SWEDEN - Census of Agriculture 2010 – Explanatory notes

1. Historical Outline

In the first half of the twentieth century established statistical methods were introduced for production of statistics on agricultural holdings, crop areas, crop production livestock etc. In 1968, in order to improve the coordination of the statistics within the agricultural sector, Sweden established a farm register which was updated annually. The register covered all agricultural holdings with: more than 2 hectares of arable land; a large number of livestock but less than 2 hectares of arable land; and holdings with horticultural production. Since its establishment the farm register was used as a sample frame for both farm structure surveys and other agricultural statistical surveys.

The Swedish accession to the European Union in 1995 created the need for adapting national agricultural statistics to the EU legislation. Up to 2001, Sweden compiled farm structure surveys annually, switching every year between EU and national legislation. The main difference between these two consisted of the number of the characteristics surveyed. The national farm structure surveys met primarily national statistical requirements and therefore were far less extensive than the ones based on EU legislation.

The Swedish Board of Agriculture became the sole authority responsible for organizing and producing all agricultural statistics in Sweden in March 2001. Prior to that, the responsibility fell on Statistics Sweden.

2. Legal Basis and Organization

All national agriculture statistics in Sweden refer to the Official Statistics Act (SFS 2001:99), and to the Official Statistics Ordinance (SFS 2001:100) March 2001. This ordinance appoints the Swedish Board of Agriculture as the sole responsible authority for all national agricultural statistics. This gives the Swedish Board of Agriculture sole mandate to decide which organizations and authorities can conduct agricultural statistical surveys in order to meet the statistical requirements both at national and at EU level.

The Agricultural Census (FSS) 2010 was planned and conducted by the Statistics Division at the Swedish Board of Agriculture. The FSS 2010 team involved members that had worked with the survey since 2003, but also new members who were recruited and trained to especially work on the project. The project team was located in the Swedish Board of Agriculture, thus no field personnel were involved. Each person had one or more areas of responsibilities within the project. In total 27 persons were involved in the survey team

3. Reference Period or Date

The reference date was June 10th, 2010. For the farm labour force, production methods and irrigation sectors, the reference period was June 2009 to May 2010.

4. Enumeration Period

Enumeration was June to October 2010.

5. Definition of the Statistical Unit

EC Regulation 1166/2008 defines the statistical unit as an agricultural holding. “Agricultural holding” or “holding” means a single unit, both technically and economically, which has a single management and which undertakes agricultural activities listed in Annex I to the European Parliament and Council Regulation (EC) No 1166/2008 within the economic territory of the European Union, either as its primary or secondary activity. In addition, the EU regulation determines thresholds of size.

In line with the EU legislation, the census in Sweden covered all agricultural holdings, which on June 10th, 2010, met one or more of the following criteria:

- More than 2.0 hectares of arable land
- More than 5.0 hectares of agricultural land
- At least 200 m² are under glass
- At least 2500 m² outdoor horticultural cultivation
- At least 10 cattle or 10 sows or 50 pigs or 20 ewes or 1000 poultry (incl. chickens).

Holdings with forestry activity are excluded from the Census, when the holding does not meet the minimum threshold conditions of an agricultural holding.

6. Geographic Coverage

Covered the entire country.

7. Exclusions and Cut-Off Thresholds

None noted other than those stated as the minimum threshold of agricultural activity in the national definition of an agricultural holding.

8. Methodology

Use of the FAO Modular Approach

No

Frame

The Statistical Farm Register, in use since 1968 as a frame for agricultural surveys, was the frame for the 2010 Agricultural census (FSS). The frame consisted of holdings from the FSS 2007 updated with information in the Livestock Survey for the years 2008 and 2009, the Holdings Applying for Subsidies 2008, and the 2009 Integrated Administrative Control System (IACS). The frame was also updated with information from the Poultry, Sheep, and Pig Registers. In addition, a special Register Survey was sent out to 6,000 holdings that were found in the 2007 FSS population but could not be found on the IACS system in 2009.

Complete or Sample Enumeration Methods

The Agricultural census (Farm Structure Survey) 2010 was carried out as an enumeration of all agricultural holdings in the "frame", and there was no sampling, except for the Other Gainful Activities (OGA) section, in accordance with the EU legislation (EC) No 1166/2008. The Survey of Agricultural Production Methods was a stratified random sample.

Sample Design

The Survey of Agricultural Production Methods and Other Gainful Activities (OGA) of the agricultural census shared the same sample and the survey was based on a stratified random sample.

The frame was divided into 66 strata. The variables for stratification were divided into:

(1) NUTS II regions,
(2) Area of agricultural land,
(3) Number of animals of different kinds,
(4) New holdings

Simple random samples were drawn in 39 strata and total samples (100% sampling ratio) in 27 strata. Sampling ratios of 100% were used in the strata with holdings of large size because of the significant proportion that they contributed to the estimates. Sampling rations of 100 % was also applied to the strata containing new holdings from different animal registers. This was done because of the lack of information for these holdings, which made it difficult to establish a stratification strategy

For the remaining strata, sample sizes were calculated according to Neyman, based on, area of agricultural land, number of bovines, number of pigs, number of sheep and number of poultry. The final sample size for each stratum was usually chosen as the average of the sample sizes according to the various Neyman allocations. Simple random sampling was used in each of these strata and the SAS statistical package was used for sampling.

Collection Method

Five different data collecting channels were used during the Agricultural Census (FSS) printed questionnaires, web questionnaires, administrative registers, modelling, and telephone interviews. Around 76,800 holdings received an envelope containing information and the survey questionnaire around May 28th, 2010. The approximately 8,700 holdings in the sample for the Survey of Agricultural Production Methods (SAPM) received two questionnaires, the 2010 FSS and the SAPM, which included the survey of Other Gainful Activities (OGA).

Five administrative data sources were also used during the Agricultural Census (FSS), (1) IACS, (2) Bovine Register, (3) Organic Farming Register, (4) Register on Genetically Modified Crops, and (5) Register of Support for Rural Development.

Questionnaire(s)

EU Regulations require information on holding location and geo-coordinates, legal status, ownership and tenancy, land use and crops grown, irrigation, livestock, organic farming, machinery (mandatory in 2013 FSS), renewable energy installations, other gainful activities, socio-economic circumstances (full and part-time farming), labour force (family, non-family, contractors), agricultural and vocational training of the manager, inclusion in rural development support programmes, soil tillage methods, crop rotation, and erosion protection, livestock keeping places and keeping methods, animal grazing, manure application and manure storage and treatment facilities, maintenance and installation of landscape features.

For the holdings which do apply for subsides, all information on use of agricultural land and on areas with different crops was obtained directly from the IACS register. A comparison of the total agricultural area on the IACS with the one on the Farm Register gives a difference of 1.4 % (more land on IACS than on the Farm register). This means that more than 98 % of the UAA is covered in Agricultural census (FSS) 2010.

The number of the bovine animals is taken directly from the bovine register (CDB) which includes 99.7 % of all LSU for bovine. In total, four different questionnaires were designed in order to collect the data requested, three questionnaires covering the Agricultural census (FSS) variables and one covering the Survey of Agricultural Production Methods (SAPM) variables. Two of the FSS questionnaires were adopted for natural persons, one including Other Gainful Activities (OGA) variables, and another without OGA, while the third one was designed for legal persons.

Controls to Minimize Non-Sampling Errors

Computer checks were made of individual data on the questionnaires. Checking criteria were supplied for checking different parts of the report and included:

(1) Completeness checks (database)
(2) Summation and arithmetic checks (IT-system)
(3) Checks of extreme values (outliers) (IT-system)
(4) Logic and relational checks
(5) Checks of unusual combinations (database)

Data, which did not meet one or more of the checking criteria, were checked manually. In many cases the identified errors could be corrected using data from the questionnaires. In some cases the respondents were contacted by telephone and in those cases also such information was asked for, which had not been completed in the questionnaires. The instructions, which were in force for the total survey process, generally permitted the data to be corrected or completed by the staff directly on personal computers. The software used in this part of the process was SAS, and Excel.

Innovative Methodologies

An extensive use of administrative registers, use of web questionnaires, modelling and telephone interviews.

9. Data Entry, Edits and Imputations, Estimation and Tabulation

The process of data entry for the incoming paper questionnaires is divided into five operations:

(1) Sorting and organizing the incoming paper questionnaires
(2) Registration of the questionnaires
(3) Optical Scanning
(4) Verifying
(5) Transfer of data from the IT-system to the database.

The Web questionnaire processing was less labour intensive. The IT-system registers all errors occurring when a questionnaire contains information that does not fulfil the validation criteria.
The FSS personnel check all identified changes, and errors, before the information is stored on the FSS database.

Various methods were used to solve problems associated with missing data. The following were the most frequently used:

(1) Methods used to correct general information about the holdings. Analysis of holding transfers indicated on the questionnaires. This often resulted in the closure of holdings, as these holdings usually had been combined with other holdings. From the telephone directory

information was collected about telephone numbers for holdings. From the enterprise database information was collected about addresses and if holdings still exist.

(2) Methods used to complete or correct data on the survey characteristics. Telephone interviews with the respondents, The use of the Taxation Register. Information was collected about spouses and about incomes from other sources than agriculture, Information from the Farm Structure Survey 2010 for parts of the Survey of Agricultural Production Methods. Information for the same holdings from previous Farm Structure Surveys Information from the 2008 horticultural survey. Information from other registers.

10. Data Dissemination and Use

The data collected during the Agricultural Census (FSS 2010) was disseminated free of charge in the series Statistical Reports on the official website of the Swedish Board of Agriculture www.jordbruksverket.se under the heading Statistics, and on the website of the Statistics Sweden www.scb.se. These Statistical Reports were divided by subject, and in addition to the statistical results, included also a short description of the of the survey methodology. Together with each Statistical Report, a quality declaration aiming to explain the quality of the statistics was also published. The results of the Farm Structure Survey are also published together with other agricultural statistics in the Agricultural Statistics Yearbook.

From the FSS 2010, following publications/reports have been disseminated:

Name of the report	Reference	Publication data
Livestock in June 2010. Preliminary results	JO 20 1001	October 26, 2010
Holding and Holders 2010. Final results	JO 34 1101	May 10, 2011
Type of farming 2010. Swedish and EU typology	JO 35 1101	May 2, 2011
Other gainful activities on agricultural holdings 2010	JO 47 1101	June 8, 2011
Full-time farming in Sweden 2010	JO 65 1101	October 18, 2011
Use of agricultural land 2010. Final results	JO 10 1101	April 14, 2011
Livestock in June 2010. Final results	JO 20 1101	April19, 2011
Farm labour force 2010	JO 30 1101	June 16, 2011
Agricultural production methods 2010	Report	May, 2012
Irrigation and irrigation methods 2010	Report	April, 2012

The data from the FSS 2010 has also been published on the On-line Statistical Database of the Swedish Board of Agriculture, which can be found on the following link: http://statistik.sjv.se/Database/Jordbruksverket/databasetree.asp

11. Census Data Quality

The calculated national statistical results for 2010 were compared with corresponding results from the FSS of earlier years at the macro level. Some micro level results were also compared with data from earlier years. Comparisons were largely focussed on crop areas, number and types of animals and the number of farmers.

12. Data Source

Eurostat:
http://ec.europa.eu/eurostat/statistics-explained/index.php/Agricultural_census_2010

Final report:
http://ec.europa.eu/eurostat/documents/749240/749313/SE_NMR_FSS_2010.pdf/79abcd91-5757-4a72-8aea-5d0f8aae11cb

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