

**Methodology for the  
Annual Aggregate Agricultural Account  
in Scotland**  
(also known as Total Income from Farming)

**Updated for January 2017**

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## CHAPTER 1 - GENERAL FRAMEWORK

### 1.1 Institutional framework

In Scotland the Scottish Government Rural & Environment Science & Analytical Services (RESAS) has responsibility for agricultural statistics.

RESAS produces its own aggregate agricultural account annually. The account is published in the Scottish Agriculture Output, Input and Income Statistics.

#### 1.1.1 Legal basis for production of account

The Agriculture Act 1993, Part IV Miscellaneous and Supplementary, sets out the requirement for an annual report on agricultural matters relevant to price support for agricultural produce and appropriate developments in agricultural policy. The Scotland agricultural account contributes towards this annual report.

The relevant extract of the Act (unamended) is below.

Annual report on matters relevant to price support.

**58.—**(1) The Ministers shall publish an annual report on such matters relevant to price support for agricultural produce as they consider appropriate and include in the report such account as they consider appropriate of developments in agricultural policy, so far as relevant to such matters.

(2) In subsection (1) above, the reference to agricultural policy includes policy relating to agriculture and the environment.

(3) In this section—

"agriculture" and "agricultural" shall be construed in accordance with section 109(3) of the [1947 c. 48.] Agriculture Act 1947; and

"the Ministers" means the Minister of Agriculture, Fisheries and Food and the Secretaries of State concerned with agriculture in Scotland, Wales and Northern Ireland acting jointly.

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### **1.1.2 Explanation of revisions policy**

There are three types of revisions.

The account for a given year, published in January of the following year, is prepared using actual data where available, and otherwise forecasts to the end of the year. A number of data sources use annual surveys whose results only become available at the end of each calendar year. In some cases, as results span a harvest or financial year rather than a calendar year, a third publication year is required before final data are available. Therefore, each publication will, as standard, have “first provision” results for the latest year, revised “second provisional” results for the previous year, and potentially further revised “final results” for the year prior to that.

Any methodological changes adopted are applied to historical years, back as far as deemed necessary, at the time of publication. No further revisions are made until the next account is prepared.

Any errors in the account calculations will normally be corrected at the time of the next account being published, unless the error is considered large enough to warrant a more immediate correction.

### **1.1.3 Explanation of results dissemination**

RESAS publishes statistical reports and economic information on agriculture and fisheries, including results from the main agricultural census and surveys, information on farming incomes and the annual report of sea fisheries statistics.

The first release of aggregate Total Income From Farming (TIFF) estimates, along with revisions to previous years, are published each January. The Economic Report on Scottish Agriculture publication containing Total Income From Farming estimates, Farm Accounts Survey results, and Agricultural Census statistics and is published annually in June.

All agriculture publications can be accessed through the following link.

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

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## CHAPTER 2 –OUTPUT OF CROPS

### 2.1 Cereals

**Items included in bill:** Wheat, Barley, Oats, Triticale and Mixed Grain.

#### 2.1.1 Quantities

The quantity is calculated as

$$\begin{array}{l} \text{total area (June Agricultural Census)} \\ \times \text{ average yield (annual Cereal Stocks Survey)}. \end{array}$$

Cereal yield is derived from our annual cereal stocks survey. The sample for this survey is taken from those respondents who indicated an area of cereals in their June agriculture census return. The sample is stratified by region (SE, SW, NE, and NW) and crop group (main crop area of farm with information collected on other crops grown). From the survey we obtain yields for each stratum and apply these to the total area in each stratum (given by the June Agricultural Census). We ask farmers to provide estimates of production of cereals to enable us to calculate yields. We also ask the farmers how they dispose of their stock (Barley, Wheat and Oats only) i.e. to merchants or farmers outside Scotland, to Scottish farmers, used for feed, used for seed or waste etc. We continue to survey the farmers every month from October to June within a year, or until they dispose of all their stock.

The yield for Mixed Grain is taken to be the Spring Barley yield. This yield is multiplied by the area of mixed grain from the June Agricultural Census to arrive at a production figure.

#### 2.1.2 Prices

Value of production for Wheat, Barley and Oats is broken down into that of cereals sold off the national farm<sup>1</sup> and that used on the national farm.

##### Sold off the national farm

The Home Grown Cereals Authority (HGCA) supply Wheat, Barley and Oats prices (£/tonne) for cereals sold off the national farm for milling, seed and feed.

The amount of cereal sold off the national farm is taken to be the figure for disposals to merchants or farmers outside Scotland, from the Cereal Stocks Survey (Disposals). This figure is further broken down into tonnage sold for milling etc, seed, and feed & other, in order to weight the different prices to create an overall average.

- The tonnage figure for cereals sold for milling/distilling is provided by industry contacts.

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<sup>1</sup> The term national farm means that we combine all Scottish farms together to infer one aggregated farm for Scotland.

- The tonnage figure for cereals sold for seed is derived from the certified seed area obtained from the Scottish Agricultural Science Agency (SASA) and the yield from the production survey.
- The tonnage figure for cereals sold for feed is what is left over from deducting the tonnage sold for milling and tonnage sold for seed away from the tonnage sold to merchants or farmers outside Scotland.

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### Used on the national farm

The amount of cereal used on the national farm is taken from the Cereal Stocks Survey (Disposals) as that sold to Scottish farmers, used for feed, used for seed and waste etc. We apply the HGCA supplied price (£/tonne) for feed sold off the national farm to the tonnage sold to Scottish farmers and waste.

A £/tonne figure for Scottish grown Triticale is estimated relative to the feed Wheat price from HGCA; this price is also used for Mixed Grain.

#### **2.1.3 Value of output**

Value of output = (Tonnage x Price) + Subsidy. For Barley, Wheat and Oats a stock change is also applied, using an average annual price for each crop.

There are currently no subsidies directly relating to cereal production.

## **2.2 Oilseeds and oleaginous fruits**

### **2.2.1 Oilseed Rape and Linseed**

#### **2.2.1.1 Quantities**

The quantity is calculated as

$$\begin{array}{l} \text{total area (June Agricultural Census)} \\ \times \text{ average yield (annual Cereal Stocks Survey)}. \end{array}$$

Production of oilseed is derived from our annual cereal stocks survey. We obtain an oilseed yield from the survey, which is applied to the oilseed rape (rotational) area from the June agricultural census.

#### **2.2.1.2 Prices**

Prices (£/tonne) for oilseed rape (rotational and set-aside) are sourced from published records of Farmer's Weekly.

#### **2.2.1.3 Value of output**

Value of output = (Tonnage x Price) + Subsidy

There are currently no subsidies directly relating to cereal production.

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## 2.3 Protein Crops

### 2.3.1 Quantities

The quantity is calculated as

$$\begin{aligned} & \text{total area (June Agricultural Census)} \\ \times & \text{ average yield (based on industry estimates).} \end{aligned}$$

### 2.3.2 Prices

Prices (£/tonne) for peas and beans are provided by an industry contact.

### 2.3.3 Value of output

Value of output = (Tonnage x Price) + Subsidy

There are currently no subsidies directly relating to cereal production.

## 2.4 Sugar Beet

*Not Calculated in Scotland.*

## 2.5 Other industrial crops

### 2.5.1 Flax

*Not Calculated in Scotland.*

### 2.5.2 Hemp

*Not Calculated in Scotland.*

### 2.5.3 Unspecified crops

Unspecified crops cover flax, grass seed, lawn turf and others. Calculations for all items except others have been explained previously.

#### 2.5.3.1 Quantities

To calculate the other unspecified crops area (hectares) we take the unspecified crops area from the census and take off the areas for flax, grass seed and lawn turf.

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Other unspecified crops area = unspecified crops area – grass seed area – lawn turf area.

We take the mixed grain yield (tonnes/ha) as the other unspecified crops yield. Note the mixed grain yield is taken from the barley yield.

### **2.5.3.2 Prices**

We take the mixed grain price (£/tonne) as the other unspecified crops price. Note the mixed grain price is taken from the triticale price.

### **2.5.3.3 Value of output**

Value of output = Tonnage x Price (£/tonne)

## **2.5.4 Lawn turf**

### **2.5.4.1 Quantities**

The area of lawn turf comes from the Agricultural Census. The area is equivalent to the quantity here.

### **2.5.4.2 Prices**

A price (£/hectare) for lawn turf has been kept constant since the introduction of the item in 1989. The original estimated price (£/hectare) was provided by an industry contact.

### **2.5.4.3 Value of output**

Value of output = Tonnage x Price (£/tonne)

## **2.5.5 Mustard**

*Not Calculated in Scotland.*

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## **2.5.6 Grass seed**

### **2.5.6.1 Quantities**

Grass seed area (hectares) and yield (tonnes/ha) are obtained from the SASA. Volume of grass seed production (tonnes) = Grass seed area x Grass seed yield

### **2.5.6.2 Prices**

A price (£/tonne) for grass seed is obtained from SASA.

### **2.5.6.3 Value of output**

Value of output = (Tonnage x Price) + Subsidy

Grass seed subsidy figures are provided by RESAS's CAP Management Division.

## **2.6 Forage crops (Hay, Straw etc)**

### **2.6.1 Quantities**

Hay, straw and silage output (tonnes) is taken from the December census.

### **2.6.2 Prices**

Hay and straw (prices are sourced from merchants).

### **2.6.3 Value of output**

The value is calculated as production quantity multiplied by the annual price.

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## 2.7 Fresh vegetables

**Items included in bill:** Leeks, Carrots, Turnips & Swedes<sup>2</sup>, Cabbage Spring, Cabbage Summer & Autumn, Cabbage Winter, Cauliflower, Broccoli, Brussels Sprouts, Beans, Peas, Lettuce, Rhubarb, Others (in the Open), Mixed (in the Open), Tomatoes and Mushrooms.

### 2.7.1 Quantities

The quantity is calculated as

$$\text{total area (June Agricultural Census)} \\ \times \text{average yield (various).}$$

Yields for leeks, cabbage, lettuce and rhubarb are obtained from DEFRA's British Horticultural Survey.

Yields for Carrots, Turnips & Swedes, Cauliflower, Broccoli, Sprouts, Peas and Beans are taken from Surveys carried out by the Scottish Rural College (SRuC).

Early yields for the year are available but maincrop yields will not be available until the following year.

Others (in the Open) and Mixed (in the Open) yields are the average of all other vegetable yields (excluding tomato and mushroom yields).

Tomato yield is estimated using index data from DEFRA's British Horticulture Survey.

Mushroom yields have been kept constant since the last mushroom survey in 1996. We are investigating sourcing other information.

### 2.7.2 Prices

Prices per tonne are calculated using the previous year's data (and hence originally survey data) scaled-up by the increased the Glasgow Fruit Market prices.

Others (in the Open) and Mixed (in the Open) prices per tonne are the average of all other vegetable prices per tonne (excluding tomato and mushroom prices).

### 2.7.3 Value of Output

Total output value = Sum of all the listed vegetables output values.

Vegetable output value=Vegetable output (tonnes)\*Vegetable price/tonne

### 2.7.4 Forecasts

For forecast yields we use the change in yields from the Cereal Stocks Survey.

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<sup>2</sup> We produce an estimate for Turnips and Swedes collectively but Scottish production is predominantly Swedes.

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## 2.8 Plants and Flowers

**Items included in bill:** Flowers, Bulbs, Fruit Stocks, Roses, Ornamentals, Other HNS, Protected Crops.

### 2.8.1 Quantities and Prices

Output (£) = Area (from June Census) \* Output/ha

A GDP inflator has been applied to the last available value for Output/ha, in 2002. An alternative source of data is being sought.

### 2.8.2 Value of Output

Total output value = Sum of all the listed items output values.

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## 2.9 Potatoes

**Items included in bill:** Early Potatoes, Seed Potatoes (home trade, exports and on farm retentions), Ware Potatoes (recorded merchants, unrecorded (retail), unrecorded (other)), Waste Potatoes (stock-feed, other) and stock-change.

We calculate the value of output for the crop year, split by when it was sold. Hence for a given calendar year we use any potatoes sold during the year, whether they be grown that calendar year or in the previous year's crop.

### 2.9.1 Quantities

Early Harvested Production (tonnes) was previously provided by the British Potato Council (BPC). Since these data are no longer available, an estimate is made based on the GB figure.

SASA provide the total area of seed potato production, with AHDB providing the total yield per hectare. It is assumed that 68 per cent of this yield is used as seed, the rest as "tops" in the ware production. From this a quantity, estimated in the seed bill, is used on farm. Of the rest, 35 per cent are assumed to be sold in the same calendar year and the remainder the following year.

AHDB provide the total tonnage of ware potatoes produced. For the latest year (which is not available in time), the previous year's data is scaled up using census

data. 13.2 per cent of ware are assumed to be waste, but the “tops” from seed potato production are also added. Assumed amounts (26 per cent for tops and 45 per cent ware) are sold in year one, the remainder the following year.

Of the waste, an assumed 60 per cent is used as stock-feed, with 35 per cent used in year one and remainder the following calendar year.

Stock change

### **2.9.2 Prices**

British Potato Council (BPC) provide us with the price per tonne for early potatoes.

Seed Prices come from our own sample survey of SASA-registered seed potato producers. This provide us with the price per tonne and quantities sold for various varieties, which we weight by the totals produced according to SASA register.

Ware prices come from the AHDB Combined free-buy and contract average price.

For waste potatoes, stock-feed prices are taken from the John Nix Pocketbook and other waste have no value.

### **2.9.3 Stock change**

Stock change is calculated for seed, ware and stock-feed, using the amounts calculated as being carried over to the next year.

### **2.9.4 Value of output**

Total output value = Sum of all potato types.

Potato output value=Potato output (tonnes)\*Potato price/tonne

Account Potato Output Value = Potato output value + Value of Stock Change

### **2.9.5 Forecasts**

For forecasts we use any industry intelligence available.

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## **2.10 Fruits**

Items included in bill: Raspberries, Strawberries, Blackberries, Mixed/Other Soft Fruit and Orchard.

### **2.10.1 Quantities**

Tonnes = Area (from June Census) \* Yield

Yields for Raspberries, Strawberries and Blackcurrants are derived from a postal survey of horticultural units, previously carried out by the Horticulture Marketing Unit. Mixed Fruit yield is given by the sum of the Raspberry, Strawberry and Blackcurrant production. Orchard yields are from the British Horticulture Survey.

### **2.10.2 Prices**

Prices per tonne for Raspberries and Strawberries are obtained from the postal survey. Blackcurrants prices are calculated as increasing at the same rate as strawberries and raspberries. Mixed Fruit is calculated as the average of strawberries, raspberries and blackcurrants, and orchard price per tonne is obtained from the British Horticulture Survey.

### **2.10.3 Value of Output**

Fruit output value=Fruit output (tonnes)\*Fruit price/tonne

### **2.10.4 Forecasts**

Yield results for the year are not available until the following year, thus we estimate the percentage change in yield using that from the cereal survey. Orchard prices are forecast using increase in other fruit prices.

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## **2.11 Wine**

*Not Calculated in Scotland.*

## **2.12 Other Crop Products**

Honey is considered in other animal products.

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## CHAPTER 3 –OUTPUT OF ANIMAL PRODUCTS

### 3.1 Cattle

Cattle Types - Finished and Store Cattle and Calves

#### 3.1.1 Quantities

Finished Cattle and Calf numbers and average weights are obtained every month from Slaughter Survey.

Cattle Tracing System (CTS) data are used to calculate store animals numbers.

#### 3.1.2 Prices

Prices for finished animals taken from Agriculture and Horticulture Development Board (AHDB) deadweight prices per kg survey.

Prices for store animals taken from AHDB Weekly Auction Market Reports of Store Auction Prices.

#### 3.1.3 Value of output

Value for finished cattle is calculated firstly by splitting into Steers, Heifers, Young Bulls and calves then for each category the number of animals slaughtered is multiplied by average weight which is then multiplied average price per kg.

#### 3.1.4 Expenses

Expenses are estimated for clean for MLC levies (rate per head), insurance (rate per head), transport (rate per head for an assumed 58 per cent of head), auction (four per cent of value, assuming ten per cent are auctioned).

For cull expenses are for MLC levies (rate per head), transport (rate per head for an assumed 60 per cent of head).

For calves expenses are for MLC levies (rate per head), insurance (rate per head), auction (four per cent of value, assuming 70 per cent are auctioned)

For export calves, the only expenses are auction (four per cent of value, assuming 80 per cent are auctioned).

For store expenses are for transport (where net exports are positive, a rate applied to an assumed 85.7 per cent of net exports) and auction (four per cent of value).

#### 3.1.5 Stock change

Value for stock is calculated using numbers derived from CTS data and end of year prices from AHDB market reports.

The year-on-year change in volume of stocks is calculated from the difference between quantity estimates at the end of the current year and the previous year. For the purposes of calculating final volumes, the livestock numbers derived from CTS data are converted into dressed carcass weight for the year to produce the final volume figure. Cattle in the breeding herd are not included in the stock change calculation.

### **3.1.6 Subsidies**

Subsidies associated with production are added to the output value, from 2009 onwards this includes only the Scottish Beef Calf Scheme.

## **3.2 Pigs**

Pig Types - Clean Pigs, Sows and Boars

### **3.2.1 Quantities**

The total marketings number is modelled using the following methodology. The average sow breeding population (over two December and one June surveys), multiplied by production per sow (data from DEFRA) gives the piglet production. The number of these moved to other parts of UK is kept at a constant 20,000, information obtained originally from Scottish Pig Producers and Scotlean Pigs. Of the remainder most will be slaughtered (clean) but a proportion are kept to replace culled breeding stock (at an assumed rate of about 50 per cent of sows each year, data from SRuC and DEFRA). We also take into account changes in the population size. So if there has been an increase in the population it is assumed that fewer sows were culled and fewer piglets were slaughtered. If there has been a decrease in the population it is assumed that fewer piglets were used as replacements.

### **3.2.2 Prices**

Monthly deadweight pig prices per kg from AHDB for Clean Pigs, Sows and Boars.

### **3.2.3 Value of output**

Monthly slaughter numbers multiplied by average slaughter weights which is in turn multiplied by monthly average prices for pig category.

### **3.2.4 Expenses**

Expenses are calculated as £1 per head MLC levy, four per cent of value for auctions for one per cent of clean and four per cent of cull, and a per head value for transport based on 23 per cent of clean and 21 per cent of cull.

### **3.2.5 Stock change**

Value for stock is calculated using census numbers and end of year prices from AHDB market reports. Pigs used for breeding are not included in the stock change calculation.

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### 3.3 Equines

An estimate for horses is covered in Other Animals, see (3.6).

### 3.4 Sheep and goats

Sheep Types - Clean Sheep, Ewes and Rams, Store Sheep

#### 3.4.1 Quantities

The output of animals is calculated by modelling numbers, based on lamb numbers at the June and December censuses. Assumptions are also made about the number of new lambs slaughtered before the June, the number exported as store, and mortality. Some are sold liveweight, some deadweight. A similar model is used for ewes and rams output. The Scottish cull figure is much lower than modelled, so the rest are assumed to be exported, 40 per cent for store and the rest for slaughter.

Average weights for Clean Sheep and Ewes and Rams are taken from slaughter survey, with autumn markets data used for store weights.

#### 3.4.2 Prices

Prices for finished animals taken from AHDB deadweight prices per kg survey.

Prices for store animals taken from AHDB Weekly Auction Market Reports and Autumn Market reports of Store Auction Prices.

#### 3.4.3 Value of output

Value is calculated using numbers from the model, average weights from slaughter survey and prices from AHDB;

#### 3.2.4 Expenses

Expenses are calculated as four per cent of value for auctions for 95 per cent of ewes and about two-thirds of lambs, a per head value for transport based on 67.8 per cent of the two-thirds of lambs and 69.5 per cent of the 95 per cent of cull, and a fatstock charge of £0.35 per head on deadweight. However a levy figure of £0.60 is also paid (not charged) per head deadweight. For store export a per head figure is paid for 85.4 per cent, and four per cent auction.

#### 3.2.5 Stock change

Value for stock is calculated using census numbers and end of year prices from AHDB market reports. Sheep used for breeding are not included in the stock change calculation.

#### 3.2.6 Goats

No estimation is currently made for goats.

## 3.5 Poultry

Poultry Types - Broilers, Spent Hens, Other poultry.

### 3.5.1 Quantities

Slaughter numbers are modelled based on a multiple of the average December and June census figures for broilers. Average weights are estimated based on industry data.

Breeding and layer hen numbers are modelled, using the following methodology. Layer hens are assumed to stay in the flock for 14 months, so hens in the early December census will, approximately, be those that die the following year (on average 12/14 of them will die in the year). For breeders the fraction is 12/13 for an assume 13 month lifespan.

The assumed seven per cent mortality is applied, though on average a hen is half way through its life at the time of the census, so the remaining mortality is halved. The rest will be slaughtered during the year. Mortality numbers are equal to the 3.5 per cent remaining mortality of the Dec census hens, plus the equivalent 3.5 per cent mortality of new hens prior to next December census.

Entries are calculated as

- end year population
- start year population (i.e. previous December)
- + slaughterings
- + mortality

For layer hens, an additional second cycle model is produced for moulted hens, the proportion of end-of-first cycle hens that are not slaughtered but allowed to moult and then start laying again. It uses the same methodology, but based on the June and December 2<sup>nd</sup> cycle figures and a seven-month production period. The December population will die during the first half of the year, and the June population will die during the second half of a year (or 6/7 of the population will). Similar methodologies to the above, but on half-year data, are used for mortality and entry data. Total slaughterings are therefore

- first cycle potential slaughterings
- second cycle entries
- + second cycle slaughterings

Slaughter data for other poultry is assumed to be one per cent of the broiler and hen numbers.

### 3.5.2 Prices

Average broiler and spent hen prices are estimated using industry data. UK figures are used for pullet prices.

### 3.5.3 Stock change

Stock change numbers for broilers are taken from December survey data and are multiplied by average price.

## 3.6 Other animals

Rabbits, game, horses for riding schools, stud farms, knacker animals, dogs, weaned pigs (store), deer, store poultry, hatching eggs, and farmed venison. No estimation is currently made for camelids.

Values for rabbits and game are kept constant.

Values for horses and dogs are calculated as a percentage of a DEFRA UK total.

The number of store pigs is taken as an assumption from the pig model, with a price applied from survey data.

Data for store poultry (chicks) and hatching egg exports are calculated from hatchery data and breeder numbers.

An historical estimate for the value of venison meat is adjusted using a price inflator and deer numbers.

## 3.7 Milk

Includes values for milk and milk products (butter, yoghurt, cheese, etc).

### 3.7.1 Quantities

Quantities until 2014 were taken from the monitoring of milk quotas, but for 2015 onwards were taken from survey data, including DEFRA data English dairies purchasing Scottish milk.

### 3.7.2 Prices

Average monthly prices taken from Milk Survey. As of 2014 all milk producers in Scotland are included in the survey. The survey collects information on prices and quantities of milk bought from Scottish and other parts of UK. Separate calculations are made for direct sales of milk and milk products.

### 3.7.3 Value of output

Value is calculated on monthly basis using amount of milk purchased from Scottish Farms and the average monthly price.

## 3.8 Eggs

Separate values are calculated for laying cages, free range, barn/perchery, and organic.

### 3.8.1 Quantities

The quantity is calculated as

$$\begin{aligned} & \text{laying hens (June and December Agricultural Census)} \\ & \times \text{average yield (SRuC data).} \end{aligned}$$

The total output is calculated from first and second cycle figures from the June and December censuses. Weighted averages are taken from the June and the previous and the following Decembers. DEFRA figures give the percentage split for each production sector.

### 3.8.2 Prices

Basic prices for Scottish eggs are provided by DEFRA. BFREPA data on prices by production sector are used to mark-up for organic, barn and free-range.

### 3.8.3 Value of output

Eggs are valued by multiplying monthly quantities of eggs by monthly egg prices with an additional 0.5 per cent added for direct sales.

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## 3.9 Other animal products

Wool, honey, goats milk

### 3.9.1 Wool

Wool quantities and weights are obtained from the British Wool Marketing Board (BWMB), split by Shetland or other.

Wool prices and charges obtained from BWMB.

### 3.9.2 Other animal products

Values for goats milk are calculated as a percentage of a DEFRA UK total.

Values for other poultry eggs are kept constant.

Value for honey comes from BeeCraft figures.

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## CHAPTER 4 – AGRICULTURAL SERVICES AND NON-AGRICULTURAL SECONDARY ACTIVITIES

### 4.1 Agricultural Services Output

The following methodology is that used in several elements of TIFF calculations (mainly various costs, but also income from contract and non-agricultural activities), which in the following pages will refer back to this description.

Values are taken for the average costs per farm for a FAS<sup>3</sup> farm, for each farm-type included in FAS (Cereals, General Cropping, Dairying, Specialist Sheep (LFA), Specialist Beef (LFA), Beef and Sheep (LFA), Lowland Beef and Sheep and Mixed). These are scaled-up from an average farm to the total for the farm-type, using Standard Outputs (SOs)<sup>4</sup> as a measure of the economic size of a sector, by multiplying by the ratio

$$\frac{\text{total SO for the farm-type in Scotland}}{\text{average SO in FAS for farm-type}}$$

The accounting-year basis of FAS data is then converted into calendar years, based on 1/4 of the previous FAS account year + 3/4 of the current/forecast FAS account year. These farm-type totals are then summed to create a national estimate.

The methodology is complicated by the fact that some farm-types are excluded from FAS. Average cost rates are therefore used for Specialist Pigs, Specialist Poultry, Horticulture and Forage farms, as described below. In 2013 it is also complicated by the need to change from using Standard Gross Margins (SGMs) to SOs.

The change from SGMs to SOs only has a substantive effect on the calculations in respect to non-FAS farm-types, where the proportional increase from SGM-sized numbers to SO-sized numbers is not reflected equally in both the numerator and denominator of the multiplication factor, if we use, as we have in the past,

$$\frac{\text{total SGM/SO for non-FAS farm-type in Scotland}}{\text{overall average FAS farm-type SGM/SO}} \times \text{overall average FAS farm costs}$$

In particular, the introduction of value to forage creates ungrounded large increases in estimated costs, due to a large magnitude increase in total SO for forage farm-types (the numerator) but with only an average-magnitude increase in the average FAS farm (the denominator).

For 2013-14 onwards, the costs for non-FAS farm-types, and the transition from SGMs to SOs are produced by

i. calculating the factor by which total FAS farm-type costs were increased in the previous year's calculations to account for non-FAS farm-types.

<sup>3</sup> Farm Accounts Survey – see annex

<sup>4</sup> prior to 2013-14, Standard Gross Margins were used

- ii. adjusting this factor to account for any change in the relative size of non-FAS farm-types compared to FAS farm-types, based on year-on-year changes in total SOs for FAS and non-FAS farm types.
- iii. applying that adjusted factor to the 2013-14 FAS farm-type costs to account for the non-FAS farm-types.

The latest published TIFF year always contains a combination of the latest available FAS year and an as yet unavailable FAS year. For example, the 2013 TIFF estimates are a combination of 1/4 of 2012-13 and 3/4 of 2013-14. Since 2013-14 data are not available estimates need to be calculated for the percentage year-on-year increase. This is generally done by multiplying a percentage change in volume by the percentage change in price.

#### **4.1.1 Agricultural Services**

Agricultural Services = Total Contract Work Income, less ten per cent estimates to be non-agricultural work

Contract work combines data from the Farm Accounts Survey (FAS) for crop contract work costs, other contract work costs, and leasing charges.

Latest year estimates for contract work use changes in crop areas and livestock numbers, and price indices for machinery usage.

#### **4.1.2 Leasing of quota**

*None in Scotland*

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### **4.2 Non-Agricultural Secondary activities (inseparable)**

To estimate the value of non-agricultural activities we use data from the Farm Accounts Survey. Specifically we obtain the average values for

- miscellaneous revenue (crop damage compensation, net revenue from sale of purchased standing crop, rent for cattle courts, rent for crop storage, interest from delayed receipts, insurance claims on fodder crops (net of replacement costs), sales of surplus semen)
- miscellaneous woodland receipts (sale of immature trees and thinnings from farmed woodland)
- ownership income (quarry rents, timber sales from non-farmed land, income from cottage lets (off-farm))
- non-farm income, (income from camping, caravans etc.) though not diversified activities such as wind-farms
- other sundry receipts (way leaves, co-op trading bonuses, scrap materials (not machinery), government training scheme payments, camping, caravans revenue not included in non-farm income)
- an estimate for non-agricultural contract work

and apply the methodology set out in 4.1 above.

Various relevant price DEFRA indices are used to forecast latest year, until FAS data become available.

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## **CHAPTER 5 – SUBSIDIES AND TAXES**

The Scottish Ministers are responsible for all EU CAP (Common Agricultural Policy) schemes in Scotland. RESAS's CAP division administers most of the direct subsidy schemes.

The European Commission (EC) appointed RESAS to be the Paying Agency in Scotland for all EU CAP schemes. RESAS are responsible for administering direct payment schemes to Scottish farmers. The EU European Agricultural Guarantee and Guidance Fund (EAGGF) wholly or partly fund all the schemes.

Rural Payment Agency (RPA) also administers certain schemes on behalf of the Scottish Ministers, through an Agency agreement. The schemes include milk quotas, the Over Thirty-Month Scheme, administration of external trade schemes, intervention buying and selling.

Data for the various EC and Scottish Government support schemes, included in Total income from farming (not all are), are provided by the appropriate divisions within the Scottish Government.

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## CHAPTER 6 – INTERMEDIATE CONSUMPTION

### 6.1 Seeds And Planting Stock

Seeds included in bill: Wheat, Barley, Oats, All other cereals, Protein crops, Oilseed rape, Linseed, Other fodder, Vegetables, Soft Fruit, Protected Crops, Hardy Nursery Stock, Unspecified crops.

In general areas are taken from June census, and seeding rates and costs sourced from SRuC Handbook.

$$\text{Seed Input Value} = \text{Area} \times \text{Seeding Rate} \times \text{Cost}$$

#### 6.1.1 Cereals and Protein Crops

For Wheat, Barley and Oats the total seed quantity are split into purchased and home-saved. The home-saved quantities come from the respective cereal output bills and the purchased is the residual. Prices for purchased seed come from the SAC Handbook and home-saved prices come from the output bills.

#### 6.1.2 Oilseed, Grass and Other Fodder

Area of grass reseeded is taken to be 20% of following years' grass under 5 years area. Reseeding charge is annual charge multiplied by life cycle.

#### 6.1.3 Fruits

Area planted = Census Area \* life cycle  
Life cycle estimates and costs from SAC Handbook.

#### 6.1.4 Hardy Nursery Stock

Seed input value is estimated as a percentage of the output value.

|                     |             |
|---------------------|-------------|
| Protected Crops     | 10 per cent |
| Flower Bulbs        | 40 per cent |
| Flowers             | 10 per cent |
| Hardy Nursery Stock | 10 per cent |

#### 6.1.5 Potato

Total Area Planted = Total Census Area – one per cent for headlands.

BPC give total plantings by variety. BPC variety areas are raised to total planted area, as calculated above. SASA give seed potato planting by variety thus we can derive the ware planted area by variety. Seeding rates for seed and ware areas for all varieties are sourced from the SRuC management handbook and BPC. Multiply seeding rates by the areas gives us total seed required. We assume that 60 per cent of the required seed is home-saved and 40 per cent is purchased (based on

1995 data). However, the cost of home-saved is still included here, just as it is recorded as income in the potato bill.

Both home saved and bought are priced from the Jan-June value in the seed potato output bill.

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## 6.2 Energy; Lubricants

The energy and lubricants estimate is covered in the miscellaneous expenses category, see (6.11).

## 6.3 Fertilisers And Soil Improvers

### 6.3.1 Value of input

Fertilisers are split into four categories Nitrates, Phosphates, Potassium and Lime.

Quantity(tonnes) used for each category is calculated by multiplying application rates(kg/ha) by coverage rates(%) by crop area(ha). Crop areas come from the June census. The application and coverage rates come from the British Survey of Fertiliser Practice. The values are either an actual Scottish figure or a Scottish three-year rolling average. If neither of those exists then the equivalent GB figure is used or a three-year rolling GB average is used.

Prices per tonne for N, P and K are sourced from various market sources. Lime prices use indexed increased using DEFRA data.

### 6.3.2 Stock change

A three-year rolling average is taken for stocks, split into straights and CMPR. The Autumn nitrogen price is applied to straights, and the Autumn compound price for CMPR.

### 6.3.2 Forecast

Three-year average rates are applied to projected census areas.

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## 6.4 Plant Protection Products And Pesticides

The crop protection estimate is covered in the miscellaneous expenses category, see (6.11).

## 6.5 Veterinary Expenses

The veterinary expenses estimate is covered in the miscellaneous expenses category, see (6.11).

## 6.6 Animal Feedstuffs

Feed included in bill: Concentrates (Cattle and Sheep), Pigs Feed, Poultry Feed, Roughages, Deer and Goats Feed, Large Poultry Units Feed, Pig Only Units Feed and Inter/Intra Farm Consumption.

The total value of feed is all the above items added together plus/minus the value of stock change (due to volume).

### 6.6.1 Concentrates (Cattle and Sheep), Pigs Feed, Poultry Feed and Roughages

These are calculated using Farm Account Survey, as described in the miscellaneous expenses category, see (6.11).

### 6.6.2 Deer and Goats Feed

Deer and goat numbers (obtained from Agricultural Census) are multiplied by cost of feed per head value (obtained from SRuC).

### 6.6.3 Large Poultry Units Feed

We calculate feed at large poultry units using annual average census population figures for each poultry type for all farms excluded from the Farm Accounts Survey (Specialist poultry, horticulture and specialist pigs). The population is split into five poultry types: Hens for Laying, Pullets for Rearing, Breeding Birds, Broilers, and Turkeys.

The feed kg per bird and £ per tonne of feed for each category are taken from the SRuC Farm Management Handbook.

For each category we do:

Poultry Costs = Number of Birds x Feed kg per bird x £/tonne

For Total Poultry Costs we sum up Poultry Costs over all five categories.

### 6.6.4 Pig Units Feed

We calculate feed at pig units using average breeding population and pig figures for each pig type for all farms excluded from the Farm Accounts Survey (specialist pigs, specialist poultry, and horticulture). The number of pigs finished is split into four categories, pork, cutter, bacon and heavy using AHDB slaughter statistics.

The feed kg per pig and £ per tonne of feed for each category are taken from the SRuC Farm Management Handbook.

For each category we do:

Finisher Costs = (Number of Pigs x Feed kg per Pig x £/tonne)/1000

For Total Costs we sum up Finisher Costs over all categories.

### **6.6.5 Inter/Intra Farm Consumption**

This is the sum of the feed value of Barley, Wheat and Oats from the respective cereal output bills. The Cereal Stocks Survey estimates the amount of Barley/Wheat/Oats which is used for feed and sold to other farmers in Scotland.

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## **6.7 Maintenance Of Materials**

Included in Maintenance of Buildings (Farm Maintenance), see (6.8).

## **6.8 Maintenance Of Buildings**

### **6.8.1 Landlord Farm Maintenance**

Landlord Farm Maintenance is derived from the Rent Bill. A percentage change in rented area is applied to year t-1 landlord maintenance to arrive at landlord maintenance at year t.

### **6.8.2 Occupier Farm Maintenance**

Occupier Farm Maintenance is derived from Farm Accounts Survey data, which is based on average accounting periods. Methodology is generally similar to that described in 4.1 above.

### **Forecast**

We forecast the maintenance cost for year t by asserting a percentage change on year t-1. Percentage change is derived from the Agricultural Price Index (API).

### **6.8.3 Farm Maintenance**

Farm Maintenance = Landlord Farm Maintenance + Occupier Farm Maintenance

## **6.9 Agricultural Services**

Agricultural services (contract work) estimates are covered in the miscellaneous expenses category, see (6.11).

## **6.10 Other Goods And Services**

Other goods and services estimates are covered in the miscellaneous expenses category, see (6.11).

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## 6.11 Miscellaneous Expenses

### 6.11.1 Definitions

Miscellaneous Expenses include: Machinery repairs, Machinery fuel and oil, Other machinery expenses, Veterinary expenses and medicines, Crop protection, Contract Work (less non-agricultural labour contract work, which is included in the labour line), Leasing of quotas and Other farm costs.

Other farm costs includes: Managerial services (consultants etc), Ownership Expenses, Non-farm expenditure, Inter farm expenses, Miscellaneous Costs, Water(excluding irrigation), Water for irrigation, Council tax/rates – farm share(drainage, effluent disposal etc), Buildings insurance(fire), Electricity – farm share, Heating fuel – farm share, Other livestock costs, Other crop costs and Insurance(exclude ELI, etc).

Miscellaneous costs includes: Bank charges, Subscriptions, Periodicals, Pest clearance, Vermin destruction and gun expenses, Professional fees other than managerial, Telephone and postage stamps, Stationery, Travel and subsistence, General chemicals, Bad debts, Protective clothing, Training, Propane gas for crop protection, Advertising (for stock sales, staff etc), Car expenses by managers (where there is no manager's car), Chemical disposals and Legal expenses.

Other livestock expenses includes: Disinfectants, Detergents, Inedible litter, Stud fees, Ewe scanning, Breed society fees, Show expenses, Dairy expenses, Marketing (excluding haulage), Commission on sale, Hormone implants, Disposal of livestock related chemicals, Packing materials for livestock products e.g. egg boxes, Hire of a building to house animals or fodder and Combined labour and equipment charges.

Other crop expenses includes: Marketing charges, Packing materials, Soil analysis, Show expenses, Crop processing and preserving materials, PMB levy, Potato inspection charges, Baler twine, Potato rouging, Crop processing (for storage, seed dressing), Silage bags/nets, Stakes/wire for raspberry establishment, Stock covers, Crop advice, Potato box hire, Security guards for crops and Hire of buildings used for marketable crops.

Contract Work is taken to be the contract work output value.

### 6.11.2 Methodology

All other items except inter-farm expenses in the other farm costs are derived from Farm Accounts Survey data, which is based on average accounting periods. Methodology is generally similar to that described in 4.1 above.

Inter farm expenses are taken as the total of hired transport, commission, tolls and dealers profit for cattle, sheep and pigs, expenses for poultry, horses etc minus expenses on export store stock.

### **6.11.3 Forecasts**

We only receive FAS data that covers the first half of the final year we publish (for example in January 2012 we publish TIFF up until 2011 however the FAS data will only cover up to mid 2011) hence we need to estimate for the final half of the year. This is done in a variety of ways for different items in the bill, generally by estimating the change in the volume and the change in the price from the previous year.

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## CHAPTER 7 – INCOME ACCOUNT

### 7.1 Compensation of employees

Labour expenditures includes hours (basic, overtime, holiday, sick leave and training), benefits (accommodation, utilities and bonuses) from hired full-time, part-time and casual workers who do not have an entrepreneurial interest as well as specialist contractor costs.

Hours and benefits for full-time, part-time and casual works are all derived from a postal survey of various farming businesses.

Hours and benefits are split into gender, family, non-family and regions of Scotland (NE, NW, SE and SW).

#### 7.1.1 Hired Labour

To estimate the workers without an entrepreneurial interest, the following values are used as a percentage of the census figures:

|                        |               |
|------------------------|---------------|
| Hired Family Labour    | 22.5 per cent |
| Hire Non-family Labour | 98 per cent   |

To estimate average weekly wage and cash earning for family hired labour, the following value is used as a percentage of the non-family hired labour values from the survey:

|                               |             |
|-------------------------------|-------------|
| Average Family Weekly Wage:   | 75 per cent |
| Average Family Cash Earnings: | 75 per cent |

Hired labour costs = Hired Labour Wages + National Insurance + Employers Liability Insurance + NFU Insurance + Redundancy + Training Schemes

NFU Insurance, Training Scheme and Redundancy are all estimates.

Yearly National Insurance =  $\frac{[(\text{weekly cash earnings} - \text{National Insurance threshold}) \times \text{National Insurance Rate}] \times \text{numbers of workers} \times \text{weeks in the year}}$

Employers Liability Insurance =  $(\text{average weekly wage} \times 0.62\%) \times \text{number of workers} \times \text{weeks in the year}$

### 7.2.1 Casual Labour

Casual labour data is available from the postal survey, this data is used to calculate the average hourly rate and average cash earning hourly rate. The average number of hours worked used is from the European Union Farm Structure Survey.

Casual Labour Wages =  $\frac{\text{(average hourly rate x average number of hours worked)}}{\text{number of workers x weeks in the year}}$

Casual Labour Costs = Casual Labour Wages + National Insurance

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### 7.3.1 Specialist Contactor Labour Costs

Contract work expenditure and revenue are derived from Farm Accounts Survey data, which is based on average accounting periods. Methodology is generally similar to that described in 4.1 above.

$$\text{Specialist Contract Labour Cost} = \text{Contract Work} \times 0.35 \times (\text{Contract Work Expenditure} - \text{Revenue})$$

### 7.4.1 Own Account Capital Formation

Own Account Capital Formation (OACF) represents the capital investments made using farm labour. This is estimated from the following components based on raised farm account:

Cost of farm labour used in capital works, grant-aided  
Cost of farm labour used in non-grant-aided works

The following proportion of OACF is assigned to Hired Labour:

$$\text{Hired Labour OACF} = \text{OACF} \times (\text{Hired Labour FTE} / \text{Total Labour FTE})$$

$$\text{Total Labour FTE} = \text{Hired Labour (without an entrepreneurial interest)} + \text{Labour with entrepreneurial interest} + \text{Occupier and Spouse Labour}$$

FTE = full-time equivalent, the following conversions are used:

- 1 Occupier/Spouse working half-time or more = 0.75 FTE
- 1 Occupier/Spouse working less than half-time = 0.25 FTE

### 7.5.1 Compensation of Employees

$$\text{Compensation of Employees} = \text{Hired Labour Costs} + \text{Casual Labour Costs} + \text{Specialist Contractor Labour Costs} - \text{Hired Labour OACF}$$

## 7.2 Other taxes on production

Car licences, farm taxes (tractor, combine licences etc.) and council tax/rates are separately identified.

## 7.3 Other subsidies on production

Data for the various EC and Scottish Government schemes, not included in chapter 5, are provided by the appropriate divisions within the Scottish Government. The data are not included in the calculation of Total income from farming.

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## 7.4 Net Rents and other real estate rental charges to be paid

Scotland does not calculate rent received, only rent paid.

Gross Rent is calculated as Total tenanted area x Average rent per hectare

Tenanted Area is comes from the June Agricultural census.

As of the November 2013 to 2014 data, average Rent per Hectare comes from the Annual December Survey, which covers about 4,700 holdings renting land. (Prior to that data came from the Annual Survey of Tenanted Land in Scotland. This was a Scottish Government administered survey of about 800 tenanted holdings). The sample is stratified by farm-type and size. The response rate for these questions was around 54 per cent. A weighted average based on the area of land rented in each stratum, raised to the total census population for the June during the rental year, gives the estimated rent per hectare value. However, for some farm-types a five year average is used within the calculation, as large swings are possible caused by the low number of returns for certain farm-types. The five-year average means that data is only final in the third year.

Adjusted Gross Rent is then calculated by subtracting Benefit Value of Farmhouses and Workers' Cottages and Farmhouses/Cottages Occupied by Others from the Gross Rent. These are obtained from Farm Accounts data.

Net Rent is calculated by subtracting Maintenance (historical figure adjusted for change in rented area and inflation) and Depreciation (assumed to be 30 per cent of Adjusted Gross Rent).

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## 7.5 Net Interest paid and Financial Intermediation Services Indirectly Measured (FISIM)

**7.5.1 Types of Interest included:** Banks, SASC (Scottish Agricultural Securities Corporation), Other Institutions, Hire Purchase, Leasing and Trade Credit (Feed and Fertilisers).

Net Interest Paid = Interest paid – Interest earned

### 7.5.2 Bank Interest

The main banks and mortgage companies operating in Scotland make quarterly (end Nov, end Feb, end May and end Aug) returns of lending to Agriculture, Forestry and Fisheries. We carry out a survey of these banks and mortgage companies of the lending to Agriculture only in May every year. This enables us to calculate an estimate of quarterly lending figures that go to Agriculture alone, based around the May figure.

From the quarterly lending figures to Agriculture we can calculate the mean advances to Agriculture for the year.

We assume that 95 per cent of the mean advances are used for current farming purposes. The interest rate applied to these advances is the annual average base rate plus a premium rate. We obtain the premium rate for farming purposes from industry contacts.

### **7.5.3 SASC Interest**

We receive actual values for bank advances and interest payments direct from SASC.

### **7.5.4 Other Institutions**

Relationships between Bank Advances and volumes of other credit facilities are the three-year rolling averages as calculated from Farm Accounts Survey Data. We subtract SASC advances from the Other Institution then apply the same interest rates as those used for the Bank Interest.

### **7.5.5 Hire Purchase and Leasing Interest**

Data is taken from the Farm Accounts Survey. Interest rates applied are the same as the bank interest rates.

### **7.5.6 Trade Credit (Feed and Fertilisers)**

An interest rate of 0.25 per cent is applied to the input values for feed and fertiliser.

### **7.5.7 Interest Earned**

Data is taken from the Farm Accounts Survey. Interest rates applied to Bank assets are obtained from industry contacts.

Note: Interest paid excludes Family & Private loans as these are assumed to be interest free.

### **7.5.8 FISIM**

The total interest is then split proportionally between net interest and FISIM, using specific data from the ONS

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## CHAPTER 8 – CAPITAL ACCOUNT

### 8.1 GFCF in agricultural products

Capital formation and capital consumption are calculated and reported separately for each element.

#### 7.1.1 GFCF for plantations

*Not Calculated in Scotland.*

#### 8.1.2 GFCF for animals

Capital formation and capital consumption are estimated for cattle, pigs, sheep and poultry.

##### **Cattle**

Estimates are made for dairy cows, beef cows, dual breeds and bulls. Cows are considered as entering the breeding or dairy herd when they first calve, or when they are imported. These numbers are obtained from CTS data.

Problems currently encountered with CTS data mean that mortality, export and slaughter data for those leaving the breeding herd were not on a consistent scale with the inflow figures. The outflow has therefore been modelled using  
$$\text{outflow} = \text{breeding herd at start year} + \text{inflow (see above)} - \text{breeding herd at end year}$$
and splitting the outflow proportionally between mortality and export/slaughter using CTS data.

The price applied to the number of cows entering the breeding herd, giving capital formation, and to the withdrawals for capital consumption, is the entry price minus the withdrawal price. The entry price is the annual average price from the livestock Weekly Market Reports. The withdrawal price is a weighted average of the cull marketing price and the mortality price (assumed to be five per cent of cull price).

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##### **Pigs**

The number of pig entering the breeding herd is modelled assuming a 50 per cent replacement rate, together with changes in the size of the herd. Mortalities are assumed to be at five per cent and cull marketings is derived from inflow, mortality and the change in population.

The price applied to the pig replacements is the entry price minus the withdrawal price. The pig entry price is the gilt price. The withdrawal price is a weighted average of the cull sows and boar price and the mortality price (£0).

## Sheep

To estimate the number of animals entering the flock we use December census results and forecasts.

Entries = Shearling Ewes put to Ram Dec(n) + Ewe Lambs put to Ram Dec(n) – Ewe Lambs put to ram Dec(n-1)

December year(n) figures are estimated by applying the proportional increase in June figures to the previous year's December figure.

Withdrawals = Ewes for Breeding Dec(n-1) + Shearling Ewes put to Ram Dec(n-1) + Entries for yr(n) – (Ewes for Breeding Dec(n) + Shearling Ewes put to Ram Dec(n))

Mortality rate is assumed to be five per cent of the total breeding stock.

Marketings = Withdrawals – Mortality.

The price applied to the number of animals entering the flock is the entry price minus the withdrawal price. The entry price is taken to be the autumn market price for ewe lambs. The withdrawal price is a weighted average of the autumn market cull ewes and rams price and the mortality price (£0).

## Poultry

The calculation is based on data in the hen model, described in section 3.5.1 above. Formation is estimated as entries multiplied by the difference between the average pullet price and an average withdrawal price, where the withdrawal price equals the value of hen slaughtered divided by the number slaughtered or mortality (i.e. the weighted average price assuming zero value for dead birds). Consumption is estimated as slaughter plus mortality, multiplied by the difference between the average pullet price and an average withdrawal price.

A one per cent increase is added for other poultry.

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## 8.2 GFCF in non-agricultural products

Gross Fixed Capital Formation is estimated for buildings and works, plant and machinery, vehicles and farm cars.

### 8.2.1 GFCF in materials

#### Buildings and Works

Investment in Buildings and Work consists of the following:

Grant Aided Investments

Non-Grant Aided Investments – yearly percentage change estimated from Gross Value Added (Output-Input)

## Depreciation

Depreciation is estimated within a Perpetual Inventory Model (PIM) over a 38 year period using a depreciation method which uses variable factors for specific years. Factors range from 1/780 to 26/780. The factors are applied to the Gross Capital Formation for specific years and the sum of the values equals the amount of depreciation recorded at a 1995 constant price. The calculation is rebased to a value at the current price using the price series 'Buildings and Works: Private Sector Industrial' published by the Department of Trade and Industry.

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### 8.2.2 GFCF in machines and other equipment

The following numbers are obtained from the agricultural census carried out in December:

Different types of machinery and tractors  
Vehicles (Lorries, Vans and Pick-ups)  
Farm cars (All-Terrain Vehicles)

These figures are used to derive a yearly percentage change in Gross Stock from 2000, to give the Gross Stock at 2000 (mid-year) constant prices.

GFCF (2000 (mid-year) constant price) = Gross Stock (2000 (mid-year) previous year GFCF (2000 (mid-price) + capital retirements (derived from PIM)

GFCF at 2000 (mid-year) constant prices is converted to current prices using the following price series published by the Office of National Statistics:

Other Agricultural and Forestry Machinery  
Agricultural Tractors  
Goods Vehicles  
Passenger Cars

### Plant and Machinery

#### Depreciation

Depreciation is estimated within a Perpetual Inventory Model (PIM) over a 25 year period.

Historical levels of GCF are split into six different depreciation length as follows

8 years – 3 per cent  
10 years – 25 per cent  
12 years – 33 per cent  
15 years – 27 per cent

18 years – 3 per cent  
20 years – 9 per cent

Each of these six quantities are then depreciated over between five and eight years around their expected retirement by multiplying them by a range of coefficients, which vary between the six subsets and over duration of depreciation. This produces a matrix of values based on the length of time since the investment was made and which elements are being depreciated. These are summed to obtain total retirement for the year.

We then take the weighted percentage change in the quantities of the relevant machinery, as recorded in the census, with the weight based on their prices in the year 2000. This percentage is applied to the previous year's Estimated Gross Stock.

The change in Estimated Gross Stock is equal to GCF (at 2000 prices) less the retirements figure calculated above. This allows us to calculate the GCF at 2000 prices, which is then converted to current prices using Other Agricultural and Forestry Machinery and Agricultural Tractors price series published by the Office of National Statistics.

For capital formation a similar process to the initial stage of the retirements calculation is carried out on the six subsets, this time multiplying them by coefficient covering each year during their lifespan (plus a few years afterwards) to produce another matrix of values. These are then summed for the year and then converted to current prices using the Other Agricultural and Forestry Machinery and Agricultural Tractors price series published by the Office of National Statistics.

Finally, we add the specialist contractor value from the Farm Accounts Survey (see above for methodology), taken to be 16 per cent of the specialist contractor revenue, where

Specialist Contractors Value = 16% of (Contract Work Expenditure – Contract Work Revenue)

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### **8.2.3 GFCF in transport equipment**

#### **Vehicles**

##### Depreciation

Depreciation is estimated within a Perpetual Inventory Model (PIM) over a 12 year period using methodology similar to for buildings (section 8.2.1), with a different set of coefficients .

The calculation is converted to current prices using the Goods Vehicles price series published by the Office of National Statistics.

## 8.2.7 Other GFCF

### Farm Cars

#### Depreciation

Depreciation is estimated within a Perpetual Inventory Model (PIM) over a 12 year period using methodology similar to for buildings (section 8.2.1), with a different set of coefficients .

The calculation is then converted to current prices using the Passenger Cars price series published by the Office of National Statistics.

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## **Annex FARM ACCOUNTS SURVEY(FAS) Data**

### **Background**

The objectives of the FAS are to provide a body of physical and financial data designed:

To illuminate for policy and other purposes, the economic conditions of agriculture throughout Scotland including the monitoring of such conditions over time.

To provide information required by the Commission Regulation No 2237/77 and subsequent amendments for transmission to the EU Commission under the Farm Accountance Data Network (FADN).

### **Survey Arrangements in Scotland**

Around 500 farm accounts are collected annually from a sample of businesses representing the main farm types in Scotland. The information is collected for the Scottish Government Rural and Environment Science and Analytical Services Division (RESAS) by the Scotland's Rural College (SRUC). Individual records are submitted anonymously to the Department.

### **Sampling**

The sampling strategy of the FAS 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 FAS 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 FAS 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 2011-12 accounts all centre on the 2011 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 2011-12 accounts relate to the 2010 winter whilst others relate to that of 2011. Diagram 1 below shows the time period covered by the 2011-12 FAS.

### **Data Collected**

The following information is collected from each farm:

- a) Physical details including area, tenure, labour, and stocking, together with production and sales for most commodities.
- b) Financial data on sales of the main agricultural and horticultural products
- c) Expenditure (adjusted for creditors as necessary) on all trading inputs (including numbers or quantities where appropriate), e.g., labour, rent, feed, seed, fertilisers and miscellaneous items.
- d) Revenue (adjusted for debtors as necessary) from the sale of agricultural products (including numbers or quantities where appropriate), subsidies and other sundry receipts.
- e) Estimates of the private share of specified inputs (car expenses etc).
- f) Estimates of the value of farm products used on the farm, e.g., feed, seed, and in the farmhouse or supplied to farm workers.
- g) Opening and closing valuations of crops, livestock, livestock products, cultivations, sundry stores, machinery, equipment, vehicles and other inputs.
- h) Data on assets and liabilities. Capital expenditure and capital revenues during the accounting year (investment, including capital grants received, and disinvestment). Details of loans received and repaid. Opening and closing valuations of assets and liabilities to construct a balance sheet.
- i) For farms available for the FADN sample information on grazing days, feed allocation, buildings depreciation and the insurance of farm buildings by the occupier.
- j) An indication of the sources and levels of off-farm incomes and the hours spent on non-farming activities

More information on the Farm Accounts Survey is available from the [FAS methodology and quality note](#).

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## **AGRICULTURAL AND HORTICULTURAL CENSUS**

Each summer the agricultural census is conducted by the Scottish Government.

For census purposes farms are classified into two categories. Main farms are those above a certain physical or economic size – broadly, those of more than one hectare, or where the net value of the crops and livestock is more than about one and two-thirds European Size Units. Minor farms are those which were below this threshold at the time of the last classification. The survey of minor farms is conducted over a 3 year cycle, about one-third being surveyed each year. This means that about 26,200 mains farms and 8,800 of the 24,200 minor farms are surveyed.

Both the main and minor censuses collect information on crops, livestock and labour as at the beginning of June. In addition, main farms are surveyed in December in order to provide estimates of winter crops and livestock maintained for the next breeding season. The information is collected under the Agriculture Act 1947, and the surveys are conducted by postal questionnaire.

Two sets of administrative data are used to reduce the amount of data requested from farms on the census form.

- Those receiving EC Single Farm Payments (most main farms and some minor) complete application forms which provide all their land-use data (crops and grass).
  - All cattle data is taken from the British Cattle Tracing System dataset.
- Census forms therefore do not include requests for these data.

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