

NATIONAL METHODOLOGICAL REPORT

FARM STRUCTURE SURVEY 2007



TABLE OF CONTENTS

0 Summary	3
1 Introduction.....	5
1.1 History, scope	5
1.2 National legislation.....	5
2 Content	6
2.1 Characteristics	6
2.2 Questionnaires.....	6
3 Survey methodology.....	7
3.1 Survey organisation	7
3.2 Calendar (overview of work progress).....	8
3.3 Preparing the survey operations ('Planning the survey')	9
3.3.1 Population and frame	9
3.3.2 Survey design	9
3.3.3 Pilot survey.....	13
3.3.4 Informing and training the staff and respondents	13
3.4 Sampling, data collection and data entry.....	13
3.4.1 Drawing the sample	14
3.4.2 Data collection.....	14
3.4.3 Utilisation of administrative data sources	15
3.4.4 Control of the data.....	17
3.4.5 Non-response.....	17
3.5 Data processing, estimation and analysis	19
3.5.1 Methods for handling missing or incorrect item data	19
3.5.2 Estimation and sampling errors	19
3.5.3 Non-sampling errors.....	21
3.5.4 Evaluation of estimates	23
4 Publication and dissemination.....	23
Annexes.....	25

Esa Katajamäki

25.8.2008

0 Summary

The Information Centre of the Ministry of Agriculture and Forestry (IC/MAF) is responsible for the implementation of the Farm Structure Survey. IC/MAF follows the principle stated in the Finnish Statistics Act that no information included in the registers should be inquired upon again for statistical purposes; instead, the existing register data should be utilised. Following this principle, the Farm Structure Survey also makes effective use of existing register information.

Data for the Farm Structure Survey 2007 were collected mainly from two different sources: (1) statistical registers and (2) a sample survey. In the sample survey, data were gathered by telephone. A small number of farmers were also allowed to complete a questionnaire over the Internet. The purpose of the Internet survey was to test how well Internet surveys work in data gathering of this type and to gain experience for the 2010 Agricultural Census.

Most data on land use, crop areas and livestock numbers were obtained from the Statistical Farm Register. Information on horticultural crop areas was taken from the Horticultural Enterprise Register. These statistical registers are updated annually and their combined farm and horticultural enterprise population serves as a sampling frame for the structure survey. The main sources for the Farm Register are administrative registers, such as IACS, livestock registers and the Register of Organic Farming. A supplementary survey for the statistical register is carried out annually among a small number of farms without application for subsidy. The Horticultural Enterprise Register is updated mainly with horticultural survey information obtained from horticultural enterprises via a postal survey. Administrative information is also used in updating the Horticultural Enterprise Register.

Telephone interviews were used to collect information on farm labour force, other business activities, storage facilities for manure, irrigable areas as well as computers and Internet connections. The information was collected through computer-aided telephone interviews from 17 September to 5 December 2007. The interviews were conducted by some one hundred interviewers. Before the telephone interviews started, the questionnaire form was tested in a pilot survey, which resulted in improvements to the form used in previous structure surveys.

The sample used in the telephone interviews was selected as a stratified sample. The sample frame included a total of 71,179 farms and horticultural enterprises. The sample frame was based mainly on register data for 2006 and administrative sources for 2007 (IACS, livestock registers). The sample frame was stratified using three variables: farm location (20 regions), production sector of farms (7 classes) and economic farm size (4–6 classes, depending on the production sector). The final sample size was 35,517 which represents approximately one-half of farms and horticultural enterprises in Finland (31 farms were excluded from the final sample before the survey took part as it was found that they were not engaged in agricultural activities anymore).

During the interviews, it was found that 906 farms or horticultural enterprises selected for the sample had ceased operation (overcoverage). Consequently, a total of 34,642 active farms and horticultural enterprises remained in the sample. Of these, 33,496 responded to the structure survey, yielding a response rate of 96.7%. The most common reason for non-response was a farmer's refusal to respond to the survey or failure to reach a farmer. The sample frame was updated and post-stratified when the results were estimated. The frame updated with the 2007 data includes 68,230 farms or horticultural enterprises.

In Finland, the combining of data from various sources is reliable because the same farm code is used as identifying information for all sources. The published statistics can be considered reliable as they are based mainly on the register data collected in the form of exhaustive enumeration. The quality of data collected through telephone interviews is also good due to the large size of the sample and the good response rate, among other things.



25.8.2008

Esa Katajamäki

Preliminary data from the structure survey 2007 were published on IC/MAF's website www.mmtike.fi in April 2008. The final data were published in August 2008. The key results for horticultural enterprises were published in the 2007 Horticultural Enterprise Register publication.



1 Introduction

This methodological report explains how the 2007 structure survey was carried out. The report also explains the most important changes in comparison with the structure surveys of the previous years. The annexes to the report include technical work instructions, definitions and programme codes used at central stages. In this methodological survey, the shorter name “structure survey” is sometimes used to refer to the Farm Structure Survey.

1.1 History, scope

The Farm Structure Survey is a statistical survey of the structure of farms and horticultural holdings conducted in all EU and European Economic Area countries. Since the data content of the structure survey is the same in all EU countries, the study yields comparable data on agriculture in the whole of the EU. This information is important, as almost one-half of the EU budget is spent on subsidising agriculture or other primary production.

The structure survey has played a significant part in formulating the European Union common agricultural policy and in evaluating the effects of the policy; the first EU-wide structure survey was carried out as early as 1966. The benefit of structure surveys is the comprehensive, uniform and regular accumulation of data on agriculture throughout Europe.

From Finland's perspective, one of the most important functions of structure surveys is the production of comparable information on Finnish and European agriculture. The survey also enables collection of the most comprehensive data in Finland on labour usage and supplementary income generation on farms. With reference to individual farmers, the data collected by structure surveys is important, as many decisions impacting the future of agriculture are made on the basis of information gleaned from agricultural statistics.

The structure survey is carried out as an exhaustive study every 10 years (agricultural census) and, between agricultural censuses, as sample surveys every 2–3 years. In Finland, the first Farm Structure Survey was conducted in 1995, the first year of Finland's membership in the EU. Subsequent structure surveys were carried out in 1997, 2000, 2003, 2005 and 2007.

1.2 National legislation

IC/MAF complies with current EU legislation in its Farm Structure Survey. The statutory basis of the structure survey is the Council Regulation (EEC) no. 571/88. For each structure survey, this regulation has been supplemented/amended by updating its data content, among other things. The 2007 structure survey is based on Commission regulation (EC) no. 204/2006. EU legislation is being amended for the 2010 Agricultural Census and subsequent structure surveys.

No separate national legislation is necessary for the Farm Structure Survey, as comprehensive legislation on compiling agricultural statistics already exists. IC/MAF's production of statistics is based on the Act on the Information Centre of the Ministry of Agriculture and Forestry (1200/1992), the Act on Rural Business Statistics (1197/1996), and the Act on the Rural Business Register (1515/1994). IC/MAF's statistical production is further governed by Finland's Statistics Act (23.4.2004/280). The act states the principle that data once collected may not be re-included in new surveys. This is cost-effective and significantly reduces farmers' response burden, among other things.

In accordance with the Act on Rural Business Statistics (1197/1996), farms are obliged to respond to statistical questionnaires presented by IC/MAF. The same obligation also applies to the structure survey. Failure to respond may result in the imposition of a fine.



25.8.2008

Esa Katajamäki

The bulk of the information for the Farm Structure Survey was obtained from the registers. Municipal rural business authorities recorded the major part of the register data from subsidy forms submitted to municipalities by farmers. Municipal authorities are obliged to keep the information in the Rural Business Register confidential, in accordance with the Act on the Rural Business Register (29.12.1994/1515). IC/MAF is entrusted with maintaining the Rural Business Register. IC/MAF is also entitled to use administrative data included in the register for statistical purposes.

2 Content

2.1 Characteristics

The survey gathers information on the structure of farms and horticultural enterprises. In practice, this refers to data on the number of farms, production sectors of farms, ownership forms, land use, crop production, livestock production, farmers and other farm labour, time spent on agricultural work, work performed away from farms, other business activities, organic production, farm machinery and equipment, manure pits and irrigable land areas.

Data collected in the structure survey is determined by EU legislation. In addition to mandatory questions, member countries may add nationally focused questions to questionnaires. In the 2007 Finnish structure survey, the following types of data were collected for national information needs:

- Labour force: Data were collected at the person-level about farm families and permanently hired persons. Besides agricultural and horticultural work, information was collected about time spent on other business activities and forestry work
- Foreign labour force: The form included questions about the number of foreign labour force and the time they spent on agricultural and horticultural work
- Manure pits (type and adequacy of manure storage as well as information as to whether it was covered)
- Computers and Internet connections
- Information on other business activities of farms was collected in greater detail than required by EU legislation.

All EU-level mandatory data were collected in Finland with the exception of NS (Non-Significant) and NE (Not Existing) variables. Member states need not gather information that is of little significance or nonexistent. For example, if it is known that a certain plant cannot be cultivated, there is no need to ask for such information. Examples of such variables in Finland are arable areas used for the cultivation of wine, olives and rice and cultivated areas irrigated by irrigators. NS and NE variables have been negotiated with Eurostat and information about such variables is included in Commission regulation (EC) no. 204/2006.

Reference dates for the questions are as follows:

Use of arable land: summer 2007

Number of livestock: horses, pigs, poultry 1.4. 2007; cattle 1.5.2007; sheep and goats 1.6.2007.

Labour force: 1.9.2006.-31.8.2007

Other business activities of farms (M): year 2007.

2.2 Questionnaires

The bulk of the data for the structure survey was collected directly from various registers. The main source registers were the Statistical Farm Register and the Horticultural Enterprise Register as well as IACS. Data on farm labour force, other business activities, computers, irrigable area and manure storage were collected in the form of separate statistical data collection. Below is a description of the forms used in statistical data collection.



Esa Katajamäki

25.8.2008

Telephone interview

The 2007 statistical data collection for the structural survey was carried out mainly through telephone interviews, as was done in previous years. Besides telephone interviews, data collection over the Internet was tested for the first time.

Different questionnaire forms for the 2007 structure survey were tested using interviews conducted on farms. This enabled an improvement over the forms used in previous surveys. For a more detailed description of the testing and development of the form see Chapter 4.3.3.

The questionnaire form used in the telephone interviews has seven pages, of which the first two contain instructions. The form has three pages of questions related to labour force, but the individual farmer completed one of the three pages depending on farm ownership type. Besides labour force information, the form has two pages of additional questions. Thus the individual farmer had to complete a maximum of three form pages. Telephone interviews were conducted from 17.9 to 5.12.2007.

The form used in the telephone interviews is attached as Annex 1.

Data collection over the Internet

In 2007, part of data collection was carried out using an Internet form. The major function of the Internet-based data collection was to test data gathering over the Internet in preparation for the year 2010. Only family farms were selected for Internet-based data collection and, consequently, the Internet form only had the same number of labour force questions as one page of the paper form. Otherwise the content of the Internet form was practically identical to the form used in the telephone interviews.

The project included the implementation of a system that made it possible to provide users who had obtained VIPU codes with electronic PDF forms for returning information over the Internet. The system identifies the users and connects them to the right farm. The system can also be used to provide pre-filled data for the forms. The system could be used by farmers from 19.11 to 2.12.2007.

3 Survey methodology

3.1 Survey organisation

The Information Centre of the Ministry of Agriculture and Forestry (IC/MAF), was responsible for the implementation of the Farm Structure Survey. Within IC/MAF, the principal responsibility for the structure survey lay with the Statistics Unit of the Statistics Group. The Production Unit was responsible for data collection and participation in the publishing of data. The services of the ICT Management Group were utilised in matters related to information technology. The telephone interviews were outsourced to Statistics Finland.

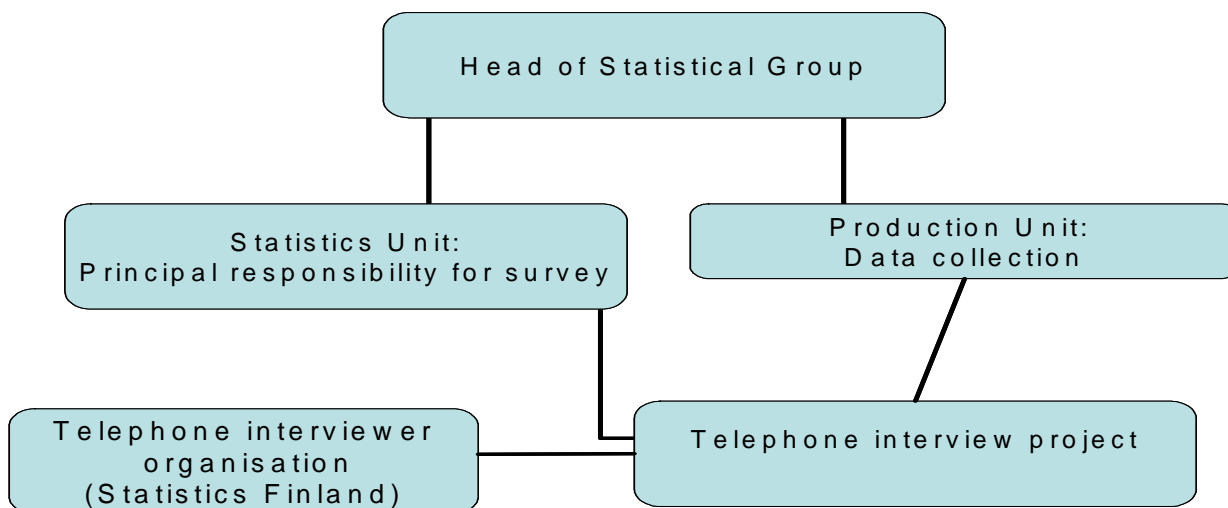
The survey was carried out mainly as regular routine work. In the Statistics Unit, the persons in charge of the survey were Esa Katajamäki and Irene Mustalahti. Esa Katajamäki was responsible for tasks related to sampling and data processing, such as sampling, extracting information from various source registers, estimation of results, editing of data, the sending of data to Eurostat and the writing of the present methodological report. Irene Mustalahti was responsible for the factual content of the survey, including the design of the questionnaire, project management functions for the telephone interviews, training of interviewers and publication of the data.

The telephone interviews and online data collection were carried out in project form. A project group, with representatives from IC/MAF and Statistics Finland, was formed for the implementation of the telephone interviews. The regional interviewer organisation of Statistics Finland was mostly used for interviews. A total of some one hundred interviewers took part in this survey.



25.8.2008

Figure 1. Organisation of the structure survey



3.2 Calendar (overview of work progress)

Planning for the Farm Structure Survey started in the autumn of 2006. This time, a pilot survey was conducted to test the questionnaire forms. A stage that was new compared to previous surveys was the testing of data collection using online forms. Telephone interviews were conducted in the autumn of 2007 and the data from different sources were combined and processed in the spring of 2008. Data were sent to Eurostat and published mainly over the course of the summer of 2008. The main survey stages and their schedule were as follows:

- | | |
|---|----------------------------|
| • General project planning | Autumn 2006 – Spring 2007 |
| • Testing of questionnaire form | December 2006 – March 2007 |
| • Telephone interviews | |
| ○ sample design/sampling | May – June 2007 |
| ○ Design of questionnaire form | April – June 2007 |
| ○ Training of interviewers | August 2007 |
| ○ Execution of interviews | September – December 2007 |
| ○ Data checking and editing | December 2007 – April 2008 |
| • Data collection using online forms | March 2007 – February 2008 |
| • Gathering of data from various source registers | February – May 2008 |
| • Publication of results nationally | |
| ○ Preliminary information | May 2008 |
| ○ Finalised information | August 2008 |
| • Data sent to Eurostat | June – July 2008 |
| • Writing of methodological report | July – August 2008 |

3.3 Preparing the survey operations ('Planning the survey')

3.3.1 Population and frame

Population

The target group of the survey is made up of all farms and horticultural enterprises engaged in agricultural production or horticultural production intended for sale. A farm or horticultural enterprise is a holding or business that has a utilised arable land area of at least one hectare or at least one animal unit of livestock, and those horticultural enterprises with less than one hectare of arable land which are engaged in horticultural production intended for sale (e.g., greenhouse enterprises). Farming for a household's own consumption is not included under active farm operation.

In previous years, the lower limit used for the population was the lower limit conforming to the EU structure survey; that is, the utilised agricultural area should be at least one hectare or the economic farm size should be at least one European Size Unit (ESU). The 2007 survey included all farms specified by the Farm Register and horticultural enterprises listed in the Horticultural Enterprise Register. In practice, the change in the definition did not result in any significant change in the number of farms included in the population.

Sample frame

The sample frame included all farms recorded in the 2006 Farm Register, all horticultural enterprises in the 2006 Horticultural Enterprise Register and farms that were new applicants for farming subsidies in 2007. A large proportion of horticultural businesses in the Horticultural Enterprise Register are also farms. The sample frame included a total of 71,179 farms and horticultural enterprises. The registers used for forming the sample frame (Farm Register, Horticultural Enterprise Register and IACS) are updated annually.

The sample frame was quite up to date: at the time of sampling, most data were approximately one year old. In the case of new farms, the information reflected the situation during that spring, because the information was retrieved from the administrative register (IACS) on the basis of subsidy applications submitted in the spring of 2007. Between 2006 and 2007, close to 3,000 farms or horticultural businesses ceased operation. However these particular farms were also included in the sample frame. The sample frame was updated based on the 2007 register data at the time when the results of the survey were estimated. Consequently, this overcoverage due to the inclusion of farms that had ceased operation did not pose a problem at the estimation stage.

As the Farm Register, the Horticultural Enterprise Register and the IACS Register use the same farm code, the consolidation of those registers in the sample frame resulted in a reliable outcome.

3.3.2 Survey design

The bulk of the information for the Farm Structure Survey was collected as an exhaustive survey (data obtained from different registers). Data that were not obtained from registers (questions related to labour force and other business activities on farms, irrigable area, computers and Internet connections as well as questions related to manure pits) were collected by telephone in the form of a sample survey. The same questionnaire was also sent to 500 farms in the form of an online questionnaire. The description below applies mainly to the sampling method used in the telephone interviews. The sample used in the online survey was a random sample taken from among family farms that had VIPU codes and that had not been included in the telephone interview sample. The online survey included Finnish-speaking farmers only because the online form had not been translated into Swedish for this stage of the test. The main purpose of the online survey was to test the data collection method using a small number of farms and, consequently, it was possible to compromise on the representativeness of the sample.



25.8.2008

Esa Katajamäki

The sample used in the telephone interviews was selected as a stratified sample. The sample frame was stratified using three variables: farm location (20 regions), production sector of farms (classes) and the economic size of farms (4–6 classes, depending on the production sector). Following initial stratification, small strata (with few farms) were combined. The total number of strata was 654.

The sample was allocated as the mean of relative and optimal allocation methods (Neymann allocation). The allocation variable was the economic size of the farm based on the 2006 register data. The allocation method resulted in a sample with farms drawn randomly and evenly from all over Finland, yet in such a way that the sampling increased with farm size. For livestock farms, the sampling ratio was greater than for farms engaged in crop production, as variances of economic size for livestock farms were greater than for farms engaged in crop production. The sample size was 35,517 farms and horticultural enterprises (representing 49.9 percent of all farms).

All farms with an economic size of 100 ESU or more or with a minimum of 10,000 broiler chickens in 2006 were selected for the sample. In addition, all greenhouse enterprises of 10,000 square metres or more in size were selected for the sample. In Finland, broiler chickens are centred on major farms and it is difficult to obtain a representative sample from such farms because some areas only have a few large broiler chicken farms. For that reason, all of them were selected for the sample.

The telephone interview sample is drawn independently for each individual survey. Thus the 2005 sample was ignored in the 2007 sampling (for example, none of the 2005 sample respondents were exempted from the 2007 sample). Similarly, the inclusion of a farm in another IC/MAF sample survey was not a reason for exempting the farm from a structure survey sample. Data collection was co-ordinated with the autumn crop survey. If a farm was included in both samples, the same interviewer gathered data from the farm all in one go.



Table 1. Number of farms in the sample frame and in the sample by region in 2007¹

Region	Sample size	Number of farms in the frame	Sampling ratio (%)
01 Uusimaa	1,493	2,995	49.85
02 Varsinais-Suomi	4,048	7,657	52.87
04 Satakunta	2,216	4,606	48.11
05 Kanta-Häme	1,433	2,793	51.31
06 Pirkanmaa	2,372	5,205	45.57
07 Päijät-Häme	1,147	2,195	52.26
08 Kymenlaakso	1,187	2,477	47.92
09 Etelä-Karjala	936	1,959	47.78
10 Etelä-Savo	1,569	3,421	45.86
11 Pohjois-Savo	2,717	5,023	54.09
12 Pohjois-Karjala	1,498	2,945	50.87
13 Keski-Suomi	1,684	3,786	44.48
14 Etelä-Pohjanmaa	3,766	7,957	47.33
15 Pohjanmaa	2,419	5,049	47.91
16 Keski-Pohjanmaa	1,082	1,733	62.44
17 Pohjois-Pohjanmaa	3,160	5,892	53.63
18 Kainuu	646	1,217	53.08
19 Lappi	978	2,032	48.13
20 Itä-Uusimaa	818	1,582	51.71
21 Ahvenanmaa	348	655	53.13
Total	35,517	71,179	49.90

¹ Original sample size was 35 548 farms (see table 4). 31 farms were dropped before sending questionnaires (overcoverage). These 31 farms are not included in this table.



Table 2. Number of farms in the sample frame and in the sample by economic size in 2007²

Size class (ESU)	Sample size	Number of farms in the frame	Sampling ratio (%)
0-1 ¹	335	762	43.96
1-2	246	1,532	16.06
2-4	698	4,540	15.37
4-6	1,334	8,967	14.88
6-8	1,738	7,098	24.49
8-12	1,238	5,162	23.98
12-16	3,112	7,242	42.97
16-40	2,025	5,028	40.27
40-100	12,634	16,979	74.41
100-250	10,006	11,716	85.40
250-	2,151	2,153	99.91
Total	35,517	71,179	49.90

¹ Includes farms with new applications for subsidy; economic size in 2006 unknown

Table 3. Number of farms in the sample frame and in the sample by production sector in 2007²

Production sector	Sample size	Number of farms in the frame	Sampling ratio (%)
Milk production	11,584	15,196	76.23
Other cattle husbandry	2,809	4,279	65.65
Pig husbandry	2,292	2,958	77.48
Poultry husbandry	647	921	70.25
Sheep and goat husbandry	367	846	43.38
Horse husbandry	622	2,165	28.73
Cereal production	10,245	28,450	36.01
Special crop production	2,509	4,239	59.19
Horticulture	1,301	2,154	60.40
Other crop production	1,689	6,726	25.11
Other production	237	1,137	20.84
Non-farm horticultural enterprises	886	1,412	62.75
New applicants for subsidy	329	696	47.27
Total	35,517	71,179	49.90

² Original sample size was 35 548 farms (see table 4). 31 farms were dropped before sending questionnaires (overcoverage). These 31 farms are not included in this table.



Esa Katajamäki

25.8.2008

3.3.3 Pilot survey

No actual pilot survey was carried out for the 2007 structure survey. Instead, the telephone interview questionnaire was improved in cooperation with the Survey Laboratory of Statistics Finland. In that context, 16 farmers were visited and the questionnaire was improved considerably as compared to the 2005 version.

3.3.4 Informing and training the staff and respondents

Training the telephone interviewers

The interviews for the structure survey were conducted by the Statistics Finland interviewer organisation. A two-hour training session on the Farm Structure Survey was provided for the interviewers. A total of six separate training sessions were held in four localities (Helsinki, Tampere, Turku and Oulu). Training was provided by the persons responsible for IC/MAF's Farm Structure Survey. The interviewers were also provided with an interviewer's guide booklet containing all the necessary instructions and background information. A representative of MTT Agrifood Research Finland also took part in training and the preparation of training materials that dealt with issues related to other business activities. Many of the interviewers had already participated in the collection of structure survey data in 2003 and 2005.

Dissemination of information

The focus was on informing farmers, municipal rural business officers, Farmers' Union and advisory organisations. Farmers were notified mainly through the farming press. Information on the Farm Structure Survey was also published on the IC/MAF website. An informative meeting was held for interest groups at IC/MAF's premises in spring 2007 with the aim of providing information on IC/MAF's various data gatherings.

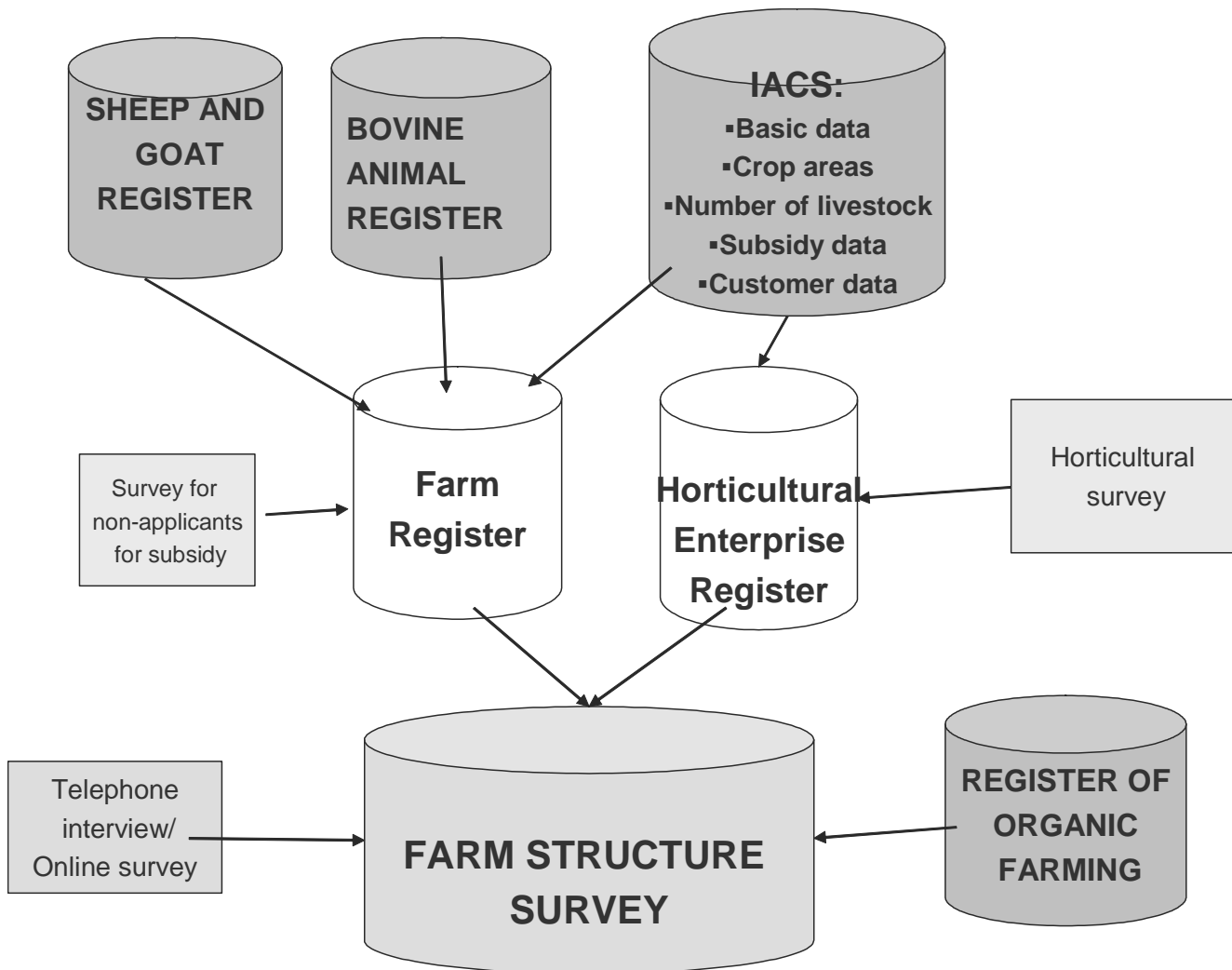
3.4 Sampling, data collection and data entry

IC/MAF follows the principle stated in the Finnish Statistics Act that no information included in the registers should be inquired upon again for statistical purposes; instead, the existing register data should be utilised. The bulk of the data for the Farm Structure Survey 2007 were obtained from the Statistical Farm Register and the Horticultural Enterprise Register. These registers are updated by using, besides a statistical questionnaire, the Rural Business Register and livestock registers as data sources. The Rural Business Register includes information from subsidy application forms submitted by farmers annually. This register can be used to obtain information about aspects such as arable land use and livestock (horses, pigs, and poultry). Cattle numbers are obtained from the Bovine Register and sheep and goat numbers from the Sheep and Goat Register. The Register of Organic Farming was also used as a source for the structure survey.

However, not all data needed for the Farm Structure Survey are obtained from registers. Data missing from registers (labour force, other business activities on farms and a few individual questions) were supplemented through telephone interviews and online surveys. Figure 1 presents the data flows in the structure survey; in other words, what the various registers and statistical surveys that provide information for the structure survey are.



Figure 2. Data flows of the structure survey



3.4.1 Drawing the sample

The sampling method used for telephone interviews was stratified random sampling. The sample farms were drawn randomly using a random number generator. The sampling software used was the SAS. The sample was drawn using the survey design presented in paragraph 3.3.2.

The sample for the online survey was also drawn using the SAS. The online sample was also drawn at random using the survey design presented in paragraph 3.3.2.

3.4.2 Data collection

The data needed for the structure survey were collected from a number of different sources and data collection for these source materials is slightly different. Below is a description of data collection from the



25.8.2008

Esa Katajamäki

viewpoint of telephone interviews and the online survey. The use of registers and administrative data is described in paragraph 3.4.3.

Organisation of interviews

The data were collected as computer-aided telephone interviews at Statistics Finland. The interviews were conducted by some one hundred field interviewers from different parts of Finland.

The online data collection was carried out as a project which had a project organisation specifically created for it. The project was implemented as a cooperative undertaking of the Statistics Group and the ICT Management Group. Project leadership was the responsibility of the Production Unit of the Statistics Group.

Data collection

The data were collected as computer-aided telephone interviews (CATI). The actual field interviews commenced on 17 September 2007 and were completed on 5 December 2007. A few days before interviewing commenced, the questionnaires were posted to the farmers. The forms posted were clustered in two batches. After the forms were sent, interviewers called the farmers and entered the data on the computer during the interview, using BLAISE software. In cases where the farmer had not yet completed the form, a new appointment was often made for the interview. If the farmer had not received the form or had misplaced it, the interviewers sent him/her a new one individually. Farmers also had the option of calling the interviewer directly and providing the information on the telephone. Such calls were free of charge to farmers. The phone-in service was available during the entire data collection period from 8.00 am to 8.30 pm on weekdays and from 10.00 am to 4.00 pm on Saturdays.

During the interview, the data provided were automatically submitted to logical checks. For example, the BLAISE software checked that the values provided were within a predetermined range. In other words, the software would not accept values that were logically too high.

Besides telephone interviews, 500 farmers were given a chance to reply to the survey over the Internet using the VIPU service.

3.4.3 Utilisation of administrative data sources

According to the principle mentioned above in this methodological report, no information included in the registers should be inquired upon again for statistical purposes; instead, the existing register data should be utilised. The bulk of the data for the Farm Structure Survey of 2007 were obtained from statistical registers, i.e. the Farm Register and the Horticultural Enterprise Register. These registers provided practically all data on areas and livestock numbers needed for the structure survey. Only organic farming areas and organic livestock numbers were extracted from administrative data sources for inclusion in the structure survey database.

Thus administrative data are used very little as direct data sources for the Farm Structure Study; instead, statistical registers are used as sources, which are updated using administrative registers. This section describes how administrative registers are used as sources for the Farm Register and the Horticultural Enterprise Register.

The Farm Register

The Farm Register is a complete enumeration, in which the population is comprised of all the farms engaged in agricultural production that have a minimum of one hectare of utilised agricultural area or that have at least one livestock unit. Horticultural enterprises that are only engaged in greenhouse production are not included in the population.



25.8.2008

Esa Katajamäki

Besides basic farm data (farm code, production sector, legal form, location, etc.), the Farm Register contains data on the arable land use of farms, crop areas and livestock numbers. Sources used are the Integrated Administration and Control System (IACS), the Bovine Register, and the Sheep and Goat Register. IACS provides data on arable land use, crop areas and the number of horses, pigs and poultry. Cattle numbers are updated from the Bovine Register and sheep and goat numbers from the Sheep and Goat Register. In 2007, for the first time, the Farm Register was updated using the Pig Register as well. It was done to ensure that all pig farms and their livestock numbers were included in the Farm Register more extensively than before. Data are copied from administrative registers into the Farm Register annually in October when all the applications for subsidy have already been recorded and no significant subsequent changes will be made to the administrative data.

The main responsibility for the maintenance of the Rural Business Register lies with IC/MAF. The data in the IACS are recorded by the municipal rural business authorities. Pro Agria's Agricultural Data Processing Centre Ltd manages the practical maintenance aspects of the Bovine Register. The Sheep and Goat Register is maintained by the Finnish Food Safety Authority Evira. The IACS data are gathered from the basic agricultural aid application forms supplied by farmers. Data in the Bovine Register come from farmers' declarations on the number of cattle that are either born or have left the farm.

The Rural Business Register covers all farms in Finland, including farms that have discontinued agricultural production and farms that have not applied for agricultural subsidy. Consequently, the coverage of the Farm Register, too, is very nearly 100 per cent. The IACS, which forms part of the Rural Business Register, covers about 98% of the farms engaged in agricultural production. Every year, only 2–3 % of the farms do not apply for agricultural subsidy. For such farms, IC/MAF updates the Farm Register data using an annual statistical questionnaire. Thus the Farm Register covers practically all farms in Finland.

Horticultural Enterprise Register

The population of the Horticultural Enterprise Register includes all enterprises engaged in commercial horticultural production. The business population is updated annually. New businesses are sought out in administrative registers, such as the Integrated Administration and Control System (IACS) within the Rural Business Register and the Finnish Food Safety Authority Evira registers on plant protection, seedling stocks, vegetable quality control and organic farming. These administrative data sources are used for supplementing the population and partly also for pre-filling the questionnaires.

The Horticultural Enterprise Register is updated annually using a postal survey. It is an exhaustive survey and the register is comprehensive. A large proportion of the businesses in the Horticultural Enterprise Register are also included in the Farm Register. In 2007, the Horticultural Enterprise Register contained some 5,200 businesses, of which close to 4,000 were also included in the Farm Register. The Farm Register excludes mainly pure greenhouse businesses. Horticultural Enterprise Register data on greenhouse areas and certain horticultural plant areas are used for the structure survey.

Integration of administrative and statistical data

Soon after joining the EU, Finland decided to use the same farm code in administrative registers as was used in the Farm Register and the Horticultural Enterprise Register, established earlier. Since the same identification code is used in all registers and the basic units are identical in them, it is relatively easy to integrate the different register data, and the units in the various registers can be linked in a very reliable manner. As the updating of statistical registers is not based on the use of purely administrative data and the data are supplemented with separate surveys as needed, the combination of administrative data and the gathered statistical data results in data that are statistically comprehensive.

In the case of farms that apply for agricultural subsidy, there is practically no undercoverage. The most likely undercoverage occurs in the group of farms without application for agricultural subsidy. Data on such farms are updated annually using a statistical questionnaire, which is sent to all farms that have not applied for subsidy and that, according to the registers, have been active farms in previous years. The Farm Register



25.8.2008

Esa Katajamäki

includes approximately 1,000 farms without application for subsidy. All farms have been registered in the Rural Business Register regardless of whether or not they have applied for subsidy. There has sometimes been a problem with the classification of farms without application for subsidy as either active or passive because not all farmers reply to the questionnaire sent to farms without application for subsidy.

The coverage problem with the Horticultural Business Register is similar to that with the Farm Register. For farms without application for agricultural subsidy there is a small risk of being excluded from the Horticultural Enterprise Register. A small undercoverage has no significant effect on the results related to horticultural businesses either.

In Finland, questions required for statistical purposes have been added to subsidy application forms. In that respect, subsidy application forms have been designed in cooperation with the agricultural administration and IC/MAF's Statistics Group. For this reason, data such as those extracted from IACS also match well with data required for statistics as far as definitions are concerned. However, the integration of administrative and statistical data definitions is not always completely problem-free. For example, crop area data are collected in subsidy application forms in much greater detail than in the structure survey. In 2007, IACS included data on some 250 different plants. In the structure survey, those data had to be summed up as areas divided by some 50 different plants. It is not always clear in what class the various IACS areas should be placed in the structure study. An example of this is the structure survey variable "fresh vegetables, melons and strawberries" (D14), which has been divided into two on the basis on rotation (rotation with other crops and rotation with horticultural plants). This rotation cannot be obtained from IACS; instead, the classification had to be done by the plant.

3.4.4 Control of the data

The telephone interview program (BLAISE) included several controls. The software rejected responses that were outside the value range. The interview software also ensured that data were recorded in every field. The interviewer had a great deal of background information on the farms at his or her disposal, e.g., the arable land area and livestock numbers. If the irrigable area was reported to be greater than the farm's total arable land area, the program would raise an alert. Similarly, the program would alert the interviewer if he or she was attempting to enter information on manure stores, although there was no livestock on the farm.

The online survey made use of checks and limit values that were similar to those used in the telephone interviews. The software alerted the farmer of illogical and erroneous values if needed and asked for correction in the case of an error.

IC/MAF's Statistics Group checked the same items once more as had been checked by the BLAISE software and in connection with the online questionnaire. In addition, the data were subjected to several logical checks, the minimum and maximum values were ascertained, and checks were made for missing information. The checks were made using the SAS software. Due to the numerous controls built into the interview software, very few deficiencies were found by IC/MAF. The errors and missing information found were corrected at IC/MAF. Efforts were made to supplement other register data to make up for missing information; for example, personal information missing from answers to labour force questions was supplemented with data obtained from the Population Register.

3.4.5 Non-response

An attempt to minimise non-response rates was made by giving farmers information about the Farm Structure Survey. Emphasis was laid on the use of register information as a data source, as farmers are reluctant to respond to the same questions twice. As the telephone interviews got under way, leading farming press carried articles and advertisements on the survey in question.

Compared to the postal questionnaire, the telephone interview has proved to be an effective interview method. The non-response rate is very low. Also on this occasion, the telephone interviews were successful;



25.8.2008

Esa Katajamäki

of the farms included in the sample only 1,146 (3.3%) failed to supply the information. In addition to the above-mentioned reasons, this high response rate was achieved in the following manner:

- A great deal of trouble was taken in order to reach farmers (several attempts to telephone farmers, number checked if necessary)
- National legislation obliges farmers to respond to IC/MAF surveys
- If farmers refuse to comply, they may be subject to a penalty payment (no farmer was fined in connection with this survey, nor has it been necessary in the past)
- The sampling frame (the Farm Register and the Horticultural Enterprise Register) are updated annually and the contact information is mainly up to date.

Compared to telephone interviews, the response rate for the online survey was clearly lower: approximately 23%. The major reason for the low response rate in the online survey was the fact that this survey was voluntary for farmers and the main purpose of the project was to test the technical functioning of the online survey. However, this result of the pilot project was a pre-indication that the response rates for future online surveys may be clearly lower than those for telephone interviews.

In the telephone interviews, the main single reason for non-response was a refusal by a farmer to be interviewed. The next most important reasons were that no one answered the phone on the farm or that the person was avoiding the interview.

Table 4. Non-response and overcoverage in the structure survey telephone interviews in 2007

Gross sample	35 548	
Of which:		
Overcoverage	906	
- Farmer died	34	
- Farm sold, merged with another farm	73	
- Production ended, arable land leased to others	408	
- Production ended, arable land under forestation	15	
- Production ended, farm closure pension	67	
- Production ended, other reason	233	
- Other gross non-responses	76	
		%
NET SAMPLE	34 642	
Interview obtained	33 496	96.7
Non-response	1 146	3.3
- Refused	436	
- Farmer avoided interview	210	
- No one reached on the farm	357	
- No telephone number found	96	
- Prevented by illness or injury	26	
- Other net non-responses	21	



3.5 Data processing, estimation and analysis

3.5.1 Methods for handling missing or incorrect item data

1,146 farms that refused or otherwise failed to respond remained outside the survey. The exclusion of these farms was taken into account in estimation by calculating new weighting coefficients that allowed for the deficit (see paragraph 3.5.2).

The interview software did not allow for missing responses, so almost all responding sample farms provided complete information. However, there were rare exceptions where the farmer did not supply all information. In such cases, the interviewer was able to enter the missing data. For example, some persons in agricultural occupations failed to disclose their year of birth and/or gender details. It was possible to fill in these gaps mainly from the Farm Register or IACS customer records in the case of farmers and their spouses. For other members of farmers' families, the information was supplemented from the Population Register.

Some data on working time was also missing from the telephone interview data. In such cases the gaps in the data were filled by using similar persons' average working time data. For example, if the working time spent by a milk-cattle farmer's wife on farm work was missing, the information was supplemented with the average working time of milk-cattle farmers' wives. Missing data were so scarce that they were dealt with on a case-by-case basis and case-specific discretion was also used in individual cases. Information on livestock numbers on the farm and the farmer's employment outside the farm, among other things, was used in such discretion.

Corrections made to the data were the responsibility of the researcher in charge of the Farm Structure Survey at IC/MAF. All corrections/changes were made by order of the researcher.

The final validation of the data in the Farm Structure Survey was carried out at Eurostat using the regular validation program. The seventh data version was final for Finland. Only a few mainly technical errors were found in the final files. The errors were fairly small and were corrected in a few weeks. The final version of the 2007 Farm Structure Survey was sent to Eurostat at the end of July 2008.

3.5.2 Estimation and sampling errors

The bulk of the data for the Farm Structure Survey were collected as a complete enumeration, and so no particular estimation methods were required on that part. The sample used in the telephone interviews was drawn as a stratified sample. The stratification was updated and checked after data gathering, using the most recent register data (post-stratification). The weighting coefficient at stratum level was determined as follows:

stratum weighting $h = N_h / (n_h - m_h)$,

where N_h = number of farms in stratum h

n_h = number of sample farms in stratum h and

m_h = number of non-respondent sample farms (= non-response) in stratum h.

Estimation of the results was carried out using the SAS software following the above weighting coefficients. Variances were estimated using the CLAN software. Mean errors for the key variables are mostly just under or above one percent. Table 5 shows estimates and error variances for a few of the most important variables collected using telephone interviews.



25.8.2008

Esa Katajamäki

One way to describe the reliability of a sample is to compare the data estimated for farms included in the sample to the total data in the case of those data which are known from all farms. In the structure survey, this kind of comparison was possible to do for livestock numbers and crop areas. Such comparisons were also undertaken in connection with post-stratification. An attempt was made to calibrate the stratification in such a way that the values estimated from the sample were as close as possible to the “actual” values calculated from the total data. Table 6 compares certain data that were estimated from the sample and those obtained from the total data. The estimated values for the key crop areas and livestock numbers differ very little from the actual values, i.e., less than two percent in most cases.

Table 5. Structure survey: estimates and mean errors in 2007

Variable		Estimate	Mean square error (%)
	Labour force as person-years		
A13	Farmer (family farms and group holdings)	37 581	0,24
A15	Spouse of farmer	15 207	0,23
A16	Family members	7 146	0,47
A17	Permanent employees	5 351	1,40
A18	Temporary employees	4 662	1,66
	Other gainful activities (number of farms)		
M01a	Tourism	1 169	4,29
M01b	Handicraft	160	13,80
M01c	Processing of farm products	445	5,55
M01d	Wood processing	472	6,84
M01e	Aquaculture	43	18,80
M01f	Renewable energy production	417	6,43
M01g	Contract work	9 011	1,22
M01h	Others	7 150	1,59
	Irrigable area (ha)		
I03a	Total irrigable area	76 745	1,21



25.8.2008

Esa Katajamäki

Table 6. Structure survey: differences between estimates and actual values in 2007

Variable	Actual value from register	Estimate	Difference	
			Difference	%
Areas (ha)				
Utilised arable land	2 292 286	2 330 672	-38 386	-1,67
Wheat	203 901	209 066	-5 165	-0,23
Rye	31 964	31 506	458	1,43
Barley	550 119	561 010	-10 891	-1,98
Oat	381 001	389 245	-8 244	-2,16
Potato	27 589	28 155	-566	-2,05
Sugar beet	15 960	16 254	-294	-1,84
Outdoors: vegetables, strawberry, etc.	11 850	12 188	-338	-2,85
Greenhouse area	276	280	-4	-1,45
Fodder crop (grasslands, etc.)	657 767	663 664	-5 897	-0,90
Turnip rape and oilseed rape	90 197	92 031	- 1834	-2,03
Number of livestock				
Horses	29 716	29 577	139	0,47
Cattle	926 694	944 031	-922	-2,70
Dairy cows	296 069	298 272	-2 205	-0,74
Pigs	1 448 041	1 458835	-1 885	-0,13
Sheep	119 252	116 179	3 073	2,58
Hens (incl. chickens, 1,000)	4 262	4 098	164	3,85

3.5.3 Non-sampling errors

Undercoverage

In Finland, the registers are updated annually, so undercoverage does not pose a significant problem. In the case of farms that apply for agricultural subsidy there is practically no undercoverage. The most likely undercoverage occurs in the group of farms without application for agricultural subsidy. Data on such farms are updated annually using a statistical questionnaire, which is sent to all farms that have not applied for subsidy and that have been active farms in previous years, according to the registers. In 2007, the Farm Register included fewer than 1,000 farms without application for subsidy. All farms have been registered in



25.8.2008

Esa Katajamäki

the Rural Business Register regardless whether or not they have applied for subsidy. The problem in the case of farms that have not applied for subsidy is only their classification as active or passive farms.

The coverage problem with the Horticultural Business Register is similar to that with the Farm Register. For farms without application for agricultural subsidy there is a small risk of being excluded from the Horticultural Enterprise Register. IC/MAF actively updates the Horticultural Enterprise Register by monitoring notices issued in horticultural newspapers, magazines and other sources. A small undercoverage has no significant effect on the results related to horticultural businesses either.

Measurement errors

Farm Register/Rural Business Register

The Farm Register is utilised mainly for arable land areas and livestock numbers. For farms that apply for agricultural subsidy, the data are collected in connection with subsidy applications. Farmers tend to fill in subsidy applications meticulously almost without exception, due to possible sanctions. Errors in land areas and livestock figures are usually minor and result from misunderstandings, lack of time or inaccurate recording.

In the case of farms that had not applied for subsidy, land areas and livestock numbers were obtained through a separate statistical survey. These farms are often small and their owners elderly. The farmers want to cultivate a small area, mainly as a hobby. These farms often have only grassland and/or fallow land. It is sometimes difficult to decide whether such farms are active or not.

Telephone interviews

Farmers found the questions concerning labour force and the farm's other business activities very difficult. One of the problems was the calculation of working time afterwards because most farms do not keep account of working time. In such a case, tasks such as calculating the annual working time spent on farm work was sometimes challenging. In previous surveys, forestry work may have been included in farm work to a certain extent but, from the year 2005 on, working time spent on forestry work has been a separate item in the questionnaire. Even now the classification of certain tasks is open to various interpretations in some cases; for example, it is not always clear at what point farm or horticultural production becomes further processing, that is, another business activity.

In Finland, on livestock farms in particular, farmers and other persons engaged in farm work spend more than 1,800 hours on farm work per year, that is, more than one person-year. However, when person-years are counted, such persons working more than 1,800 hours are counted statistically as one person-year, though 1,800 working hours would be sufficient. Consequently, person-year calculations underestimate the amount of work performed on farms, at least in the largest class.

Processing errors

Due to numerous controls and checks, data processing errors are extremely unlikely. However, the possibility of errors did exist, e.g., when the files were transferred from Statistics Finland to IC/MAF, or when data from various registers were merged. The material from telephone interviews was carefully checked on arrival at IC/MAF. As the various registers use the same farm identification code, combining of register data was also relatively trouble-free.

A small chance for processing errors also exists when data are reworked so that they comply with the form specified by Eurostat. Sometimes it is challenging to modify the data from the form used on the data collection questionnaire to the form required by variables in the structure survey. Various errors can take place when data are modified; for example, work force data were collected as working hours and then changed to person-years as required by Eurostat. However, Eurostat's validation process is extensive, which also makes the chance for errors very small.



Esa Katajamäki

25.8.2008

3.5.4 Evaluation of estimates

In Finland, arable land areas and livestock numbers of farms are updated annually in the Farm Register. Areas under horticultural plants are recorded in detail in the Horticultural Enterprise Register, also updated annually. The data in the Farm Structure Survey match those in the Farm Register and the Horticultural Enterprise Register, as the information from them has been used unchanged in the Farm Structure Survey.

Besides the Farm Register, data on livestock numbers are collected through a sample survey conducted annually in December. Differences between the structure survey and sample survey livestock numbers are small. Data on livestock numbers are also compared with the data in the administrative livestock registers (the Bovine Register and the Sheep Register). Also in this respect, the data in the structure survey agree with those in the livestock registers. This is natural because data in the structure survey are extracted from those source registers. Data on pig numbers have been compared with the data in the Pig Register. The problem in this comparison is that the data in the Pig Register are not yet fully comprehensive. It has been noticed, however, that a small percentage of the farmers have failed to report the number of their pigs on the subsidy application form. In 2007, data on pigs on some pig farms were supplemented with data taken from the Pig Register. This way the data on pig numbers were made more comprehensive. There continue to be differences in livestock numbers between the Pig Register and the structure survey, but such differences are mainly due to the fact that the Pig Register was not yet fully comprehensive in 2007.

Comparing the data on agricultural labour with other data is more problematic. Statistics Finland collects information on labour through an annual survey, but due to a disparity in definitions, the results are not directly comparable. The Statistics Finland labour force data are based on information by business sector. The Farm Structure Survey includes all persons on a farm engaged in agricultural occupations.

The labour force data can be compared with previous Farm Structure Survey results and other statistics. For decades, the numbers of both farms and people in agricultural occupations have declined steadily. The decline has continued in the period between the 2005 and 2007 Farm Structure Surveys. In this respect, the results were as expected. With respect to workforce data, the work contribution to farm work decreased definitively between the 2003 and 2005 surveys. One of the reasons may have been that as late as 2003 part of forestry work was probably included in farm work. Since 2005, the questionnaire has had separate questions related to forestry work. In 2007, working time was indicated in person-hours whereas in 2005 it was in person-days. There is reason to investigate in the future whether the change in the unit of measurement influenced the results as far as labour force is concerned.

Questions on farms' other business activities were included for the first time in the 2000 agricultural census. From 2005 to 2007, the growth in the proportion of farms engaged in other business activities stopped, which corresponds with forecasts.

4 Publication and dissemination

Preliminary data from the 2007 Farm Structure Survey were published on IC/MAF's website www.mmmtike.fi in April 2008. The final data were published in August 2008. The results were published as both a press release and an issue of the e-Tiketti magazine. The key results for horticultural enterprises were published in the 2007 Horticultural Enterprise Register.

Previous farm structure surveys were conducted in 1995, 1997, 2000, 2003 and 2005. The labour force data from the 2005 Farm Structure Study as well as data on machinery and equipment were published in the Agricultural Statistical Bulletin series. A publication dealing with farms' other business activities was prepared in cooperation with MTT Agrifood Research Finland. The data on horticultural enterprises were published in the 2005 Horticultural Enterprise Register, as was done again in 2007.



25.8.2008

Esa Katajamäki

The 2003 data were published in Eurojyvä and the 2000 data were published in Agricultural Census 2000 and other publications. Besides published reports, data on farm structure statistics are available on the IC/MAF website <http://www.mmtike.fi> and on the Matilda information service website <http://matilda.mmm.fi>. Data on the farm labour force of other EU countries are available on Eurostat's website (http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1090,1&_dad=portal&_schema=PORTAL).

Besides publications and tables published on the Internet, farm-specific data from the Farm Structure Survey can be made available for research purposes. The release of individual-level data always requires IC/MAF's approval.



25.8.2008

Annexes

- Annex 1: Questionnaire

