

TECHNICAL REPORT

Final report on implementation of the action:

Reduction of response burden by replacing survey questions with register data: Cases of crop rotation, non-regular non-family labour, and number of pigs, sheep and goats

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1. Introduction

Administrative and other registers contain data that may be useful when compiling statistics. Common advantages of agricultural register use are the almost total coverage of farms and the avoidance of misinterpretations by farmers when answering questionnaires. Developed techniques of data transfer and processing offer new possibilities for the utilization of registers. In this project some new ways of register use were investigated and developed.

The work involved mainly researchers and statisticians working in the Statistical Services unit of the Natural Resources Institute Finland (Luke), which is the statistical authority responsible for most of the agricultural statistics in Finland, such as the Farm Structure Survey (FSS) and farm animal statistics.

The project was active between 7 October 2015 and 6 April 2017.

2. Crop rotation

2.1 Background

There was a question about crop rotation in the Survey of Agricultural Production Methods (SAPM) in 2010 and in the Farm Structure Survey (FSS) of 2016. In the SAPM it was difficult to find a clear definition for crop rotation, that would be easy to transform into a simple and unambiguous question of a farm survey. As an alternative for farm surveys, the field parcel register of the Integrated Administration and Control System (IACS) was considered a potential source of information on crop rotation on individual farms that could be used in the FSS of 2016.

2.2 IACS field parcel data

The IACS field parcel data obtained from the Finnish Agency for Rural Affairs (Mavi) has been used as a source of annual cultivated area of crops for crop statistics and for FSS. However, the cultivation history of individual parcels has not been investigated in this connection.

In this project, data available to help track cultivation history of a parcel over several years was screened. Specifically the use of the new geospatial data collected from farmers by the farm subsidy administration available from the year 2015 on was checked out. A project was compiled for the SAS-EG[®] software, that calculates the area where the same crop has been cultivated over several consecutive years.

At the first stage, register data was compared with the crop rotation data collected in the SAPM in the year 2010, whereby a calculation procedure was developed and the usefulness of the data was evaluated. At the second stage, register data from the year 2016 was used in the calculation of the corresponding variable for FSS 2016.

In the analysis, cultivation was considered monoculture, if the same crop was grown on the same location for three consecutive years. For the SAPM these years were 2008–2010 and for the FSS 2016 they were 2014–2016. Only those crop species were taken into account that were considered to have negative effects when grown continuously. These crops included cereals, potato, sugar beet, oil seed crops, pulses, vegetables and strawberry.

The most important crops that were considered acceptable as monoculture were grassland species, greenhouse crops, apple, and berries other than strawberry. These crops were excluded from the calculation of monoculture area.

2.3 Use of geospatial data

When applying for agricultural subsidies, farmers must indicate the location of their field parcels and the location of individual crops within the parcels. In recent years, almost all farmers have adopted the possibility of drawing the location of their crops electronically on the internet service offered by the Finnish Agency for Rural Affairs. In 2016, about 90% percent of Finnish farmers used the internet service for the application of subsidies.

The geospatial data of crop location are entered in the database as Oracle[®] SDO_GEOMETRY data. The geospatial data can be processed with Oracle[®] SQL Developer program using the subprograms available for the processing of geospatial data. Oracle subprogram SDO_GEOM.SDO_INTERSECTION is used to form a new geometry object that is the intersection of the locations of a crop within a single parcel in consecutive years. Then the area of the intersection is calculated with the subprogram SDO_GEOM.SDO_AREA. This indicates the area within the parcel in question where same crop was grown in two consecutive years. To extend the scrutiny to a third consecutive year when the same crop has been grown on the same parcel, an intersection is formed of the intersection of the first two years and the same crop's location of the third year. This new intersection indicates the area where the same crop has been grown in all three consecutive years.

The analysis is carried out with Oracle SQL Developer program because the geospatial data of the type SDO_GEOMETRY cannot be processed with SAS-EG software that is otherwise used for data processing. At present, SAS Corporation is considering the inclusion of SDO_GEOMETRY in the types of data that can be accessed with SAS/ACCESS to Oracle.

2.4 Process of the determination of monoculture area

1. Parcels that have only one and the same crop on the whole parcel in the first two years.

a) Parcels that have only one and the same aforementioned crop on the whole area also in the third year. → Monoculture area = The whole area of the parcel

b) Parcels that have the same aforementioned crop in the third year too, but with at least one additional crop. → Monoculture area = The area of the third year

2. Parcels that have the same crop in the first two years with at least one other crop in one of the two years.

a) Parcels that have only one and the same aforementioned crop on the whole area in the third year, too. → Monoculture area = Smaller of the areas of the first two years

b) Parcels that have the same aforementioned crop in the third year too, but with at least one additional crop. → Geospatial analysis for the last year's crop location and the crop's location of the year when several crops were grown on the parcel in question.

3. Parcels that have the same crop in the first two years with at least one other crop in both of the two years.

a) Parcels that have only one and the same aforementioned crop on the whole area in the third year, too. → Geospatial analysis: Intersection of the first two years is the area of the same crop for all three years.

b) Parcels that have the same aforementioned crop in the third year too, but with at least one additional crop. → Geospatial analysis for the last year's crop location and the intersection of the first two years.

Mass analysis of geospatial data is yet to be developed. So far, the respective phases of the data analysis (2b and 3) have been replaced with the assumption that half of the potential monoculture area has actually been under monoculture. In the cases where the area of a crop within the same parcel has varied less than 5% during the period of three consecutive years, the location of the crop is assumed having been constant and the whole area is considered monoculture. The cases where the analysis of geospatial data is necessary represent only a minor portion (18%) of the total area under monoculture and, therefore, they don't have a significant effect on the total area (Table 1). Comparison of crop areas between the years 2014 and 2015 must in any case be carried out by using the aforementioned assumptions, because there are very few farms that have geospatial data for the year 2014.

In 2016, monoculture area totalled 289,532 ha which is 12% of total field area. Farm specific portion of monoculture area ranged from 0% to 100%. About half of the farms had no monoculture area at all.

Table 1. Cases, where the same crop has been grown on the same parcel in three consecutive years (2014-2016) with or without other crops.

Type of monoculture on a parcel	Monoculture area, ha
Only one and the same crop in three consecutive years	209 544
Only one and the same crop in two of the three consecutive years	28 364
Only one and the same crop in one of the three consecutive years	11 533
Several crops in all of the three consecutive years	40 090

2.5 Comparison of IACS parcel data and SAPM survey data of 2010

Farm specific monoculture area for the years 2008–2010 was calculated from IACS parcel data with the method described above (Section 2.4) and was compared with the data from the SAPM. In the survey, permanent grassland was excluded from the potential monoculture crops, but temporary grassland was included. Results below indicate that with the inclusion of temporary grassland, monoculture area calculated from IACS data is close to that obtained from the SAPM (Table 2). However, in the calculation of monoculture area for the FSS 2016, both permanent and temporary grassland were excluded, because they were not considered to have a negative effect when grown in monoculture.

Table 2. Monoculture area of the SAPM sample farms calculated from IACS field parcel data compared with the monoculture area of SAPM survey.

	Number of farms with monoculture area according to IACS	Total monoculture area, ha	
		IACS field parcel data	SAPM
Temporary grassland not included	4 533	73 557	96 843
included	5 801	125 831	121 698

2.6 Sustainability of the results

In the future, the developed calculation method will be used in the production of crop rotation characteristics for farm statistics. Besides the analysis of monoculture area, it is possible to use the method and the geospatial data of field parcels for a broader analysis of crop rotation by tracking any defined sequence of different crops. The potential enhancement in the use of geospatial data, for example through an access to the data by SAS-EG, may enable the execution of the analysis using solely the geospatial data that indicates the location of individual crop species within field parcels.

3. Farm relief workers' amount of work

3.1 Background

Pursuant to recently adopted legislation, the data on farm relief workers' working hours will be received from the Finnish Farmers' Social Insurance Institution (Mela) for compilation of statistics. The individual-level data is investigated and linked with individual identifiers (personal ID) from persons to individual farms. This would enable the calculation of the amount of farm relief work by a farm as a part of the FSS variable "non-family labour employed on a non-regular basis".

At the first stage, register data was compared with the earlier FSS data for the year 2013, whereby a calculation procedure was developed and the usefulness of the data was evaluated. At the second stage, register data from the year 2016 was used in the calculation of the corresponding variables for FSS 2016.

3.2 Comparison of Mela data and FSS 2013 data

Farm relief workers' amount of work (part of the FSS variable 4.01.05 "Non-family labour employed on a non-regular basis") was received from the Finnish Farmers' Social Insurance Institution (Mela) that records the amount of work of the relief workers, who work on farms mainly during the legal holidays of the farmers.

The data from Mela's register was compared with that from the survey of FSS 2013. 79% of the farms that submitted the use of farm relief workers in the FSS had data with farm ID in Mela's register. Many of those farms that did not have farm ID in Mela, could be identified using other data (e.g. personal ID, address). In the future, Mela will urge the local authorities to record the farm ID

together with the data on relief workers. Informing the collector of the data about the way the data is used helps the collector to compile the data into a more useful form.

A closer comparison was carried out for those FSS 2013 sample farms that had their farm ID in Mela data. The number of these farms was 5,149 which is 29% of the whole sample. The total amount of relief workers' work on these farms in 2013 was 1,196 AWU according to FSS 2013 and 1,426 AWU according to Mela's data. Closer comparison of farm specific data is presented in Table 3.

3.3 Calculation the relief workers' amount of work for the FSS 2016

Calculation of the farm relief workers' amount of work for FSS 2016 sample farms resulted in a total of 1,685 AWU divided on 6,385 farms, which is 40% of the whole sample. Almost 94% of the amount of work was carried out on animal farms. This an expected result, because animals demand daily attention, which results in a large amount of work.

3.4 Sustainability of the results

It was concluded that Mela's data can be used to calculate farm relief workers' amount of work in the FSS 2016 and in the future statistics. Mela's data contained farmers' personal ID, but some data lacked farm ID. In these cases IACS was an essential tool providing the connection between personal IDs of farmers and farm IDs.

It is likely that Mela's data gives more correct values than farm surveys, because Mela's data should effectively cover all farms that have used publicly supported relief workers. The work of the relief workers that are not included in Mela's register will be collected in farm surveys in the future, too.

Table 3. Comparison of relief workers' amount of work from Mela's register and from FSS 2013 data collection from farms (FSS 2013 sample farms that had used relief workers and had farm ID in Mela's register).

	Number of farms
Mela > FSS 2013, total	3,195
Mela > FSS 2013, difference >50%	759
Mela > FSS 2013, difference >25% - 50%	983
Mela > FSS 2013, difference >10% - 25%	839
Mela > FSS 2013, difference ≤10%	614
FSS 2013 > Mela, total	1,901
FSS 2013 > Mela, difference >50%	331
FSS 2013 > Mela, difference >25% - 50%	508
FSS 2013 > Mela, difference >10% - 25%	534
FSS 2013 > Mela, difference ≤10%	528
Mela and FSS 2013 exactly the same	53
Some hours in Mela's data, but no hours in FSS 2013	583

4. Feasibility of pig, sheep and goat registers to replace collection of farm-level animal data

4.1 Background

The target of this project was to develop statistical tools for using the animal register information as reliable statistical information. The aim of these actions was to significantly reduce the response burden and improve the efficiency of agricultural statistics. The focus of the project was on national information systems, but results and recommendations can be generalised to other member states that have similar animal registers.

In Finland, the number of pigs was included in the subsidy application form in IACS until 2014. Thereby, IACS was the main source of the data for the number of pigs in FSS. In addition, the number of pigs in December had been collected by an annual sample survey given to pig farmers. However, since year 2015 the farm-level information about pigs has no longer been included in the IACS. To avoid the direct data collection from farms, an alternative potential auxiliary data source for pig statistics is the pig register.

The main reasons for the reduced usability of the pig register have been the incomplete coverage and the inconsistency in classifications. In the pig register, pigs are classified by age, whereas in the animal statistics of the European Statistical System (ESS) the required classification is by weight.

The objective of the project was to build a statistical model where pig statistics could be exploited as reliable auxiliary information at the farm level using the administrative pig register. Thus, the yearly pig survey in December could be closed down, and there would be no need to include the number of pigs in the FSS questionnaire.

The sheep and goat register has already been used as an administrative source for animal statistics. However, the quality of this data source is not very good. Especially, in some cases it takes a long time before changes in animal numbers are reported and entered into the register. In the project, the quality of the administrative sheep and goat register was evaluated and the process of estimating the number of sheep and goats from the register was improved.

4.2 Use of administrative registers in livestock statistics

In Finland, administrative registers are already relatively extensively used in livestock statistics. Current registers include a cattle register, a pig register, a sheep and goat register, a dairy register and the IACS. This project involved studying whether more extensive use of the sheep and goat register and the pig register could be made in statistics, thereby reducing farmers' and slaughterhouses' reporting obligations. The quality and scope of the pig register and the sheep and goat register were also studied.

In Finland, agricultural subsidies account for a significant proportion of farmers' earnings, and all notable farms with agricultural production apply for agricultural subsidies. Controls on agricultural subsidies also include monitoring the timeliness and comprehensiveness of the registering of

farms' livestock and the accuracy of the register data. Subsidies may be cut and sanctions imposed on farmers if their data are not up to date. Consequently the data held in livestock registers are mostly reliable and cover all animals. Delays in the updating of some registers have nevertheless been a problem from the perspective of statistics.

4.3 Pig register

4.3.1 Legislative basis of the pig register

Identification and registration of pigs is based the following laws, among others:

- The Act on the Animal Identification System
- Decree of the Ministry of Agriculture and Forestry on Pig Identification 720/2012
- Council Directive 2008/71/EC on the identification and registration of pigs

4.3.2 Tagging and registering pigs

Pigs must be marked at their holding of birth with either a tattoo or an eartag. The marking must be made by latest before the animal is moved or given to another holding. The producer must not move unmarked pigs from the farm and an animal supplier, slaughterhouse or an animal transporter must not accept them. Farmers can obtain a tagging ID by registering as a keeper of pigs with the municipal authority responsible for rural activities.

Buying, selling and transfer events of pigs and animal population data must be delivered to the pig register.

Animal population reports on pigs must be delivered to the pig register three times a year; in May (January – April), in September (May – August) and in January of the following year (September – December).

Monthly animal population data shows the number of animals on the first day of each month. Pigs are reported to the register in the following categories:

- Boars 8 months and over
- Sows 8 months and over
- Young breeding pigs over 3 months – under 8 months
- Fattening pigs over 3 months – under 8 months
- Piglets 3 months and under

Events and numbers of animals can be reported via an online application, on a paper form or over the telephone to customer services.

4.4 Use of pig register data in statistics

4.4.1 Statistics on the number of pigs

Statistics on the number of pigs are compiled twice a year and reported according to the situation on 1 April and 1 December. The number reported for 1 April is based on information pulled from

the pig register, and the numbers are published according to a classification based on the ages of pigs in the pig register nationally and regionally.

Until the year 2014, the number of pigs reported for 1 April was based on a questionnaire sent to farmers in connection with their subsidy applications and could be taken from the IACS. Since 2015, the number of pigs reported for 1 April has been based on information pulled from the pig register. Not having to report the number of their pigs during the same period to two different places has reduced farmers' reporting obligations considerably.

The number of pigs reported for 1 December is based on a sample survey conducted among farmers in December/January. The information is collected according to the categories stipulated in an EU Regulation (Regulation (EC) No 1165/2008 of the European Parliament and of the Council concerning livestock and meat statistics) and reported to Eurostat by mid-February.

4.4.2 Use of the pig register in EU statistics

The pig register is currently a relatively reliable source of information for statistics on numbers. Delays in the updating of the register data and their scope have been a problem previously. Although there are still delays, they are not significant enough to have a detrimental effect on statistics.

The biggest problem in using the data held in the pig register in EU statistics lies in the fact that the categorisation used in the pig register and that used in the statistics supplied to the EU are different.

The number of pigs as of December each year must be reported to Eurostat according to weight-based categories, while the data in the pig register are categorised according to age. Moreover, Eurostat's categorisation of sows and fattening pigs is relatively detailed in the annual statistics.

The number of pigs established in connection with farm structure surveys that are carried out every three or four years must also be reported to Eurostat according to weight-based categories. The categorisation of pigs in this context is considerably less detailed than in the annual statistics. The aim is to begin producing the information on the number of pigs for these Eurostat statistics on the basis of the pig register in the future.

4.4.3 Conversion of the pig register's age-based categories into weight-based categories

The project also aimed to study how the number of pigs reported for 1 April (categorised according to age) could be converted into weight-based categories and to produce a computational model for the conversion.

Until now, the numbers reported for 1 April have been pulled from the IACS, which uses the same weight-based categories as the farm structure surveys (Table 4). This source of information is no longer available, which is why the number of pigs by age group (on 1 April) must be converted into the weight-based categories stipulated by Eurostat computationally.

Table 4. The categorisation used in the farm structure surveys and the categorisation used in the pig register.

Number of pigs in farm structure surveys	Number of pigs in the pig register
Sows of 50 kg or more	Sows of 8 months or more
Piglets of less than 20 kg	Piglets of 3 months or less
Other pigs	Young breeding pigs of more than 3 months but less than 8 months
	Fattening pigs of more than 3 months but less than 8 months
	Boars of 8 months or more

The project involved comparing the number of pigs on each farm on 1 April according to the pig register (categorised according to age) against the numbers reported by farms for the same date on the basis of weight in their subsidy applications each spring between 2012 and 2014.

The comparison revealed that, on average, pigs could be divided into the categories stipulated by Eurostat according to Table 5. For example, Eurostat's category for sows of 50 kg or more would include all sows of 8 months or more and 70% of young breeding pigs.

Table 5. Categories used in farm structure surveys and their equivalents in the pig register (in blue)

Sows of 50 kg or more includes
- Sows of 8 months or more (all)
- Young breeding pigs of more than 3 months but less than 8 months (70%)
Piglets of less than 20 kg includes
- Piglets of 3 months or less (70%)
Other pigs includes
- Fattening pigs of more than 3 months but less than 8 months (all)
- Boars of 8 months or more (all)
- Piglets of 3 months or less (30%)
- Young breeding pigs of more than 3 months but less than 8 months (30%)

On average in the last five years, the number of pigs has been divided into the different categories according to Table 6. If necessary, this percentage split can also be used to convert the age-based categorisation of pigs into weight-based categories.

Table 6. Division of the number of pigs into weight categories.

Species	Percentage of all pigs
Sows of 50 kg or more	10
Piglets of less than 20 kg	29
Other pigs	61

4.4.4 Sustainability of the results

It was found feasible to calculate pig numbers for FSS classified according to weight from the register numbers classified according to age. This method will be used in the future to obtain farm specific pig numbers for FSS or Statistics on Agricultural Input and Output (SAIO).

For now, information on the number of pigs in December is collected from farmers by means of sample surveys that use a weight-based categorisation according to Regulation (EC) No 1165/2008. It was found difficult to convert the numbers of pigs reported in the pig register into these categories that are more detailed than those of the FSS.

If Eurostat's categorisation of pigs were based on age, the pig register could be used more extensively in quantitative statistics and it would not be necessary to ask farmers for their numbers separately. It might also perhaps be easier for farmers to report pigs according to age groups than weight-based categories.

Categorisation in pig register is based on the needs of administration and it will not change according to Regulation (EC) No 1165/2008. Change of categorisation in pig register would increase burden of farmers heavily. It would be easier and cost effective to produce statistics, if categorisation was not so detailed in the regulation.

4.5 Sheep and goat register

4.5.1 Legislative basis of the sheep and goat register

The sheep and goat register is maintained by the Finnish Food Safety Authority Evira.

Tagging and registering sheep and goats is based on European Council Regulation (EC) No 21/2004 establishing a system for the identification and registration of ovine and caprine animals and amending Regulation (EC) No 1782/2003 and Directives 92/102/EEC and 64/432/EEC, and the Act on the Animal Identification System (238/2010).

The publicity and disclosure of information and documents in the Agency for Rural Affairs' Rural Business Administration's registers are determined in the Act on the Openness of Government Activities (621/1999) and, when relevant, the Personal Data Act (523/1999). The law on the Agency for Rural Affairs' Rural Business Administration's information systems (284/2008) also governs the use of the sheep and goat register and the disclosure of information.

4.5.2 Tagging and registering sheep and goats

The sheep and goat authority register is maintained using the sheep and goat register. Events that are reported to the register include population reports, births, purchases, removals and transfers between holdings. All sheep and goat animals must be reported to the register regardless of their purpose of use.

Each sheep and goat is tagged with two Evira approved eartags. The tags must be attached within six (6) months of birth and always before the animal is transported away from its birth holding. Keepers of animals report their animals either electronically or with a paper form.

The report must be made on the seventh (7) day after the event at the latest. An exception is the birth notification of an individual (birthing notification of the mother), which is used to report which EU ID its offspring is registered and tagged with. Animals must be registered within six months of birth (182,5 days), but if the animal is transported from its birth holding before that age it must be registered and tagged before being transported.

4.5.3 Supervision

Supervision of tagging and registering is primarily supervision that takes place on-site, where registering as a sheep and/or goat animal keeper and holding, tagging and registering sheep/goats, reporting events to the register and the animal record and list of free tag IDs kept at the holding are checked.

Failure to follow sheep and goat tagging and registering legislation will lead to penalties for the keeper of animals, and the severity of punishment depends on the gravity of the neglect. Failure to follow provisions may lead to financial consequences for the keeper of animals relating to complementary conditions of EU subsidy systems, or even criminal sanctions.

4.6 Use of sheep and goat register data in statistics

4.6.1 Register information used for statistics

The sheep and goat register essentially contains all sheep and goats in Finland. Therefore, there is extensive information available for each sheep and goat for statistical purposes. The following indicators are collected from the sheep and goat register for statistics and categorisations in statistics:

- Farm ID/Customer ID
- Gender
- Time of birth
- Birthing data (ID of the mother given in the birth notice, for information that the sheep/goat in question has given birth)
- Purpose of use
- Date of slaughter (sold for slaughter, slaughtered on farm)
- Export date (sheep/goat transported abroad)
- Date of killing
- Date of death
- Slaughterhouse ID
- Slaughter weight

Based on these indicators sheep and goats can be categorised into the desired categories in the sheep and goat population statistics.

4.6.2 Use of the sheep and goat register in statistics on the number of livestock

Statistics on the numbers of sheep and goats are compiled once a year nationally and regionally. The number of sheep and goats in Finland is below the threshold stipulated in the Regulation, which is why Finland does not need to report the numbers of sheep and goats to Eurostat annually. The information is, however, also reported to Eurostat in connection with the farm structure surveys carried out every three or four years. The statistics are based on the sheep and goat register, which is very comprehensive and of good quality.

Nationally, statistics on sheep are categorised as ewes, other sheep and all sheep. Ewes include female sheep that have already lambed, and “other sheep” include other female and male sheep of all ages. Statistics on goats simply state the total number of goats. Estimation of sheep and goat numbers was improved by excluding the animals that were declared as pets.

The statistics produced do not include those farms in the sheep and goat register that are not included in the register on agricultural and horticultural enterprises, i.e. farms with annual standard output (SO) less than 2,000 €.

A copy is taken of the sheep and goat register in November that shows the numbers of sheep and goats on 1 May, and the statistics are based on the copy taken of the register in November showing the situation on 1 May. Taking the copy more than six months after the reporting date ensures that all the sheep and goats in existence on the reporting date have been included in the register. Sheep and goat farmers have six months to report births to the register.

The sheep and goat register can be considered a reliable source of information for statistics on the numbers of sheep and goats, as checks are made in connection with controls relating to agricultural subsidies, for example, to ensure that all animals are reported to the register on time and that the register entries concerning each animal are correct.

4.6.3 Use of the sheep and goat register in meat production statistics

The sheep and goat register also contains information about the date on which each animal is slaughtered and the animal's weight, which means that the register can be used as a source of information on slaughtered sheep and lambs (numbers and weights). Slaughterhouses have an obligation to report their slaughter volumes to the register within seven days of each slaughter. The information can be supplied via an online application, on a paper form or over the telephone. The data that slaughterhouses need to report to the sheep and goat register include, among others, each animal's identity code, the date on which the animal was slaughtered and the animal's weight, and information can be pulled from the register for statistical purposes on that basis.

The quality of the slaughter data held in the register was studied by comparing the numbers of slaughtered sheep shown for each slaughterhouse in the register against the figures reported by slaughterhouses for meat production statistics in their monthly reporting forms (questionnaires). The numbers of slaughtered animals in the register differed to some extent from the data collected directly from slaughterhouses (Table 7). For the most part, the register showed higher numbers and weights than what the slaughterhouses had reported.

Data for each previous month are pulled from the register at the end of the following month. The register is not updated quite in real time, which is why monthly statistics on the numbers of sheep and goats slaughtered during previous months are updated a few times a year.

Table 7. Numbers and weights of sheep slaughtered in 2016 according to the sheep and goat register and the figures reported by slaughterhouses during the same period in their questionnaires.

Month	Number of sheep slaughtered in 2016		Number of sheep slaughtered in 2016			
	Questionnaire		Sheep and goat register		Difference Register - Questionnaire	
	qty	kg	qty	kg	qty	kg
1	4,702	93,766	4,903	99,792	201	6,026
2	6,935	137,470	6,711	133,701	-224	-3,769
3	8,381	161,110	9,390	180,452	1,009	19,342
4	3,709	73,778	3,983	79,819	274	6,041
5	3,091	61,445	3,311	65,840	220	4,395
6	2,338	48,601	2,297	47,847	-41	-754
7	1,518	32,912	1,574	33,862	56	950
8	4,140	89,406	4,416	92,028	276	2,622
9	6,771	135,802	7,311	147,700	540	11,898
10	8,640	174,929	8,917	181,158	277	6,229
11	9,319	187,601	9,219	187,880	-100	279
12	3,614	72,969	3,618	72,860	4	-109
Total	63,158	1,269,789	65,650	1,322,939	2,492	53,150

The sheep and goat register can be considered a relatively reliable source of statistical information for meat production statistics. The register has shown higher numbers of slaughtered animals than the figures collected directly from slaughterhouses on the basis of questionnaires. It would appear that the information reported by slaughterhouses directly does not include all slaughtered sheep. Moreover, it is possible that not all slaughterhouses that slaughter sheep and goats answer the questionnaires. New slaughterhouses are not automatically included in the list of slaughterhouses to which the questionnaire is sent straight away. Slaughter data taken from the sheep and goat register, on the other hand, are more likely to show all slaughtered sheep and goats in statistics.

Using the sheep and goat register as the source of monthly meat production statistics reduces slaughterhouses' reporting obligations considerably and saves the cost of questionnaires.

The register could also be used to pull information on the numbers of sheep slaughtered on farms. However, the reliability of these data is not certain, which is why the reliability and comprehensiveness of the data still need to be studied more.

4.6.4 Sustainability of the results

It was observed that the quality of sheep and goat register data has improved in recent years. The register is now better up-to-date than before. The quality of register data was considered sufficient for use in the production of the numbers of sheep and goats and will be used for this purpose in the future. Slaughter numbers and slaughter weights of sheep and goats are based on data from sheep and goat register since January 2017. Collection of sheep and goat slaughterings data from slaughterhouses is not necessary anymore.