepreneurial interest in the business (farmers and spouses, non-principal partners and directors and their

³ FBI results for all UK countries are published in “Agriculture in the United Kingdom” <https://www.gov.uk/government/collections/agriculture-in-the-united-kingdom>

spouses and family workers) for their manual and managerial labour and on their investment in the business.

Farm Corporate Income

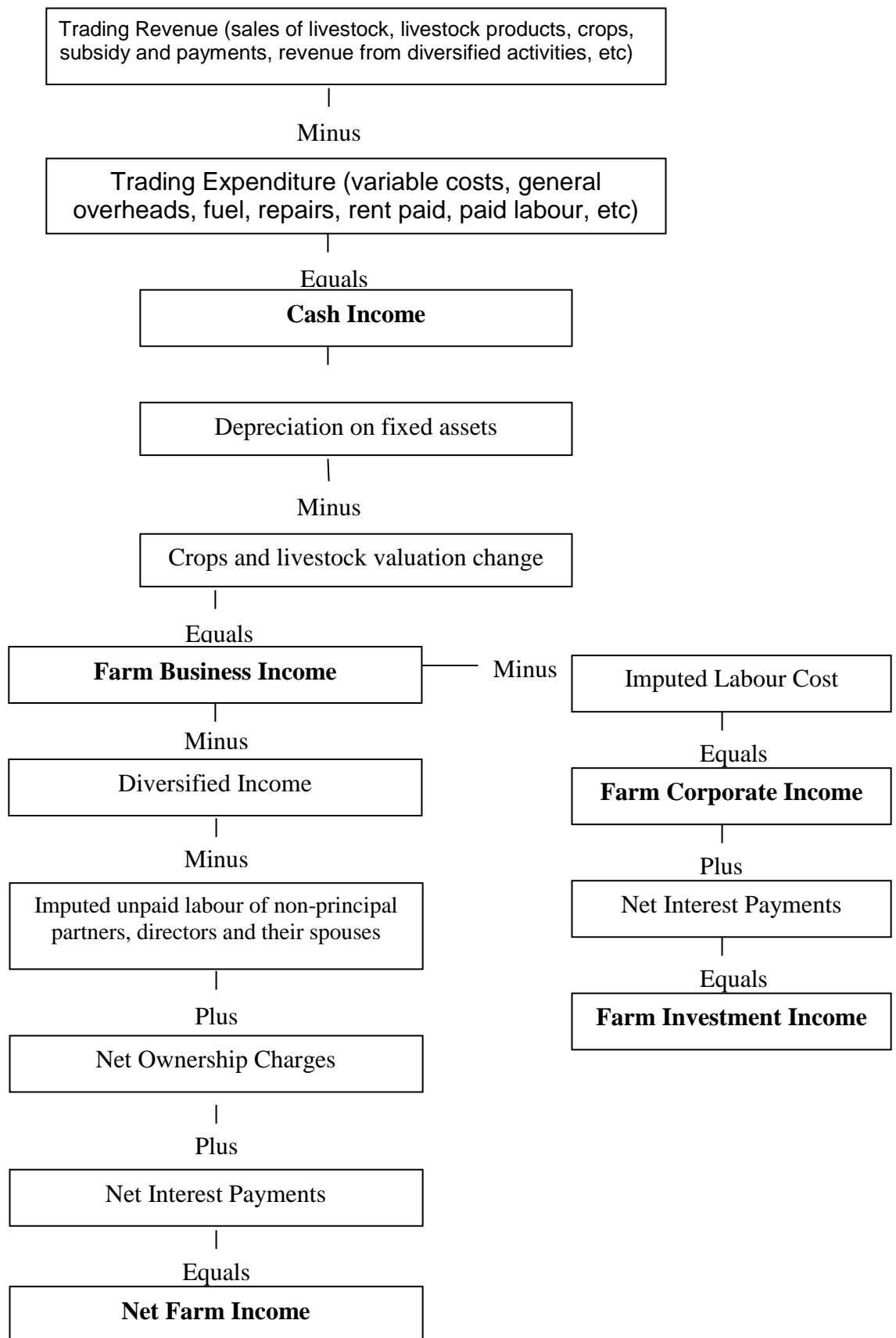
Farm Corporate Income represents the return to the owners of the business on all their capital invested. It is derived by deducting unpaid labour, both manual and managerial, from Farm Business Income. This allows the profitability of sole traders and partnerships to be compared directly with that of companies. Currently it is possible to estimate unpaid manual labour but not unpaid managerial labour and so the data are only approximate.

Farm Investment Income

Farm Investment Income represents the return on all capital invested in the farm business whether borrowed or not. It is derived by adding net interest payments to Farm Corporate Income. Since currently the data for Farm Corporate income are only approximate, so too are the data for Farm Investment Income.

The relationship between these different income measures is shown in Diagram 2:

Diagram 2: Flow Chart Showing the Construction of the Main Economic Measures Derived from the FBS Data



2.4.2 Accounting Terms

Only some of the items making up output and input are shown separately in the tables, but each is defined to show what comprises the totals.

Crop Output

Sales, including produce to farmhouse and labour, adjusted for debtors at the beginning and end of year and for valuation change. The value of non-fodder crops used on the farm for feed or seed is included.

Cereals

Wheat, barley, oats and mixed corn.

Livestock Output

Sales, including produce to farmhouse and labour, adjusted for debtors at the beginning and the end of year and for valuation change, less purchases of livestock and livestock products for resale. The value of milk from the dairy herd fed to stock is included. Breeding Livestock Stock Appreciation is excluded. The Revenue Value Pence per Litre is calculated on Milk sold.

Miscellaneous Output

Miscellaneous produce to farmhouse and labour, revenue from contracting and some other miscellaneous items, but excluding grants and subsidies, adjusted for valuation change.

Subsidy and Payments

Includes Basic Payment scheme (BPS) and LFASS payments and all grants except those paid in respect of permanent improvements and those deducted from expenditure.

TOTAL OUTPUT

Crop Output, Livestock Output, Miscellaneous Output and other Grants, Subsidy and Payments.

Inputs

Payments and non-cash inputs (e.g. unpaid labour, rental value) adjusted for creditors at the beginning and end of the year and for valuation change.

Feeds

Expenditure on feeds adjusted for valuation change. The value is included of (a) milk from the dairy herd fed to stock, and (b) home-grown non-fodder crops fed to stock.

Seeds

Expenditure on seeds adjusted for valuation change. The value of home-grown seed grain and potatoes is included.

Labour

Wages and employer's National Insurance contributions, payments in kind, salaried management are all included.

Fertilisers

Expenditure on lime and fertilisers, adjusted for valuation change.

Machinery (excluding Depreciation)

Expenditure on machinery repairs, small tools, contract work and fuel and oil, less allowances for private use.

Miscellaneous

Electricity, vehicle taxes, insurance and secretarial costs, adjusted for valuation change.

Other Livestock Expenses

Veterinary charges, haulage and sundry expenses.

Other Crop Expenses

Crop protection, sundry crop expenses and water for irrigation.

Land and Building Costs

Rent paid by tenants, rental value of owner-occupied farms, imputed rent on tenant's improvements. Rates paid on cottages and the business share of the farmhouse. Depreciation and repairs by occupiers.

Depreciation

Until 2009/10, depreciation on the investment in farm buildings was calculated using the straight line method. This method involves removing a set percentage of the original value of the asset each year over the expected useful life of the asset, for assets such as buildings the useful life was estimated at ten years.

The value of farm buildings was reflected by increasing the heritable valuation of the property by the cost of the buildings. Many farm buildings are still in use after ten years and would still be expected to retain some market value, reflected in the heritable valuation of the property, despite buildings having reached the end of their expected useful life. However, this approach was prone to underestimation of overall farm values because of the subjective nature of the valuation.

To correct this undervaluation a new method, component valuation, has been implemented for final 2009/10 and first 2010/11 data; collected in the 2011 survey year. This approach is more objective and involves breaking the valuation of a farm into its chief component parts; bare land, farmhouse, farm cottages, traditional farm buildings, modern farm buildings and land improvements (e.g., fencing, drainage).

Valuations: Traditional buildings, if in use as farm buildings, and cottages (most of which are over 30 years old) are given a nominal residual value of £5,000 and subject to annual revaluation. Bare land is annually valued based on the "whole farm" market. Farm house valuations are based on cost of construction materials and improvements. Values for modern buildings and improvements are initially valued on construction costs and are subject to revaluation.

Depreciation: the new method uses a 10% depreciation rate for all buildings and improvements on a diminishing balance method; this means that 10% of the current value of the asset will be deducted each year and means that assets will retain a residual value at the end of the expected useful life of the asset. This method of depreciation is applied to all assets, including short-life improvements. Bare land and farm houses are not depreciated

The new method of valuing and calculating depreciation on assets has been applied to both the 2009/10 and 2010/11 results contained in statistical releases during the 2012 calendar year. The changes have no impact on estimates of income as these do not include asset valuations, but will increase the value of assets compared to previously published results and therefore increase the estimated Net Worth shown in the balance sheets.

The new depreciation and valuation methodology is consistent with the methods applied in the Farm Business Survey in England and Wales.

Breeding Livestock Stock Appreciation

The part of the change in the value of breeding livestock that is due to changes in price. It is calculated for adult female cattle, sheep and pigs.

Balance Sheets

The balance sheets show the average opening and closing valuations of assets, liabilities and net worth (assets minus liabilities) of the farm business for each farm type, reported according to tenure type. This has been split by tenure type to account for the different financial structures of owner-occupied, tenanted and mixed tenure farms.

The tenure definitions are as follows:

Tenure Type	Definition
Owner-occupied	Farms on which all of the area used for agriculture is owner-occupied.
Tenanted	Farms on which all of the area used for agriculture is tenanted.
Mixed Tenure	Farms with any other tenure arrangements. This includes farms with landlord-tenant partnerships and farms on which the area used for agriculture is split between two or more different tenure types.

The balance sheets relate to the business rather than the farmer and therefore any other assets belonging to the latter are excluded.

For land and buildings, crops and livestock, the basis of valuation is conservative market price, while for machinery and equipment it is depreciated replacement cost. Particularly in the case of land and buildings, the balance sheet entries need to be treated with some caution in respect both of the absolute level and of the year-to-year trend, and it follows that this caveat extends to dependent figures such as net worth.

Quartiles

To produce performance bands by quartiles, FBS results were ranked by FBI and averages produced for the output and input values categories reported for the top 25 per cent and bottom 25 per cent by farm type and reported against the full analysis for that particular farm type.

Non-Farming Income

Farmers are asked to indicate into which of ten income ranges the joint non-farming income of the farmer and spouse falls for each of six separate sources of income. The sources of income are listed below:

Source of Income	Description
Off-farm employment	Paid employment off the farm.
Off-farm self-employment	Businesses (other than another farm) owned or operated away from the farm holding. Director's fees are included here.
Investment	Interest receipts on personal bank, building society and similar accounts. Rental income deriving from property off the farm and some dividends on shares are also included here.
Pensions	Includes income from retirement, widow's and disability pensions as well as from occupational and state pensions.
Social Payments	Includes payments such as child benefit and family credit.
Other off-farm income	All other off-farm income. Various commissions, and retainers, come into this category.

DIVERSIFIED ACTIVITIES RECORDED IN THE FARM BUSINESS SURVEY

Activity

Processing and Retailing of Farm Produce

Processing of farm produce
Processing of cereal products- excluding alcohol
Processing of horticultural products- excluding alcohol
Alcoholic products from farm produce
Processing of cow's milk
Processing of other livestock products
Retailing of farm produce
Retailing of farm produce through dedicated farm shop
Retailing of farm produce through direct sales from farmhouse
Retailing of farm produce through other channels (e.g. farmers' markets, side of road, delivery box scheme)
Gross profit on resale of purchased agricultural produce
Washing/ grading of farm produce
Vegetable and fruit washing/ grading/ packing
Other washing/ grading

Rent and Wayleaves (nb. Not including tourist accommodation)

Cash rent for sub-letting all or part of farmhouse
Cash rent for farm cottages let to people not connected with the operation of the farm (ie typical residential lets)
Other rents where farm buildings are rented for commercial or other purposes not connected with the core farm business.
Other payments in kind where farm buildings or land are rented for commercial or other purposes not connected with the core farm business
Mobile telephone masts
Wind turbines
All other renewable energy

Recreation including activities such as shooting, fishing, nature trails, agricultural shows, sports, sheepdog trials etc.

Equine activities
Income from livery
Sports

Trading, Manufacturing and Rural Crafts(including production and/or retailing of goods, repair or restoration of machinery and other items, retailing of non-farm produce and gross profit on resale of purchase non-agricultural products)

Rural crafts
Trading

Services

Waste disposal
Miscellaneous services, e.g. metal detecting, roadside advertisements
Non-agricultural hire work

Other Miscellaneous receipts

3. QUALITY NOTE

This section provides a summary of information on these statistics against five dimensions of quality, based on the European Statistical System (ESS) quality framework: Relevance, Accuracy, Timeliness and Punctuality, Accessibility and Clarity, and Comparability. The Scottish Government adheres to the Code of Practice for Official Statistics and the National Statistician's guidance on quality. In addition the Scottish Government provides its own guidance on quality, which is available to view at the Scottish Government's Statistics internet pages.

Links to Guidance on Quality:

- Code of Practice for Official Statistics
<http://www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html>
- National Statistician's Guidance on Quality
<https://www.statisticsauthority.gov.uk/gsspolicy/national-statisticians-guidance-quality-methods-and-harmonisation/>
- Scottish Government's Corporate Policy Statement
<http://www.gov.scot/Topics/Statistics/About/QualityCPS/Q/EditMode/on/ForceUpdate/on>
- Scottish Government Guide to basic quality assurance
<http://www.gov.scot/Topics/Statistics/About/QAguide>
- European Statistics Code of Practice (including quality framework)
<http://ec.europa.eu/eurostat/web/quality/european-statistics-code-of-practice>

Data Providers

The Scottish Government relies on the data collected by the Scotland's Rural College (SRUC) to produce these statistics and therefore the quality of the SRUC data collection impacts significantly on Scottish Government analysis.

The quality of information collected from each farm is very high, based on fully reconciled farm accounts. Data for each farm is also validated against a comprehensive set of quality assurance checks. Some information on non-cash items, such as input of family labour, is estimated.

3.1 Relevance

The degree to which the statistical product meets user needs for both coverage and content.

Policy

The primary use of FBS data is to inform policy decisions and to help monitor and evaluate current policies, especially their impact on different agricultural sectors. The data is also used to model the impact of potential future policy options. Furthermore, FBS results also contribute to the compilation of Total Income from Farming (TIFF) estimates, especially as the source of input costs, which are forecast forward a year to account for the lag in survey results. The prominent profile of FBS in policy issues relates to the nature of the information collected and the scarcity of alternative sources.

EC requirements

The FBS data is also used to meet the EC requirements of the Farm Accountancy Data Network (FADN). The FADN is the only source of micro-economic data that is harmonised across all EC countries and is used for the formulation and evaluation of agricultural policy as well as in monitoring the farm income levels in each Member State. Further information on FADN and the results for all Member States are available on the following websites:

<http://ec.europa.eu/agriculture/rca/index.cfm>

http://ec.europa.eu/agriculture/analysis/fadn/index_en.htm

Farm business advice

The FBS provides information on average levels of return and costs faced by farmers. Corresponding information on top and bottom performers are used by farmers and farm advisors to evaluate the viability of businesses and business plans. The FBS also provides data for benchmarking business performance across the Scotland and the UK. Benchmarking data using farm accounts data is available at:

<https://www.fas.scot/publications/farm-performance-scotland-201516-whole-farm-benchmarks/>

<http://www.farmbusinesssurvey.co.uk/benchmarking/Default.aspx>

Research

Another important use of the survey is for academic research. The full dataset is made available in an anonymous form and under strict confidentiality conditions for a number of research projects.

A selection of research projects using FBS data are listed below (with links to final report where published):

- Revoredo-Giha, C., Barnes, A., Leat, P. and Walker, A. (2013). "[Scottish Dairy Sector Efficiency UK's Dairy Purchases Trends - A Contribution to the Scottish Dairy Sector Review](#)"
- Sheane, R., Lewis, K., Hall, P., Holmes-Ling, P., Kerr, A., Stewart, K., Webb, D. "[Identifying opportunities to reduce the carbon footprint associated with the Scottish dairy supply chain](#)"
- United Nations Environment Programme – World Conservation Monitoring Centre (UNEP-WCMC): National Ecosystem Assessment Project

User Feedback

The Scottish Government is always interested to hear from users about what is most relevant to them and welcomes feedback from users of these statistics. Contact details are available from the Agriculture Statistics contacts webpage, <http://www.scotland.gov.uk/Topics/Statistics/Browse/Agriculture-Fisheries/Contacts>.

Details of both current and past user consultations are available on the Agriculture Statistics consultations webpage, <http://www.scotland.gov.uk/Topics/Statistics/Browse/Agriculture-Fisheries/scotstat>.

3.2 Accuracy

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

When compiling these statistics, results are examined alongside previously published outputs and related evidence from alternative sources in order to ensure that the methods being used are producing reliable results and to aid the identification of potential outlying results that may impact on the analysis. Such outliers, when identified, may be excluded from specific analysis to ensure that the results are representative of the population being described. Outputs undergo quality assurance internally before being shared with data providers for quality assurance purposes.

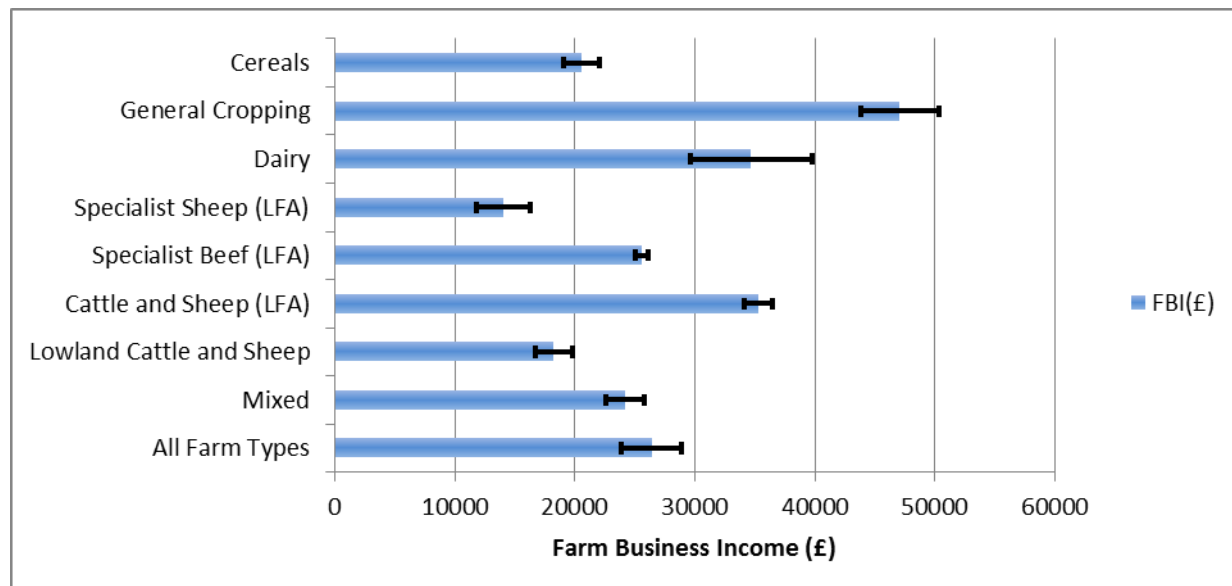
For 2016-17 results, 95% confidence intervals have been calculated for Farm Business Income (FBI). These intervals reflect the margin of error that is associated with the results, caused by the method of sampling within the survey.

The number of agricultural holdings surveyed in the farm accounts survey in 2016-17 was 490. This accounts for four per cent of the total relevant agricultural holdings in Scotland. As the survey does not cover the entire population, the FBI estimates are susceptible to sampling error.

The estimates for the mean FBI are calculated using weighted survey data. These figures are accompanied by 95% confidence intervals. The intervals tell us that we are 95% confident that the true value will lie within the given range. For example, we are 95% confident that the true mean FBI for dairy farms will lie within the range of £34,700 ± £5,100.

Figure 2 below, displays the FBI estimates across multiple farm types, with error bars indicating the confidence intervals.

Figure 2: 2016-17 Farm Business Income estimates



The sampling frame for the Farm Business Survey is the June Agricultural census. While, ideally, each strata in the survey would be proportionally representative of those farm types in the whole of Scotland, it is possible for the make up of the farming population to change from year to year and over longer periods of time. As farms can remain within the sample indefinitely the composition of the sample may not change in line with or at the same speed as the composition of the population of farms in Scotland. To account for this, a design effect for disproportionate sampling was introduced. The size of this design effect increases the further the strata is from being proportionally representative of that strata for the whole of Scotland. It is then applied into the calculation of our 95% confidence intervals. It should be noted that if the strata is already proportionally representative, the design effect will be equal to one, and no adjustments to the intervals will take place.

The size of the confidence intervals presented will vary depending on a number of factors, including: the sample size for the farm type, the standard errors associated, and the design effect. Generally, smaller sample sizes, larger standard errors, and larger design effects will result in wider intervals, while the opposite is associated with more narrow intervals.

Data collected through the FBS is of a highly sensitive nature; due to this the refusal rate of farms approached to participate is high. It is possible that non-responders (farms refusing to participate) may have different characteristics to responders (farms willing to cooperate), which could lead to biased results. Currently there has been no assessment of non-response bias in the FBS for Scotland.

The current weighting of FBS results is based on the inverse sampling fraction, that is the results for each stratum are multiplied by the factor necessary to represent all farms within the stratum in the overall population. Further (post-stratification) weighting may be used to compensate for non-response bias.

The quality of information collected from each farm is very high, based on fully reconciled farm accounts. Data for each farm is also validated against a comprehensive set of quality assurance checks. The potential for processing errors is regarded as low risk due to much of the collection being based on reconciled accounts, the extensive use of cross-checking validation routines and that the vast majority of farms have previous records in the survey which can also be used to identify inaccuracies in returns. In some cases, accounts may not be finalised until after the deadline for submission of data. In such cases estimated records are updated and the published figures are revised in the following year. In this sense, the first release of data for a particular year may be regarded as provisional.

3.3 Timeliness and Punctuality

Timeliness refers to the lapse of time between publication and the period to which the data refer.

The survey is not carried out on a calendar-year basis but based on farms' financial years. The exact period covered by the survey, for any given year, will vary across the sample depending on individual businesses' accounting year ends, although they all centre on the same cropping period. For example, the 2016-17 accounts, first published in March 2018, all centre on the 2016 production and subsidy year. The spread of closing valuation dates from the autumn of one year to the spring of the next, which means that some of the 2016-17 accounts relate to the 2016 winter whilst others relate to that of 2017.

Punctuality refers to the time lag between the actual and planned dates of publication.

Headline FBI estimates for 2016-17 were first published in the 'Scottish Farm Income Estimates 2016-17' National Statistics publication, released on the 8th March 2018 at the following internet address, <http://www.gov.scot/stats/bulletins/01307>

Detailed analysis of farm income estimates was published in the National Statistics publication 'Economic Report on Scottish Agriculture' Edition, which are released in June each year at the following internet address, <http://www.gov.scot/Topics/Statistics/Browse/Agriculture-Fisheries/PubEconomicReport>

3.4 Accessibility and Clarity

Accessibility is the ease with which users are able to access the data. It also relates to 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.

These statistics are made available online at the Scottish Government's statistics website in accessible formats (html and pdf versions are available). All data tables are made available in excel format to allow users to carry out further analysis. Methodological notes and additional notes to tables, identifying specific quality issues, are included in this document, which is available online and linked to from all National Statistics outputs containing results from the FBS. Links to the Agriculture Statistics series of outputs are available at the following internet address, <http://www.gov.scot/Topics/Statistics/Browse/Agriculture-Fisheries/Publications>.

3.5 Comparability

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

Trends for most farm types are subject to annual sample variations, as a small number of farms join and leave the survey each year. Between 2015-16 and 2016-17, 31 farms left and 20 new farms entered the survey. In addition, the characteristics of farms which remain within the sample can change between sample years, e.g. a mixed farm type may increase investment in livestock; such a change in the characteristics of the farm may result in a change to the classification of the farm type, e.g. to cattle and sheep rather than mixed.

Table 3 below provides the number of farms in the sample, by farm type, from 2011-12 to 2016-17.

Table 3: Number of farms in FBS from 2011-12 to 2016-17

Type of Farms	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Specialist Sheep (LFA)	40	42	41	47	48	48
Specialist Cattle (LFA)	136	135	134	122	124	124
Cattle and Sheep (LFA)	58	54	57	63	63	62
Cereals	55	58	66	63	70	58
General Cropping	63	60	55	53	45	53
Dairy	54	51	45	46	53	44
Lowland Cattle and Sheep	29	29	27	30	28	29
Mixed	75	73	71	78	77	72
All Farm Types	510	502	496	502	508	490

Although the quality of information for each farm business in the survey is considered to be high, these relatively low sample sizes do mean that the results are subject to a degree of uncertainty in terms of representing overall national averages by farm type.

The balance of movement out of, and into the sample, may result in changes to average FBI values compared to what could have been expected if the composition of the sample had not changed over the last year. Replacement farms entering the survey are selected according to farm type and size to try to achieve and maintain a sample representative of Scottish farms.

The majority of information collected from the FBS is required to meet the EC requirements of the Farm Accountancy Data Network (FADN). The FADN is the only source of micro-economic data that is harmonised across all EC countries. As such, similar analysis of farm income estimates is available both for UK countries and member states of the EC. Some differences do exist between countries, for example the basis of valuations and depreciation of assets. Details of the methodologies of data relating to other countries (within or outwith the UK) should be sought from the respective government department.

The EC regularly produces results of the FADN data collections, providing overall and county specific results and these are made available online. Further information on FADN and the results for all Member States are available on the following websites:

<http://ec.europa.eu/agriculture/rica/index.cfm>

http://ec.europa.eu/agriculture/analysis/fadn/index_en.htm

Typically EC results are published later than Scottish or UK results due to the additional time required to collate, validate and analyse data from several countries.

The Department for Environment, Food and Rural Affairs (DEFRA) in England, the Welsh Assembly Government (WAG) in Wales and the Department of Agriculture and Rural Development (DARD) in Northern Ireland routinely publish results from their equivalent survey - the Farm Business Survey - these can be accessed from the websites below,

England (DEFRA)

<http://www.defra.gov.uk/statistics/foodfarm/farmmanage/fbs/>

Wales (produced by IBERS on behalf of WAG)

<https://www.aber.ac.uk/en/ibers/research-and-enterprise//fbs/>

Northern Ireland (DAERA)

<https://www.daera-ni.gov.uk/articles/farm-incomes-northern-ireland>

3.6 Respondent Burden

The Respondent burden is often defined as the effort required to complete the survey. Current estimates suggest a respondent will spend approximately 2.5 hours completing the farm business survey, or gathering the required information.

4. USEFUL INTERNET LINKS

The Scottish Government statistics page

<http://www.gov.scot/Topics/Statistics>

The Scottish Government Agriculture Statistics page

<http://www.gov.scot/Topics/Statistics/Browse/Agriculture-Fisheries>

The Scottish Government Agriculture statistics publications page

<http://www.gov.scot/Topics/Statistics/Browse/Agriculture-Fisheries/Publications>

The European Commission Farm Accountancy Data Network homepage

<http://ec.europa.eu/agriculture/rica/index.cfm>

The Scottish Agricultural College homepage

https://www.sruc.ac.uk/info/20005/sac_consulting

The Department for Environment, Food and Rural Affairs statistics page

www.defra.gov.uk/statistics

The Welsh Assembly Government statistics page (English language version)

<http://gov.wales/statistics-and-research/?lang=en>

The Department for Agriculture and Rural Development, Northern Ireland homepage

www.dardni.gov.uk/index.htm

The UK Statistics Authority homepage

www.statisticsauthority.gov.uk

The Code of Practice for Official Statistics (UKSA page)

<https://www.statisticsauthority.gov.uk/code-of-practice/>

European Statistics Code of Practice (including quality framework)

<http://ec.europa.eu/eurostat/web/quality/european-statistics-code-of-practice>