

Farm Structure Survey 2009/2010  
Survey on agricultural production  
methods 2009/2010

**National Methodological Report (NMR)**

According to Art. 12 of Regulation (EC) No 1166/2008 of the European Parliament and of the Council of 19 November 2008 published in the Official Journal of the European Union L 321, p.14 of 1 December 2008

Member State: Danmark

# **FARM STRUCTURE SURVEY 2009/2010 SURVEY ON AGRICULTURAL PRODUCTION METHODS 2009/2010 NATIONAL METHODOLOGICAL REPORT**

## **CONTENTS**

### **SUMMARY**

- 1. CONTACTS**
  - 2. SURVEY METHODOLOGY**
    - 2.1 National legislation
    - 2.2 Characteristics and reference period
    - 2.3 Survey organisation
    - 2.4 Calendar (overview of work progress)
    - 2.5 Population and frame
    - 2.6 Survey design
    - 2.7 Sampling, data collection and data entry
      - 2.7.1 Drawing the sample –for SAPM and/or OGA, if applicable
      - 2.7.2 Data collection and data entry
      - 2.7.3 Use of administrative data sources
    - 2.8 Specific topics
      - 2.8.1 Common Land
      - 2.8.2 Geographical reference of the holding
      - 2.8.3 Volume of water used for irrigation
      - 2.8.4 Other issues
    - 2.9 Response-burden policy
  - 3. ACCURACY AND RELIABILITY OF THE DATA COLLECTED**
    - 3.1 Data processing, analysis and estimation
      - 3.1.1 Estimation and sampling errors – for SAPM and/or OGA, if applicable
      - 3.1.2 Non sampling errors ( )
      - 3.1.3 Methods for handling missing or incorrect data items
      - 3.1.4 Control of the data
    - 3.2 Evaluation of results
    - 3.3 Data Revision Policy
  - 4. ACCESSIBILITY AND PUNCTUALITY**
    - 4.1 Publications
    - 4.2 Timeliness and Punctuality
  - 5. CONFIDENTIALITY AND SECURITY**
- REFERENCES**
- ANNEXES**
- ENDNOTES**

## **SUMMARY**

The summary should focus on the survey methodology. The main topics to be dealt with are:

- A brief history of the FSS - this item is of special interest for countries with less experience in FSS surveys. In these cases it will be useful to make a short description also about the related statistical activities – i.e. establishment/up-date of statistical register, etc.
- Survey period
- Coverage
- Survey organisation
- Work process
- Preparing the survey operations
- Data collection and data entry
- Data processing, estimation and analysis
- Whether sampling for SAPM and/or for OGA is applied and respect of the precision requirements

### **History of FSS:**

In its present form the agricultural and horticultural survey goes back to 1977 where the separate surveys for agriculture and horticulture were integrated in one survey.

Since then the survey has taken place every year as a questionnaire based survey where the farmer has received a questionnaire in a letter with an obligation to complete it.

The questionnaire has varied year after year, partly to meet EU requirements, and partly to meet national needs. The questionnaire has thereby never been completely identical two successive years.

Furthermore the survey has changed between total censuses and sample surveys:

The following surveys have been total censuses: 1977-83, 1985, 1987, 1989, 1999 and 2010.

The following surveys have been sample surveys: 1984, 1986, 1988, 1990-98, 2000-09 and 2011-12.

The next total census will presumably be held in 2019 or 2020.

Generally the sample has been quite big with a participation of about 20-35 per cent of all holdings, in 2003, 2005 and 2007 even about 50 per cent.

The surveys have always had a threshold so that small holdings are excluded from the survey. This threshold has currently been revised through the years:

1977-82: The surveys included all holdings with at least 0,5 hectares or at least a production with a value corresponding to 0,5 hectares with barley.

1983-1994: The surveys included all holdings with at least 5,0 hectares or at least at standard gross margin of 3.000 euros at 1985 prices.

1995-2009: The surveys included all holdings with at least 5,0 hectares or at least a standard gross margin of 4.000 euros at 1990 or 1995 prices.

From 2010 Eurostat introduced in co-operation with the EU member states a harmonization of the thresholds for inclusion of holdings in the survey. These thresholds are described in regulation 1166/2008 in Annex II. They are minimum requirements which could be complemented by more strict national requirements. Hereafter Statistics Denmark includes all holdings which fulfil just one of the following criteria:

- 1) An agricultural area of at least 5,0 hectares
- 2) A standard output of at least 7.500 euros
- 3) Fruits, berries and nursery area of at least 0,5 hectares
- 4) Vegetables and strawberries of at least 0,5 hectares
- 5) Greenhouse and mushrooms of at least 1.000 m<sup>3</sup>
- 6) At least 10 cattle
- 7) At least 50 pigs
- 8) At least 10 sows
- 9) At least 20 sheep
- 10) At least 20 goats
- 11) At least 1.000 poultries
- 12) At least 40 fur animals

From 2010 Statistics Denmark has included holdings with fur animals in the agricultural and horticultural survey.

In the first many years it was the rule that all survey variables were collected as questions on the questionnaire. The farmer informed for instance that he cultivated 10,7 hectares with winter wheat, had 25 dairy cows, 2 horses etc.

However, from 1996 onwards, Statistics Denmark decided to remove most of the questions on crops having the intention to collect the same information from the new system of crop subsidies where information on crops became stored in the General Agricultural Register (GLR). In English this register is known as the Integrated Agricultural Control System, IACS. IACS has all the time been kept by the Ministry of Agriculture, which yearly has delivered a sample of the register to Statistics Denmark.

In the first years it was still necessary to have some crops on the questionnaire, for instance horticulture and potatoes which were not specified in IACS. The standard in IACS has, however, been improved so in 2009 Statistics Denmark could remove the remaining crops from the questionnaire.

The approach has right from the beginning been as described here: The farmer has on the questionnaire answered if he has applied for crop subsidies and if yes he should only give information on a limited set of crops or none at all. If no he should give a complete specification of all crops. For each holding having answered yes Statistics Denmark has found the information on crops in IACS. The result has been a survey register with complete information on all holdings as if all the questions had been on the questionnaire in the traditional way.

From 2005 onwards the system of crop subsidies has been changed to a single payment system, but the farmers still have to specify their crops, so the change has not had any impact on IACS as a statistical source.

In 2001 Statistics Denmark introduced a somewhat similar system for information on cattle. Since then the farmers have simply answered if they have cattle, and for farms having answered yes the number of cattle has been collected from The Central Livestock Register and the cattle register.

Likewise the question on fur animals introduced in 2010 is a yes/no question, however, the number of fur animals is not collected from The Central Livestock Register but from a register from The Danish Association of fur animals farmers.

### **Survey period:**

The FSS was held in 2010 and the SAPM survey in 2011 as a sample survey.

### **Coverage:**

The FSS and the SAPM survey covered all holding above the survey threshold specified in annex 2 of Regulation 1166/2008.

### **Survey organisation**

The surveys are conducted by Statistics Denmark in the division of agricultural statistics.

### **Work process:**

The practical work of preparing the questionnaire began in the autumn 2009 and preparing of the population took place in the beginning of 2010. All the practical survey work took place from the summer 2010 till the spring 2012.

### **Preparing the survey operations**

Nothing to remark

### **Data collection and data entry**

The surveys are based on postal questionnaire, but telephone interviews and Internet questionnaire are also used to a limited extent.

### **Data processing, estimation and analysis**

All the individual survey information is checked; both manually and by means of computer based validation routines.

### **Whether sampling for SAPM and/or for OGA is applied and respect of the precision requirements**

The OGA questions are included in FSS 2010 exactly like all other FSS questions. The SAPM characteristics are covered by a sample survey held in 2011.

## 1. CONTACTS

Contact organisation	Danmarks Statistik
Contact organisation unit	Division on agricultural statistics
Contact name	Danmarks Statistik
Contact person function	Danmarks Statistik
Contact mail address	Sejrøgade 2100 København Ø 11
Contact email address	<a href="mailto:dst@dst.dk">dst@dst.dk</a>
Contact phone number	+ 45 39 17 39 17

## 2. SURVEY METHODOLOGY

### 2.1 National legislation

- Law on Statistics Denmark puts an obligation on all business units, including agricultural farms, to complete questionnaires. Likewise all government institutions must send their administrative data to Statistics Denmark on request.

### 2.2 Characteristics and reference period

In Denmark we conducted a total census of all agricultural farms in 2010 and a sample survey in 2011 covering all SAPM characteristics. The 2011 survey also had questions on livestock and crops but no other traditional FSS questions.

There are no sections on the two questionnaires with questions collected exclusively for national reasons but in certain cases some details exist not required by the regulation. In the following certain examples are given:

Crops: The Danish survey collects information on winter crops and spring crops for wheat, barley and rape.

Pigs: There are 10 categories of pigs where the regulation demands 3 categories only.

Cattle: There are 12 categories of cattle where the regulation only requires 7.

Poultry: There 8 categories on the Danish questionnaire where the regulation requires only 3.

Fur animals: The Danish questionnaire has from 2010 onwards had a question on fur animals where the regulation only requires a yes/no question on “other animals.

Other animals: For sheep, goats, horses, rabbits and bee hives the Danish questionnaire is identical with the regulation requirements.

The following characteristics are not collected at all but are considered as non-significant or non-existing:

### List of Danish NE & NS characteristics FSS 2010 and SAPM 2011

Characteristics code	Status	Name of characteristic	Explanation
A_3_1_3	NE	Agricultural area utilised for shared farming or other modes	Shared areas do not exist in Denmark. An area will always be owned or rented by somebody, and this somebody is the farmer whether being a natural or a legal person.
A_3_2_3_4	NS	Organic farming - sugar beet	In 2008 only one farm had 1,8 hectares with sugar beets under conversion to organic farming.
A_3_2_3_9	NE	Organic farming - citrus fruit	Not grown for climatic reasons
A_3_2_3_10	NE	Organic farming – olives	Not grown for climatic reasons
A_3_2_3_11	NE	Organic farming – vineyards	Though it might not be completely impossible in theory to grow organic vine in Denmark no organic farmer has ever reported to the Ministry of Agriculture that he grows vine.
A_3_3_1	NS	More than 50% of production self-consumed by the holder	Farms which produce agricultural products for own consumption do not exist to any considerable extent in the North Western part of Europe.
B_1_1_2	NE	Durum wheat	Not grown for climatic reasons
B_1_1_7	NE	Rice	Not grown for climatic reasons
B_1_6_1	NE	Tobacco	Not grown for climatic reasons
B_1_6_2	NE	Hops	Not grown for climatic reasons
B_1_6_3	NE	Cotton	Not grown for climatic reasons
B_1_6_5	NS	Sunflower	Only 23 hectares in 2009 (IACS)
B_1_6_6	NS	Soya	Only 29 hectares in 2009 (IACS)
B_1_6_8	NS	Other oil seed crops	The only “other oil seed crop” which can be identified in IACS 2009 is turnip rape with 16 hectares
B_1_6_9	NS	Flax	Only 26 hectares in 2009 (IACS)
B_1_6_11	Significant	Other textile crops	133 hectares in 2009 (IACS). Denmark would be willing to remove this crop from the NS list if Eurostat agrees.
B_1_6_99	NS	Industrial plants not mentioned elsewhere	No “other industrial plants” can be found in IACS.
B_1_9_2_2	NS	Forage plants - other green fodder - leguminous plants	Only 31 hectares in 2009 (IACS)
B_2	NS	Kitchen gardens	Kitchen gardens are of no importance among farms producing for the market.
B_4_1_1_2	NE	Fruit species of subtropical climate zones	Not grown for climatic reasons
B_4_1_3	NS	Nuts	Only 13 hectares in 2009 (IACS)
B_4_2	NE	Citrus plantations	Not grown for climatic reasons
B_4_3	NE	Olive plantations – total	Not grown for climatic reasons
B_4_3_1	NE	Olive plantations - table olives	Not grown for climatic reasons
B_4_3_2	NE	Olive plantations - oil production	Not grown for climatic reasons
B_4_4	NS	Vineyards – total	Only 27 hectares with wine grapes in 2009 (IACS)
B_4_4_1	NS	Vineyards - quality wine	-
B_4_4_2	NS	Vineyards - other wines	-
B_4_4_3	NS	Vineyards - table grapes	-

B_4_4_4	NS	Vineyards – raisins	-
B_6_3_1	NE	Energy crops on set-aside area	The set aside obligation is abolished in 2008
B_6_4	NE	Genetically modified crops	Not allowed in Denmark
D_2_1_4	NE	Equipment for energy production: hydro-energy	For natural reasons – absence of moving rivers – hydro-energy is not possible in Denmark.
F_1_5	NS	Other gainful activity: wood processing	Both wood processing and aqua culture were covered by the Danish FSS survey in 1998. Result: Wood processing: 11 farms, extrapolated 38 farms Aqua culture: 15 farms, extrapolated 35 farms
F_1_6	NS	Other gainful activity: aqua culture	A more recent analysis of the Danish business register shows that only 14 agricultural units also have aqua culture (NACE 32.1000 and 32.20000) and only 15 agricultural units have also wood processing (NACE 16-17.0000).
G_1_4	NE	Rural development support: Community standards	Does not exist in Denmark according to the Ministry of Agriculture
G_1_6	NE	Rural development support: Natura 2000 payments	Does not exist in Denmark according to the Ministry of Agriculture
G_1_7	NE	Rural development support: payments under Water framework directive	Does not exist in Denmark according to the Ministry of Agriculture
G_1_9	NE	Rural development support: Animal welfare payments	Does not exist in Denmark according to the Ministry of Agriculture
M_3_2_C	NE	Linear elements established: stone walls	According to Danish experts stone walls are no longer established at Danish farms
M_4_2_1	NE	Common land grazing: Number of animals	Impossible since common land (A_3_1_3) is assumed not to exist
M_4_2_2	NE	Common land grazing: Number of months with animals outdoors	Impossible since common land (A_3_1_3) is assumed not to exist
M_8_1_2_8	NS	Area irrigated in the previous 12 months: sunflower	Follows from having declared B_1_6_5 NS
M_8_1_2_14	NE	Area irrigated in the previous 12 months: citrus plantations	Follows from having declared B_4_2 NE
M_8_1_2_15	NE	Area irrigated in the previous 12 months: olive plantations	Follows from having declared B_4_3 NE
M_8_1_2_16	NS	Area irrigated in the previous 12 months: vineyards	Follows from having declared B_4_4 NS
M_8_2_1	NE	Irrigation method: Surface irrigation	Such method of irrigation does evidently not exist in Denmark
M_8_3_9	NE	Source of water: other sources	No other methods of irrigation taking place in Denmark can be identified.

The survey day of the FSS 2010 was Friday May 14. This survey date concerns all characteristics which meaningfully can be assigned to one specific day. This is first and foremost the case for livestock. For some other characteristics other principles apply:

- Crops are collected from IACS where farmers should apply for crop subsidies no later than April 16 2010. For green house crops and farms not applying for subsidies the survey day applies.
- Cattle are collected from the livestock register dated June 1 2010, pretty close to May 14.
- Labour force characteristics, including other gainful activities concern a period of one year prior to the survey data rather than the survey day itself.
- Rural development characteristics concern the calendar year 2008-2010. According to art 8.(d) this reference period should be 3 years.
- Education in the recent year concerns necessarily a period of one year prior to the survey day.

The SAPM survey took place in 2011 with a survey day of Friday July 2011 but also here far from all characteristics can be said to belong to one specific day:

Tillage methods and manure application concern the season 2010. On the questionnaire the text says translated into English “Cultivation methods in 2010”. It is extremely likely, however, that the farmer would understand that as the most recent crop year going from sowing of winter seed in October 2009 to the harvest in August-September 2010.

- Irrigation is linked to the land use of the FSS 2010.



- Animal housing is linked to the livestock but a farm without animals on the survey day can still have stables for pigs, cattle or poultries.
- Soil cover concerns 2010 or the farmer's understanding of the most recent crop year.  
The four soil cover characteristics are in fact collected from IACS 2010. IACS 2010 concerns the crop year 2010, which in practice means the period from sowing the winter crops in October 2009 to harvesting in August-September 2010.
- Share of Arable Land out of crop rotation is calculated from IACS 2011, 2010 and 2009
- Grazing on the holding concerns the conditions in the recent season prior to the survey day.

When designing the two questionnaires we have used the handbook on definitions, rev. 8 June 5 2010. It should be noticed that we have had a close dialogue with Swedish and British colleagues.

### **2.3 Survey organisation**

All survey work has been done by Statistics Denmark in the division of agriculture. 3 persons have devoted almost all of their work time on the two surveys. 8 colleagues have worked part time on FSS and SAPM and a few other colleagues have been involved with less than about 20 hours of work, for instance with design of the questionnaire.

### **2.4 Calendar (overview of work progress)**

- Autumn 2009: First discussions on the questionnaire.
- January-April 2010: Preparation of the register, the farm register was integrated in the general business register.
- April 2010: Final preparation the questionnaire both on paper and the Internet.
- May 2010: Preparation of the population.
- July 7 2010: 52.206 questionnaires are sent to the farmers.
- August 6 2010: First reminder sent to 13.098 farmers.
- September 10 2010: Second reminder sent to 7.251 farmers
- October 8 2010: Third reminder sent to 4.023 farmers.
- December 2010-February 2011: Last reminder, telephone call to 2.800 farmers
- July 2010-March 2011: Validation and control of questionnaires.
- April 2011: Integration of questionnaire data with data from IACS and livestock register
- May 2011: Final validation and control of results.
- June 8 2011: Publication of the census in a small newsletter and on the web.

The work progress is almost identical for the SAPM survey, which took place one year later.

- Autumn 2010: First discussions on the questionnaire, the discussion continues till the spring 2011 where the questionnaire is finally prepared.
- June 2011: Preparation of the population and selection of the sample:
- June 25 2011: Letters and questionnaires are sent to the farmers.
- July 1 2011: Survey day.
- August 5 2011: First reminder sent to 7.066 farmers.
- August 26 2011: Second reminder sent to 3.951 farmers.
- August 29 2011: Third reminder sent to 2.371 farmers.
- September-November 2011: Telephone reminder, 1.500 farmers
- August 2011-February 2012: Validation and control of questionnaires.

- March 2012: Integration of questionnaire data with data from IACS and livestock register
- April-May 2011: Final validation and control of results.
- June 6 2012: Publication of the census in a small newsletter and on the web.

## **2.5 Population and frame**

- **Population**

The population of all agricultural farms was prepared in the following way:

Until early 2010 Statistics Denmark still kept an independent farm register. It was decided in 2009 that the farm register should be integrated in the business register. All farms from the farm registers were transferred to the business register in the spring 2010. Normal match procedures were used like business number, personal code, address and certain manual procedures for problem farms. Where no corresponding business unit could be found to farm a new unit was created as a pure agricultural unit with no business number. The register information is currently tested when farms take part in agricultural surveys of different kinds- FSS, pig survey, harvest surveys and others – though the test as such is not the primary aim. It might sometimes lead to that units in the business register are deleted as active farms if they have stopped all agricultural activities.

All these farms were given the status “active in agriculture”.

Afterwards all farms defined as business register units active in agriculture were all big farms were selected. In this context “big” means “big enough to be included in the FSS according the regulation criteria”.

- A) Big farms fulfil at least one of these criteria:
  - 1) An agricultural area of at least 5,0 hectares
  - 2) A standard output of at least 7.500 euros
  - 3) Fruits, berries and nursery area of at least 0,5 hectares
  - 4) Vegetables and strawberries of at least 0,5 hectares
  - 5) Greenhouse and mushrooms of at least 1.000 m<sup>3</sup>
  - 6) At least 10 cattle
  - 7) At least 50 pigs
  - 8) At least 10 sows
  - 9) At least 20 sheep
  - 10) At least 20 goats
  - 11) At least 1.000 poultries
  - 12) At least 40 fur animals

The source was for every farm the most recent information from a farm structure survey.

- B) Units in the business register with a NACE code in agriculture, including fur animals, and with a minimum turnover of 30.000 Danish kroner.
- C) Small according to survey information mentioned under A but big according to register information. This exercise is explained in details below.

At this stage of the updating – before taking C) into account - we had all in all 23.802 small farms according to the most recent survey information, which could be any farm structure survey up to the 2009 survey. Had we simply trusted this survey information we would not have selected any of these small farms in the total farm structure census 2010. However we checked the status as “small farm” against area information from IACS and livestock information from the livestock register.

The idea was that if one or both of these two sources would contradict the status as small for a farm we would include the concerned farm in the farm structure census 2010. It could for example be that IACS said “at least 5,0 hectares” or that the livestock register said “at least 10 cattle”. This exercise meant that 832 farms changed their status from “small” to “big” and were selected to the farm structure survey 2010 with this result:

Big according to 2010 survey information	439
Small according to 2010 survey information	271
Closed down farms	122

The 439 farms proved still to be big when having completed the FSS questionnaire and were included in the national publication and the farms sent to Eurostat. 271 farms had decreased their farm activity so that they again became small.

All big farms were hereafter selected to take part in the census, all in all 52.206 farms. Had the C) exercise not been carried through the number would have been  $52.206 - 832 = 51.374$ .

In 2006 Statistics Denmark carried through a project with grants called “Danish TAPAS project on” small units”. The study showed that Danish farms below the threshold have about 0,6 per cent of the total standard gross margin of the whole Danish agriculture. The work can be found on CircaB, see page 10.

Small farms in IACS 2010 have a relative share of the agricultural area of 1,2 percent where small are defined as farms

- 1) An agricultural smaller than 5,0 hectares.
- 2) An area with frits, berries and nursery smaller than 0,5 hectares.

- **Frame <sup>(1)</sup>**

The frame for the Danish FSS 2010 was the business register with all units marked as “active in agriculture” and with the status as “big” meaning big enough to be included in the farm structure statistics as described in 2.5.

## 2.6 Survey design

- Total census, including OGA.

---

<sup>(1)</sup> The *frame* is the listing or listings of units that delimit, identify, and allow access to the elements or sets of elements of the target population.

## 2.7 Sampling, data collection and data entry

### 2.7.1 Drawing the sample –for SAPM and/or OGA, if applicable

The SAPM was conducted as a sample survey of about one third of the farms included. The population was the 2010 census consisting of 42.099. Of these 15.005 were selected to a stratified sample survey.

The stratification falls into 2 dimensions:

The first dimension is the type of farming according to the farm typology:

- 1) All horticultural farms, group 2.1, 2.2, 2.3, 3.6 and 3.8 and other farms not belonging to any of these groups but having at least 50 per cent of standard output from horticultural crops.
- 2) Cereals, group 1.5
- 3) Other field crops, group 1.6
- 4) Dairy cows, group 4.5
- 5) Other cattle farms, group 4.6 and 4.7
- 6) Other grazing animals, group 4.8
- 7) Pig farms, group 5.1
- 8) Poultry farms, group 5.2.
- 9) Fur animals, group 5.4
- 10) Mixed field crops, group 6.1
- 11) Field crops and grazing livestock, group 8.3
- 12) Other farms, group 8.4

The second dimension is the size of farm by standard out at euros according to FSS 2010 divided into theses 28 groups:

- 1) < 5.000
- 2) 5.000- < 6.000
- 3) 6.000- < 7.000
- 4) 7.000- < 8.000
- 5) 8.000- < 9.000
- 6) 9.000- < 10.000
- 7) 10.000- < 12.500
- 8) 12.500- < 15.000
- 9) 15.000- < 17.500
- 10) 17.500- < 20.000
- 11) 20.000- < 25.000
- 12) 25.000- < 30.000
- 13) 30.000- < 40.000
- 14) 40.000- < 50.000
- 15) 50.000- < 75.000
- 16) 75.000- < 100.000
- 17) 100.000- < 125.000
- 18) 125.000- < 150.000
- 19) 150.000- < 200.000
- 20) 200.000- < 250.000
- 21) 250.000- < 300.000
- 22) 300.000- < 350.000
- 23) 350.000- < 400.000

- 24) 400.000- < 450.000
- 25) 450.000- < 500.000
- 26) 500.000- < 750.000
- 27) 750.000- < 1.000.000
- 28) >= 1.000.000

The strength of the standard output as a size measure is that it takes all agricultural activities into account by their economic importance.

The two tables below show number of farms by strata in respectively the population of 42.099 farms and the sample of 15.005 farms:

However, to avoid very thin strata some size groups have been merged in most the typology groups as shown in table below:

### Merged size groups in each typology group

---

Typology group	Groups being merged	Final size groups
1	None	All 28 groups
2	22+23 24+25+26 27+28	1) <= 5000 2) > 5.000-6.000 3) > 6.000-7.000 4) > 7.000-8.000 5) > 8.000-9.000 6) > 9.000-10.000 7) > 10.000-12.500 8) > 12.500-15.000 9) > 15.000-17.500 10) > 17.500-20.000 11) > 20.000-25.000 12) > 25.000-30.000 13) > 30.000-40.000 14) > 40.000-50.000 15) > 50.000-75.000 16) > 75.000-100.000 17) > 100.000-125.000 18) > 125.000-150.000 19) > 150.000-200.000 20) > 200.000-250.000 21) > 250.000-300.000 22) > 300.000-400.000 23) > 400.000-750.000 24) > 750.000
3	22+23 24+25+26 27+28	1) <= 5000 2) > 5.000-6.000 3) > 6.000-7.000 4) > 7.000-8.000 5) > 8.000-9.000 6) > 9.000-10.000 7) > 10.000-12.500 8) > 12.500-15.000 9) > 15.000-17.500 10) > 17.500-20.000 11) > 20.000-25.000 12) > 25.000-30.000 13) > 30.000-40.000 14) > 40.000-50.000 15) > 50.000-75.000 16) > 75.000-100.000 17) > 100.000-125.000 18) > 125.000-150.000 19) > 150.000-200.000

---

		20) > 200.000-250.000
		21) > 250.000-300.000
		22) > 300.000-400.000
		23) > 400.000-750.000
		24) > 750.000
4	1-18	1) <= 150.000
		2) > 150.000-200.000
		3) > 200.000-250.000
		4) > 250.000-300.000
		5) > 300.000-350.000
		6) > 350.000-400.000
		7) > 400.000-450.000
		8) > 450.000-500.000
		9) > 500.000-750.000
		> 10) 750.000-1.000.000
		> 11) > 1.000.000
5	18+19 20+21 22-25 26-28	1) <= 5.000
		2) > 5.000-6.000
		3) > 6.000-7.000
		4) > 7.000-8.000
		5) > 8.000-9.000
		6) > 9.000-10.000
		7) > 10.000-12.500
		8) > 12.500-15.000
		9) > 15.000-17.500
		10) > 17.500-20.000
		11) > 20.000-25.000
		12) > 25.000-30.000
		13) > 30.000-40.000
		14) > 40.000-50.000
		15) > 50.000-75.000
		16) > 75.000-100.000
		17) > 100.000-125.000
		18) > 125.000-200.000
		19) > 200.000-300.000
		20) > 300.000-500.000
		21) > 500.000
6	16-28	1) <= 5.000
		2) > 5.000-6.000
		3) > 6.000-7.000
		4) > 7.000-8.000
		5) > 8.000-9.000
		6) > 9.000-10.000
		7) > 10.000-12.500
		8) > 12.500-15.000
		9) > 15.000-17.500
		10) > 17.500-20.000
		11) > 20.000-25.000
		12) > 25.000-30.000
		13) > 30.000-40.000
		14) > 40.000-50.000
		15) > 50.000-75.000
		16) > 75.000
7	1-18	1) <= 150.000
		2) > 150.000-200.000
		3) > 200.000-250.000
		4) > 250.000-300.000
		5) > 300.000-350.000
		6) > 350.000-400.000
		7) > 400.000-450.000
		8) > 450.000-500.000
		9) > 500.000-750.000
		10) > 750.000-1.000.000
		11) > 1.000.000
8	1-18	1) <= 150.000

9	19-22	2) > 150.000-350.000
	23-26	3) > 350.000-750.000
	27-28	4) > 750.000
	1-18	1) <= 150.000
10		2) > 150.000-200.000
		3) > 200.000-250.000
		4) > 250.000-300.000
		5) > 300.000-350.000
		6) > 350.000-400.000
		7) > 400.000-450.000
		8) > 450.000-500.000
		9) > 500.000-750.000
		10) > 750.000-1.000.000
		11) > 1.000.000
		1) <= 5.000
11	2-18	2) > 5.000-150.000
	19-22	3) > 150.000-350.000
	23-26	4) > 350.000-750.000
	27-28	5) > 750.000
12	19-22	1) <= 5.000
	23-26	2) > 5.000-6.000
	27-28	3) > 6.000-7.000
		4) > 7.000-8.000
		5) > 8.000-9.000
		6) > 9.000-10.000
		7) > 10.000-12.500
		8) > 12.500-15.000
		9) > 15.000-17.500
		10) > 17.500-20.000
		11) > 20.000-25.000
		12) > 25.000-30.000
		13) > 30.000-40.000
		14) > 40.000-50.000
		15) > 50.000-75.000
	16) > 75.000-100.000	
	17) > 100.000 < 125.000	
	18) > 125.000 < 150.000	
	19) > 150.000 < 350.000	
	20) > 350.000 < 750.000	
	21) > 750.000	
12	1-18	1) <= 150.000
	19-22	2) > 150.000-350.000
	23-26	3) > 350.000-750.000
	27-28	4) > 750.000

In this way the number of strata has been reduced to 180.

The table below shows number of farms in the population and the sample for each stratum:

## Number of farms in the population and the in Danish SAPM survey 2011

Stratum *	Population	Sample	Stratum	Population	Sample	Stratum	Population	Sample
0101	32	19	0309	250	16	0613	221	33
0102	4	2	0310	203	11	0614	108	20
0103	18	8	0311	318	24	0615	118	37
0104	13	10	0312	243	25	0616	97	92
0105	18	11	0313	375	46	0701	161	33
0106	21	17	0314	264	34	0702	95	34
0107	51	36	0315	452	95	0703	106	44
0108	44	31	0316	264	73	0704	122	66
0109	46	29	0317	203	62	0705	122	118
0110	36	25	0318	142	61	0706	104	101
0111	74	56	0319	191	100	0707	126	122
0112	46	38	0320	136	128	0708	122	114
0113	95	82	0321	86	78	0709	496	469
0114	70	55	0322	113	106	0710	447	428
0115	139	121	0323	158	144	0711	1399	1331
0116	79	69	0324	68	65	0801	178	60
0117	79	64	0401	358	124	0802	56	55
0118	78	68	0402	238	90	0803	48	48
0119	104	95	0403	251	119	0804	81	80
0120	79	74	0404	274	161	0901	353	173
0121	93	85	0405	222	217	0902	145	63
0122	52	45	0406	199	193	0903	153	87
0123	66	55	0407	283	279	0904	118	95
0124	39	36	0408	305	296	0905	111	91
0125	37	32	0409	1044	1014	0906	95	80
0126	136	123	0410	386	374	0907	65	55
0127	90	81	0411	314	292	0908	48	42
0128	197	174	0501	129	6	0909	163	148
0201	456	13	0502	79	3	0910	59	50
0202	405	11	0503	97	5	0911	61	52
0203	392	10	0504	156	10	1001	259	6
0204	356	9	0505	121	7	1002	125	32
0205	325	9	0506	148	10	1003	31	29
0206	355	10	0507	341	25	1004	14	14
0207	786	23	0508	300	25	1005	6	6
0208	730	27	0509	266	25	1101	28	3
0209	673	29	0510	213	20	1102	50	3
0210	576	31	0511	350	43	1103	81	4
0211	966	52	0512	275	44	1104	86	1
0212	821	58	0513	370	73	1105	99	5
0213	1092	103	0514	247	62	1106	102	4
0214	793	93	0515	341	122	1107	213	14
0215	1079	176	0516	186	101	1108	190	16
0216	572	123	0517	110	106	1109	163	15
0217	326	98	0518	163	159	1110	163	16
0218	232	79	0519	105	103	1111	293	34
0219	260	98	0520	62	58	1112	223	30
0220	128	60	0521	32	29	1113	347	61
0221	103	56	0601	535	11	1114	215	48
0222	125	117	0602	203	6	1115	370	111
0223	108	102	0603	217	7	1116	198	86
0224	18	18	0604	239	8	1117	103	56
0301	1435	29	0605	266	9	1118	60	58
0302	293	6	0606	221	8	1119	155	153
0303	262	7	0607	487	24	1120	37	35
0304	231	8	0608	384	26	1121	10	10
0305	209	6	0609	309	21	1201	412	190
0306	201	6	0610	229	19	1202	261	252
0307	385	14	0611	300	29	1203	253	246
0308	284	13	0612	227	28	1204	113	109

\* The first two digits are the typology code and the next two are the size groups, for instance stratum 0407 represents farms in typology group 4 and size group 07.



Please provide information in the following tables:

NUTS2 regions with more than 10.000 holdings

Crop characteristics:

Precision requirements	Field codes	NUTS2 regions			
		Region Syddanmark	Region Midtjylland		
Number of holdings in the NUTS2 region		11 734	12 841		
UAA, ha of the NUTS2 region	A_3_1	787 858	791 783		
Area of cereals in ha in the NUTS2 region	B_1_1	407 765	4483 11		
% Cereals in the UAA of the NUTS2 region		51,8	56,6		
Area of potatoes and sugar beet in ha in the NUTS2 region	B_1_3 + B_1_4	11 569	18 390		
% potatoes and sugar beet in the UAA of the NUTS2 region		1,5	2,3		
Area of oilseed crops in ha in the NUTS2 region	B_1_6_4 + B_1_6_5 + B_1_6_6 + B_1_6_7 + B_1_6_8	48 239	43 562		
% oilseed crops in the UAA of the NUTS2 region		6,1	5,5		
Area of permanent outdoor crops in ha in the NUTS2 region	B_4 - B_4_7	9 124	8 570		
% permanent outdoor crops in the UAA of the NUTS2 region		1,2	1,1		
Area of fresh vegetables, melons, strawberries, flowers in ha in the NUTS2 region	B_1_7 + B_1_8	3 050	3 513		
% fresh vegetables, melons, strawberries, flowers in the UAA of the NUTS2 region		0,4	0,4		
Area of temporary grass and permanent grassland in ha in the NUTS2 region	B_1_9_1 + B_3	170 422	161 046		
% temporary grass and permanent grassland in the UAA of the NUTS2 region		21,6	20,3		

Livestock characteristics:

Precision requirements		Field codes	NUTS2 regions			
			Region Syddanmark	Region Midtjylland		
LSU in the NUTS2 region						
all animals (all Bovine ages)	Number of Bovine animals in the NUTS2 region, in LSU	$C_{2\_1} \cdot 0.4 + C_{2\_2} \cdot 0.7 + C_{2\_3} \cdot 0.7 + C_{2\_4} + C_{2\_5} \cdot 0.8 + C_{2\_6} + C_{2\_99} \cdot 0.8$	437 883	352 025		
	% of the LSU in the NUTS2 region		27,8	21,3		
	% of national share of bovine animals in LSU		38,6	31		
Sheep and goats (all ages)	Number of Sheep and goats in the NUTS2 region, in LSU	$C_{3\_1} \cdot 0.1 + C_{3\_2} \cdot 0.1$	5 729	4 243		
	% of the LSU in the NUTS2 region		0,4	0,3		
	% of national share of sheep and goats in LSU		33,2	24,6		
Pigs	Number of Pigs in the NUTS2 region, in LSU	$C_{4\_1} \cdot 0.027 + C_{4\_2} \cdot 0.5 + C_{4\_99} \cdot 0.3$	1 051 682	1 241 377		
	% of the LSU in the NUTS2 region		66,8	75,2		
	% of national share of pigs in LSU		29,9	35,3		
Poultry	Number of Poultry in the NUTS2 region, in LSU	$C_{5\_1} \cdot 0.007 + C_{5\_2} \cdot 0.014 + C_{5\_3} \cdot 0.030$	78 681	53 044		
	% of the LSU in the NUTS2 region		5	3,2		
	% of national share of poultry in LSU		38,5	26		

NUTS2 regions with less than 10000 holdings and Denmark  
Crop characteristics:

	Precision requirements	Field codes	NUTS2 regions			
			Region Hovedstaden	Region Sjælland	Region Nordjylland	All Danmark
1	Number of holdings in the NUTS2 region		2 290	7 114	8 120	42 099
2	UAA, ha of the associated NUTS1 region	A_3_1	98 558	477 769	490 897	2 646 864
3	Area of cereals in ha in the associated NUTS1 region with at least 1000 holdings	B_1_1	54 002	289 998	269 092	1 469 168
4	Area of potatoes and sugar beet in ha in the associated NUTS1 region with at least 1000 holdings	B_1_3 + B_1_4	590	40 684	5 980	77 213
5	Area of oilseed crops in ha in the associated NUTS1 region with at least 1000 holdings	B_1_6_4 + B_1_6_5 + B_1_6_6 + B_1_6_7 + B_1_6_8	8 583	38 927	25 586	164 898
6	Area of permanent outdoor crops in ha in the associated NUTS1 region with at least 1000 holdings	B_4 - B_4_7	813	5 328	3 867	27 702
7	Area of fresh vegetables, melons, strawberries, flowers in ha in the NUTS2 region	B_1_7 + B_1_8	498	4 752	581	12 394
8	Area of temporary grass and permanent grassland in ha in the associated NUTS1 region with at least 1000 holdings	B_1_9_1 + B_3	24 290	50 786	114 229	520 773

Livestock characteristics:

Precision requirements		NUTS2 regions				
		Region Hovedstaden	Region Sjælland	Region Nordjylland	All Danmark	
Precision requirements		Field codes				
LSU in the associated NUTS1 region						
Bovine (all ages)	Number of Bovine animals in the associated NUTS1 region with at least 1000 holdings, in LSU	$C_{2\_1} \cdot 0.4 + C_{2\_2} \cdot 0.7 + C_{2\_3} \cdot 0.7 + C_{2\_4} + C_{2\_5} \cdot 0.8 + C_{2\_6} + C_{2\_99} \cdot 0.8$	21 653	56 002	266 479	1 134 042
Sheep and goats (all ages)	Number of Sheep and goats in the associated NUTS1 region with at least 1000 holdings, in LSU	$C_{3\_1} \cdot 0.1 + C_{3\_2} \cdot 0.1$	1 682	3 363	2 247	17 263
Pigs	Number of Pigs in the associated NUTS1 region with at least 1000 holdings, in LSU	$C_{4\_1} \cdot 0.027 + C_{4\_2} \cdot 0.5 + C_{4\_99} \cdot 0.3$	81 263	366 661	774 994	3 515 977
Poultry	Number of Poultry in the associated NUTS1 region with at least 1000 holdings, in LSU	$C_{5\_1} \cdot 0.007 + C_{5\_2} \cdot 0.014 + C_{5\_3} \cdot 0.030$	2 885	21 997	47 709	204 317

### 2.7.2 Data collection and data entry

- For both FSS 2010 and SAPM 2011 we have used a postal paper questionnaire which also was available on the Internet for farmers having a digital signature connected to their business number. Such a business signature should not be confused with a personal digital signature.
- Data entry modes: Please give information about the data entry methods applied. For example:

	Internet	By post, questionnaire scanned	By post, questionnaire registered manually	By phone, questionnaire registered manually
<b>FSS 2010</b>	<b>1.300</b>	<b>35.300</b>	<b>10.600</b>	<b>5.000</b>
<b>SAPM 2011</b>	<b>1.800</b>	<b>10.400</b>	<b>800</b>	<b>2.000</b>

Comments: For both the FSS 2010 and SAPM 2011 we encouraged the farmers to use the Internet but with limited success. The reason is that few farmers have a digital business signature and could not see any reason to order one just to please Statistics Denmark. The normal way to complete the questionnaire is to fill in the paper version and return it to Statistics Denmark in a PP envelope. In some cases it is not possible to scan the questionnaire successfully due to poor hand writing, questionnaire partly torn to pieces etc. Questionnaires for non-active farms having

closed down all agricultural activities are not scanned either. Finally also when farmers have completed the questionnaire on the phone scanning cannot be used since the scanner cannot recognize the hand written identification number.

All farms are checked whether the questionnaire is scanned or registered manually. The validation can be divided into two groups:

- Warning checks to detect possible mistakes, for instance more than 30 horses. It is not necessarily a mistake but most likely it is.
- Logical mistakes. It could be no working time indicated by the farmer or not all parts on the section of irrigation have been completed.

### 2.7.3 Use of administrative data sources

IACS is used as the source for collecting information crops, more specifically the following characteristics:

In practice an applicant of agricultural subsidies is almost always identical to a farm in statistical sense. In few cases – in total less than 50 – an applicant might have two or more different farms. It is the case for some government institutions. When receiving a questionnaire such a farm must complete it as if it had not applied for subsidies at all, see below.

The crop information from IACS is linked to the single farm in the FSS. Farms which do not apply for subsidies must give a full specification of all crops. It is thus not a problem that IACS is not complete. Approximately 5 per cent of the farms do not apply for crop subsidies.

Code	Name		Code	Name
A_3_1_2	Agricultural area utilised for farming by tenant		B_1_7_1_1	Fresh vegetables, melons, strawberries - outdoor - open field
B_1_1_1	Common wheat and spelt		B_1_7_1_2	Fresh vegetables, melons, strawberries - outdoor – market gardening
B_1_1_3	Rye		B_1_8_1	Flowers – outdoor
B_1_1_4	Barley		B_1_9_1	Forage plants - temporary grass
B_1_1_5	Oats		B_1_9_2_1	Forage plants - other green fodder - green maize
B_1_1_6	Grain maize		B_1_9_2_99	Forage plants - other green fodder - other than green maize and leguminous
B_1_1_99	Other cereals		B_1_10	Seeds and seedlings
B_1_2_1	Peas, field beans and sweet lupines		B_1_11	Other arable land crops
B_1_2_2	Pulses other than peas, field beans and sweet lupines		B_1_12_1	Fallow land without subsidies
B_1_3	Potatoes		B_1_12_2	Fallow land subject to payment of subsidies with no economic use
B_1_4	Sugar beet		B_3_1	Permanent grassland and meadow - pasture and meadow
B_1_5	Fodder roots and brassicas		B_3_2	Permanent grassland and meadow - rough grazing
B_1_6_4	Rape and turnip		B_3_3	Permanent grassland and meadow - no used for production
B_1_6_7	Linseed (oil flax)		B_4_1_2	Berry species
B_1_6_10	Hemp		B_4_5	Nurseries
B_1_6_12	Aromatic, medicinal and culinary plants		B_5_2_1	Wooded area - with short rotation

M_2_1_1	Soil cover: normal winter crop	M_2_1_3	Soil cover: plant residues
M_2_1_2	Soil cover: cover or intermediate crop	M_2_1_4	Soil cover: bare soil

On the questionnaire the farmers is asked if he has applied for subsidies this year, and if yes he also indicates his number in the subsidy system. It is a unique number which has no use anywhere else. In cases where a farmer forgets to indicate the number it is most often available

from the survey the previous year or the number can be found in other ways, for instance using match criteria like business number or personal codes.

If a farm answers “no, I do not apply for subsidies” it has to give a full specification of all crops.

All farmers applying for subsidies have to report their agricultural land to the Ministry of Agriculture. The land use must be specified at an extremely detailed level so that for instance the characteristic B\_1\_10 Seeds and seedlings consists of all in all 41 different IACS crops. In some other cases there is one to one relation, for instance B\_1\_4 sugar beets and B\_1\_5 fodder beets. There are no short comings where the level of details in IACS cannot meet the FSS standard.

The IACS register is sent to Statics Denmark twice a year, first time July and next time in January. There is no difference in the standard of the two versions, but some mistakes in the applications might have been corrected in the meantime. The Ministry of Agriculture states that after January very few corrections are made. The first version is used to create a provisional statistics on crops, and the next version is linked to FSS so that all crops are connected to the individual farms as if the questions on crops had been on the questionnaire in the traditional way.

*The Livestock register:* Information on cattle is collected from the livestock register, more specifically these characteristics:

Code	Name		Code	Name
C_2_1	Bovine under one year old - total		C_2_5	Heifers, 2 years and older
C_2_2	Bovine under 2 years – males		C_2_6	Dairy cows
C_2_3	Bovine under 2 years – females		C_2_99	Bovine 2 years old and over - other cows
C_2_4	Bovine 2 years and older – males			

A somewhere similar method is used as the one used for crops collected from IACS: All farmers in the survey are asked if they have cattle and if yes they must specify one or more numbers in the livestock register in order to create a match.

It is assumed as an impossible situation that a farmer could have cattle without being included in the livestock register since it is strictly illegal in Denmark. The information from the livestock register is transferred to FSS – again exactly as if the questions on cattle had been on the questionnaire.

*Rural development support:* These characteristics are collected from the Ministry of Agriculture:

Code	Name		Code	Name
G_1_2	Rural development support: modernisation		G_1_8_1	Rural development support: Agri-environment payments for organic farming
G_1_3	Rural development support: adding value to products		G_1_10	Rural development support: Diversification into non-agricultural activities
G_1_5	Rural development support: Food quality scheme		G_1_11	Rural development support: Encouragement of tourism
G_1_8	Rural development support: Agri-environment payments			

FSS 2010 is linked to the register from the Ministry of agriculture by using business by means of the business number and the personal code.

*Share of arable area out of planned crop rotation, M\_2\_2\_1:* This characteristic is collected from IACS 2008, 2009 and 2010. The farmers report the crops to the ministry when they apply for

subsidies, not only for the farm as a whole but for the single field on the farm. If the crop is the same for the one field all three years the area in 2010 is assumed to be area out of planned crop rotation. If a farm is not included in IACS in both 2008, 2009 and 2010 a donor farm is used having about the same size of area.

*Percentage of the total produced manure exported from the holding, M\_6\_3:* All farmers using livestock manure have to report their use of manure to the Ministry of agriculture in the so-called fertilizer accounts. Among other details they also report the total use of manure in the recent season and the export of manure, both items measured at kg N.

The match between FSS 2010 and the fertilizer register is obtained by means of the business number. If a match cannot be obtained a donor farm is found having about the same number of livestock units. However, farms with no livestock and no agricultural area, for instance greenhouse farms, are assumed to have no use of fertilizers.

It should be noticed that Statistics Denmark had planned also to collect information on animal housing from administrative sources. However, after having had consultations with the Ministry of Agriculture it could not be justified that the administrative information was sufficient as a statistical source. So we chose to have animal housing as normal questions on the questionnaire.

- Information on the characteristic (or on group of characteristics if they tightly related and coming from the same administrative source) IACS contains a huge number of crops where the standard is changed slightly from year to year. The 2010 standard had 268 different crops; in particular there are many categories of fruits, berries, vegetables and seeds for sowing. The list is available in Danish only.
  - any differences in the definition of the characteristic between the administrative source and the FSS : IACS reflects the crop year 2010, which means winter crops sown in the autumn 2009 and spring crops sown in the spring 2010. As such IACS is assumed to meet the FSS standard and thus no adjustment procedure is necessary.

The livestock register is delivered to Statistics Denmark with these 12 categories of cattle:

Bull-calves and steer-calves,- under 1/2 year

Bull-calves and steer-calves, 1/2-1 year

Bulls and bullocks, 1-2 years

Bulls and bullocks, 2 years and over

Heifer-calves, under 1/2 year

Heifer-calves, 1/2-1 year

Heifers, 1-2 years, in calf

Heifers, 1-2 years, not in calf

Heifers, 2 years and over, in calf

Heifers, 2 years and over, not in calf

Dairy cows

Cows kept for suckling

- reference date of used information : The farmers report their land use in April for the given crop year. If changes are made the farmers are obliged to report the changes. The crops might not have a survey day as such but does rather concern the season. In

2010 the farmers had a deadline of April 2010. It means that IACS 2010 had information on winter crops sown in the autumn 2010 and spring crops recently sown.

The procedure is that the farmer who applies for subsidies must write his number in IACS on the FSS questionnaire. Likewise a farmer with cattle must write his number in livestock register on the FSS questionnaire. These numbers are in the following called “register identification number”. If all farmers have indicated the correct identification number the match is easy and painless.

False matches are eliminated by using the following procedures, and they apply to both IACS and the livestock register:

- a) Two or more farms have indicated on the FSS questionnaire the same register identification number.
- b) A farm has indicated a non-existing identification number, probably a simple writing mistake.
- c) A farmer has not indicated any number.
- d) A farm has indicated an existing identification number, but neither the business number nor the personal civil registration code are the same in respectively the statistical register and IACS/livestock register. The farmer has most likely made a simple writing mistake and has accidentally chosen an existing number of a farm not included in the survey.

All these mistakes must be eliminated before the match can take place.

- Information on the method(s) of integration of the administrative data into the FSS:
  - inserted directly to the survey:  
The information from IACS and the livestock register is added to all farms in the survey having applied for single payment or having cattle. It means that the final output will be a survey register which also contains information on crops and cattle – *exactly as if the questions had been on the questionnaire in the traditional way.*
- limitations, drawbacks of the use of data from administrative source  
The Danish experiences cannot point to drawbacks as such. But besides the obvious challenges of securing correct and complete register information living up to the statistical standard there is also a purely practical dimension involved: It is of big importance to obtain a well-functioning co-operation with one or more administrative bodies so that the colleagues there know that they are obliged to assist the statistical office. It means both actually creating the necessary datasets and also a proper documentation of data.

## **2.8 Specific topics**

### **2.8.1 Common Land**

The legal change of the UAA concept, and also the fact that there are various possibilities for the coverage of the common land, makes this an obligatory chapter in the NMR for all the countries. It should include a brief description of the national situation of common land including:

In Denmark common land is assumed not to exist. All land is owned by somebody. In few cases an area of agricultural land could be owned by for instance a municipality and if so the person



who takes care of the land is assumed to be the manager. Common land has never been covered by a farm structure in Denmark.

## 2.8.2 Geographical reference of the holding

Please describe the method used to obtain the geo-reference of the holding.

The geo codes are collected from the Danish business register where they exist as a part of the address information.

The address is the head quarter of the farm. It could be identical to the farmer's private address but this is not necessarily so. The coordinates were sent to Eurostat unrounded to obtain the highest accuracy. In this way we also avoid absurd locations: In lakes, in the sea, in other NUTS3 regions and even in other countries.

**No grouping of holdings has taken place. Eurostat has identified 1.414 cases of farms with identical or almost identical geo codes. In rare cases two farms could in fact have the same address if for instance one man has the pig stable as his farm and another man cultivates the fields.** 2.8.3 Volume of water used for irrigation

Please describe the method used for the estimation of the volume of water used to irrigation on the holding (in m3).

Use of water for irrigation, characteristics M\_8\_4, is simply a question on the questionnaire like any other question.

However, we have realised that it should be considered as a difficult question and so we also expected that not all farmers with irrigation could answer the question on use of water. Out of 3.863 farms with irrigation in the SAPM survey 833 did not answer the question and so an imputation for these farms was necessary. It is worth noting that the majority of the farms in fact could answer the question so even though the question is difficult it might not be so more difficult than certain other SAPM questions.

The method of imputation was to find a donor among the farms who did answer the question. For this purpose the farms were divided into 3 groups:

- 1) Farms with no potatoes.
- 2) Farms with potatoes, but less than 50 pct. of the area.
- 3) Farms with potatoes on at least 50 pct. of the area.

The reason for taking potatoes into special considerations is that it is a key crop when talking about irrigation.

Among the non answer farms a donor was found randomly among farms having answered the question on use of water - a donor belonging to the same group 1), 2) or 3). And so the use of water was estimated as the share of water used for irrigation pr. hectare of irrigated area.

Example:

Farm A irrigates 30,0 hectares but does not inform about its use of water for irrigation.

Farm B irrigates 50 hectares of water and has used 42.000 m<sup>3</sup> of water.  
Farm B is randomly selected as a donor for A.  
Use of water for Farm A is thereby estimated as  $42.000/50*30=25.200$

#### 2.8.4 Other issues

- Any regional specification, ex. Extreme weather conditions in certain region(s) during the agricultural year (reference period) or differences in the methodology used in the collection phase
- Possible improvement in the future

When it comes to question on use of water it is absolutely necessary to accept “round figure” answers. Many farmers easily understand this but others do not feel comfortable about giving “incorrect” information. So the task of the interviewer and designer of the questionnaire with instructions is to encourage the farmers to give as good information as possible for questions where it is not realistic to demand strictly exact information.

## 2.9 Response-burden policy

Statistics Denmark insists on getting answers from all farms. It means that we only accept non response in obvious cases where for instance a farmer is seriously ill. Such cases account for less than 0.5 per cent of the selected farms to a survey or census.

After three written reminders we give the farmers a call and normally we can get the information immediately. However, a telephone based reminder procedure is very time consuming. Often we must make many calls in vain before we succeed in getting into touch with the farmer. It is also a critical measure in another way, namely that we so speak teach the farmers bad habits. “Why should I complete the questionnaire. Sooner or later they will call.” But on the other hand if we did not call the farmers we would in the end have many more police cases, which are even more time consuming and also unfavourable for the relationship between farmers and Statistics Denmark.

At all stages we encourage the farmers to call Statistics Denmark in case they have any problems with the questionnaire. In almost all cases when they call us it is possible to get the information in few minutes. The telephone contact is an important help to farmers having difficulties reading and understanding the logics of the questionnaire. And it is also a big advantage for us since we in this way get a questionnaire with complete information so no imputation or new contact with the farmers are necessary.

In the end it is unfortunately not possible to avoid police cases completely. The absolutely last reminder is a registered letter to farmers who still have not completed the questionnaire. Those who still do not react will be reported to the police. Normally they will get a fine of 800 Danish kroner (about 107 euros). At the FSS 2010 we had 10 police cases and in the SAPM 2011 we had 3.

### 3. ACCURACY AND RELIABILITY OF THE DATA COLLECTED

#### 3.1 Data processing, analysis and estimation

##### 3.1.1 Estimation and sampling errors – for SAPM and/or OGA, if applicable

- Identification of main sources of error

The main source of errors in the combined FSS/SAPM has been that farmers found the new SAPM questions difficult and that lead to certain amount of item non response as described below. It could be worth considering telephone interviewing; very often the personal contact helps the farmer. However, as a general method it is rather time consuming where the biggest problem is obtaining the contact rather the interview itself.

- Methods for deriving the extrapolation factor

- basic weight

The extrapolation factors for the SAPM survey 2011 are calculated based on the 42.099 farms in the total census 2010 and the 14.362 farms in the SAPM survey 2011. In each of the 180 stratas – see descriptions in passage 2.7.1 – the extrapolation factor is calculated as number of farms in the population – FSS 2010 – divided by number of farms in the population. It means that when it comes to number of farms by strata there is perfect consistency between FSS 2010 and SAPM 2011.

- Sampling errors

- The standard errors for the estimates are calculated using standard theory for finite population sampling. The estimation is model assisted and utilizes (in 2011) known marginal totals of farmland area and number of units. The actual calculations are done using CLAN software (courtesy of Statistics Sweden).

- RSE for selected crops and livestock by the five Danish NUTS2 regions, combined FSS and SAPM survey 2011.

	Region Hovedstaden	Region Sjælland	Region Syddanmark	Region Midtjylland	Region Nordjylland
Cereals	4,8	1,7	1,3	1,2	1,6
Pulses	19,7	9,2	7,7	6,8	14,9
Potatoes	18,3	5,7	2,9	1,9	2,0
Sugar beets	16,7	2,4	19,3	11,0	0,0
Oil seed crops	9,7	3,0	2,1	2,5	2,4
Vegetables and strawberries	7,0	3,2	2,2	2,3	2,4
Flowers	3,2	4,6	1,5	3,8	4,3
Plants harvested green	2,6	5,2	1,1	1,2	1,4
Grass permanent	6,5	3,9	1,5	1,7	1,6
Fruits and berries	5,9	2,2	5,5	2,2	6,6
Citrus	-	-	-	-	-
Olive	-	-	-	-	-
Vine	-	-	-	-	-
Dairy cows	2,7	2,3	0,4	0,7	0,7
Other cows	11,6	6,1	3,6	4,0	3,9
Other cattle	4,3	2,9	0,7	0,9	1,0
Sows	0,7	4,4	0,3	0,3	1,1

Other pigs	5,5	2,2	0,8	0,3	0,8
Sheep	18,1	13,1	8,5	10,4	20,4
Goats	70,3	29,1	19,2	7,0	8,7
Poultry	3,5	3,2	1,5	8,2	2,7

### 3.1.2 Non sampling errors (i)

- Coverage errors :The procedures for register updating applied prior to the survey and described in passage 2.5 are assumed to secure an almost perfect coverage. It is hardly likely that there could be any farm of importance:
  - a) Not included in IACS as an applicant of farm subsidies.
  - b) Not included in the livestock register with number of animals over the survey thresholds.
  - c) Not included in the business register with an agricultural NACE code.

Over coverage cannot occur because each farm has a unique number so even if the farmer would complete the questionnaire more than one time only one version could be registered.

- Measurement errors :During data editing the registration is subject to a number of warning signals like for instance: Is it really true that this farm has so many pigs? However, it is not possible to count number of farms having been subjects to these warning signals and how corrections they have caused.
- Non-response errors
  - Unit non-response:  
The unit non response is 0,5 per cent in 2011.
  - Item non-response:

In 2011 all in all 7.552 or it bit more than 50 per cent did not respond to at least one SAPM questions but completed the questionnaire otherwise. The text below describes in details the imputation methods.

Estimation methods regarding SAPM characteristics:

- 1) *Tillage methods, M\_1\_1, M\_1\_2 and M\_1\_3:*  
256 farms did not answer the questions. They were assumed to have conventional tillage only (M\_1\_1).
- 2) *Manure and slurry application: M\_6\_1\_1, M\_6\_1\_2, M\_6\_2\_1, M\_6\_2\_2:*  
2.235 farms did not the answer these questions. For each non response farm a donor was found among farms having answered the questions. The non response farm and the donor should have about the same size of agricultural area. These questions were foreseen to be difficult but after all the non response is no more than about 16 per cent.
- 3) *Storage facilities for solid dung and manure, M\_7\_1\_1, M\_7\_1\_2, M\_7\_1\_3\_1, M\_7\_1\_3\_2:*  
1.418 farms did not answer the questions. For these farms the following assumptions are made:  
*Big livestock farms* are assumed to have a slurry silo. (M\_7\_1\_3\_1 ). *Big livestock*

farms are defined as farms with at least 100 cattle, 1.000 pigs or 2.000 fur animals. *Medium sized livestock farms* are assumed to have storage facilities for solid dung (M\_7\_1\_1) and Storage facilities for liquid manure (M\_7\_1\_2). Medium sized livestock farms are defined as farms with cattle, pigs or fur animals but less than respectively 100, 1.000 and 2.000.

*Farms with at least 100 poultries* but no cattle, pigs and fur animals are assumed to have storage facilities for solid dung (M\_7\_1\_1).

*All other farms* are assumed to have no storage facilities for manure.

4) *Grazing livestock, M\_4\_1\_1 and M\_4\_1\_2:*

Farms with incomplete answers for these characteristics are divided into 3 groups:

4.a: Number of month are completed, but not area: There are 3 such farms so for them it is simply assumed that half of the grass land is used for grazing.

4.b: Area is completed, but not number of months: Out of 7.371 farms with cattle, sheep, goats and horses 87 could not answer the question on months. For these farms a random donor is selected among farms answered the question. The farms are divided into 3 groups according to whether cattle, sheep + goats or horses dominate at the farm.

4.c Neither area nor months are completed: There are 673 such farms. The same donor imputation procedure as for 5.b is used dividing the farms into cattle, sheep/goats and horses farms. The area for grazing is assumed to be half of grass land. For farms having no grass land - M\_4\_1\_1=0 – also months - M\_4\_1\_2 – are assumed to be zero.

All in all non response for grazing livestock is about 10 per cent.

5) *Animal housing for cattle, M\_5\_1\_1, M\_5\_1\_2, M\_5\_1\_3, M\_5\_1\_4 and M\_5\_1\_99:*

Out of 6.193 farms with cattle 590 could not answer the questions on animal housing. A donor imputation is made where the farms are divided into 3 groups:

1) Organic farms

2) Conventional farms where cows and big heifers (at least 2 years old) amount to at least half of all cattle.

3) Other farms with cattle.

For each non response farm a donor farm is selected randomly. However, what is imported to the non response farm is not the actual number of places but the relative distribution among the 5 types of animal housing. So if the donor farm has a relative distribution of:

M\_5\_1\_1=10 %

M\_5\_1\_2=20 %

M\_5\_1\_3=40 %

M\_5\_1\_4=10 %

M\_5\_1\_99=20 %

and the non response farm has 125 cattle the missing information is imputed as follows:

M\_5\_1\_1=0.10\*125=13

M\_5\_1\_2=0.20\*125=25

M\_5\_1\_3=0.40 \*125=50

M\_5\_1\_4=0.10\* 125=13

M\_5\_1\_99=0.20\*125=25

It means that for all non response farms number of places are assumed to be equal to the actual livestock, except for rounding.

- 6) *Animal housing for pigs, M\_5\_2\_1, M\_5\_2\_2, M\_5\_2\_3 and M\_5\_2\_99*: Out of 4074 farms with pigs 592 could not answer the questions on animal housing. The imputation of the missing information is the same as for cattle. The pig farms are divided into 3 groups:
- 1) Organic farms
  - 2) Conventional farms where pigs for slaughtering amount to at least 50 per cent of all pigs.
  - 3) Other farms with pigs
- 7) *Animal housing for Laying hens*: Out of 1.093 with laying hens 660 could not answer the questions on animal housing. The imputation of the missing information is the same as for cattle. The farms with hens are divided into 2 groups:
- 1) Organic farms
  - 2) Conventional farms

For animal housing the non response rate is 10 per cent for cattle, 15 per cent for pigs and 60 per cent for hens. The reason for the low response rate for hens is most likely that many farmers have just a few hens and merely as a hobby activity and thereby they have found the questions less meaningful. Maybe a category like “traditional hen house” is missing?

The partial non response animal housing hens is big. But as the non response mostly concerns small farms no more actions than the donor imputation were taken.

More pig farmers than cattle had troubles answering the question. The reason could be that the questions on places by animal housing is seen as difficult for farmers with small piglets and a fluctuating stock of animals.

- The principle is that each questionnaire has to be completed and that all questions must be answered. As described above, however, we chose to observe a certain tolerance when it came to SAPM characteristics. The questionnaires are registered in an Oracle based and interactive validation system. In this programme each survey characteristic has a maximum and sometimes also a minimum value serving as warning signals to the colleague treating the questionnaire.
- Now there are of course many questionnaires which strictly speaking are not completed in all details. Most often this is rather harmless:
- - A farmer does not answer the section on irrigation but he lives in a region where almost no farmer irrigates so obviously the answer is simply “no irrigation”.
- - A farmer does not answer the section on greenhouses. But since he does not use to have greenhouse crops and since most farmers do not have greenhouse crops the answer is obviously no.

- - Also incomplete labour force information is often rather easy to correct by means of this manual imputation. For instance it is quite obvious that the holder of a big farm works full time and cannot have a work outside the farm. Likewise a young holder of a small farm most likely has the lowest work time and a work outside the farm.
- However, some cases are more serious:
  - - A farmer known to have pigs does not indicate number of pigs.
  - - A farmer known to have poultries forgets to answer the section on poultries.
  - - A farmer known to have greenhouses forgets to indicate his greenhouse crops.
- When it comes to pigs we can often take the figures from the closest pig survey. But otherwise it is necessary to call the farmer.
- We have no exact figures for the above mentioned procedures but approximately 10 per cent of all questionnaires are subject to manual imputation and 5 per cent of the farmers are contacted on the phone.
- Some farmers – less than 0,5 per cent – may return their questionnaires with remarks as “Do not want to take part”, “I have no time”, “See my questionnaire from last year” etc. Evidently such answers are not accepted and the questionnaires are simply ignored meaning that the farmers will be contacted in the reminding process.

### **3.1.3 Methods for handling missing or incorrect data items**

- Completion/correction methods applied:  
follow up interviews - as described above about 5 per cent of the farms are contacted one time by phone if something important is missing on the questionnaire.
- Tools used and people/organisations authorised to make corrections. Analysis of processing errors affecting individual observations or qualitative assessment. All colleagues who work on FSS and SAPM have has an authority to correct survey information, for instance after having been in telephone contact with a farmer - all in all 12 colleagues. The imputation has been done by the survey leader – Karsten Larsen – by means of SAS and SQL programming.

### **3.1.4 Control of the data**

Description of controls used for checking the questionnaires and entering the data:

- edit rules/checks:  
The questionnaires are registered and also edited in an Oracle database there are about 150 validation rules where some are meant as warning rules and some are meant as “serious” mistakes meaning the concerned problems has to be solved before the questionnaire can be accepted. In addition to these rules some adhoc controls might be carried trough.
- tools used: The tool used are Oracle, SAS and excel.

All the validation work is made at Statistics Denmark. The final survey register is stored at the

PC network of Statistics Denmark. It is also the case for the special version of the survey register which Eurostat receives.

### 3.2 Evaluation of results

Have comparisons been made (micro/macro level) with other data sources (for example administrative data, crop production surveys, animal surveys, labour force surveys)?

- If not, why not?
- If yes, please give a brief description of the results of this comparison.

It is not possible to conduct a check with other sources. A real check requires that one or more independent sources exist which are highly comparable with FSS. This would be the case if we had had crops and cattle on the questionnaire in the traditional way. If so we could compare FSS with IACS and the livestock register. But as already described we have long time ago removed crops and cattle questions from the questionnaire and implemented IACS and the livestock register as sources for collecting figures for crops and cattle. It means that when comparing FSS with these two administrative registers it merely serves as a check to secure that categories are not confused – wheat has become barley and vice versa. We do in fact make such a check but evidently it says nothing about data reliability.

The closest we come at a check is when comparing FSS with a recent pig survey:

	FSS 2010, May 14	Pig survey, July 2010	Difference, per cent
Pigs, total	13.173.000	12.528.000	4,9
Piglets (C_4_1)	2.506.000	2.514.000	0,3
Sows for breeding (C_4_2)	1.297.000	1.286.000	0,8
Other pigs (C_4_3)	9.370.000	8.728.000	6,9

The category “other pigs” consists mainly of pigs for slaughtering, which can fluctuate to a wide extent during the season. So it is not surprising that the biggest difference between the two surveys is observed for “other pigs”. It should also be noticed that the pig survey is a sample of about 3.000 farms where the majority of big pig farms are selected.

	Survey		
	FSS (excl. OGA in case of sample survey)	OGA (if sample survey)	SAPM (if sample survey)
Initial list of units	52.206		42.099
Initial sample	NA		15.005
Number of holdings with completed questionnaires (incl. Eventual imputed questionnaires):	52.206		14.931
Number of units under the threshold applied *	2809		89



Holdings with ceased activities:	7.298		541
- (If information is available) of which definitely ceased, i.e. the land is abandoned	-		-
- (If information is available) of which holdings with change of the manager	-		-
Unit Non-response:	10		75
- Refusals – not corrected	0		3
- Refusals – corrected (imputed)	10		7.552 **
Number of records transferred to Eurostat	42.099		14.362
Common land units (A_2_1)	0	NA	NA

\* Units that do not meet the national threshold criteria (in some countries there could be completed questionnaires for them, in others – not). In case it's impossible to provide this information, a short explanation about the reasons to be provided.

\*\* Number of farms where at least one SAPM characteristic is imputed

Explanation: It is true that for some farms imputation has been used to make up for partial non response as has been explained earlier. One example is use of water for irrigation. But in our understanding nobody has “refused” to tell us about the farm’s use of water but some have simply found the question too difficult.

#### Comments on major trends from FSS 2007 to FSS 2010.

Comments must be given in case there is a change of more than 10% at national level between FSS 2007 and FSS 2010 for any of the groups below:

	From FSS 2007	From FSS 2010	Difference in %	Comments
Number of holdings;	44.618	42.099	-5,6	
UAA (A_3_1), ha;	2.662.590	2.646.864	-0,6	
Arable land, ha;	2.454.707	2.419.285	-1,4	
Permanent grassland (B_3), ha;	201.045	199.859	-0,6	
Permanent crops (B_4), ha;	6.837	27.721	305,5	Christmas trees were not included in 2007.
Wooded area (B_5_2), ha;	208.851	212.117	1,6	
Unutilised Agricultural area (B_5_1), ha;	47.411	53.647	13,2	
Fallow land (B_1_12_1 + B_1_12_2), ha;	202.645	34.740	-82,9	Set aside is no longer compulsory
LSU in LSU;	4.582.157	4.805.746	4,9	
Cattle (C_2), head;	1.566.218	1.571.050	0,3	
Family Labour force - in persons;	19.927	17.416	-12,6	As long as farms become bigger a falling number of family workers is to be expected

Family Labour force - in AWU;	8.338	7.332	-12,1	See below that the number of non family workers has decreased.
Non family labour force - in persons;	21.499	23.244	8,1	
Non family labour force - in AWU	19.488	20.814	6,8	

### 3.3 Data Revision Policy

- Short description of the revision policy
- Data revision practice - Average number of revisions (planned and unplanned) for key items.
- The main reasons for revisions, and the extent to which the revisions improved accuracy.

Nothing to remark.

## 4. ACCESSIBILITY AND PUNCTUALITY

### 4.1 Publications

How and when the results have been/will be published?

- Reports: preliminary results, final results, technical report, quality documentation, other (please specify)
- Date of issuing (actual or planned)
- Do the publications contain meta-data (methodological information etc.)?
- On-line database - Information about on-line databases in which the disseminated data can be accessed and, if possible, the number of consultations of data tables within a statistical domain for a given time period displayed in a graph.

Our homepage <http://www.statistikbanken.dk> is the most important channel of publication. It is available free of charge for everybody having access to the Internet, and the user can choose between Danish and English text.

The principle is that as soon as a survey is ready for publication Statistics Denmark will publish a small newsletter of two pages with a few main results, and with focus on a particularly interesting development. The Danish FSS 2010 was published May 14 2011. At the same day detailed figures were also published on the Internet with for instance regional figures. The newsletter focused on farms with pigs: One out of eight farms has pigs in 2010. They have become much bigger over the years. But twenty years ago relatively more farms had pigs, namely one out of three.

June 22 Statistics Denmark published a more detailed publication. It contains for instance regional tables. The development is described in more details than in the newsletter. It also has a basic methodological passage of about one page with mention of the survey unit, most important data sources and survey thresholds.

Figures from FSS 2010 were also published in Statistical Yearbook 2012 (published April 2012) and Statistical Ten years Review 2011 (published August 2011). Finally we also brought figures from FSS 2010 in our Agricultural Statistical Yearbook 2010 (published November 2011). This book contains figures also from other surveys than FSS as well as figures for agricultural accounts and FADN statistics.

Regarding the SAPM survey we published some figures on irrigation in our newsletter issued June 6 2012. Later in 2012, probably in November, more detailed SAPM figures will be published in our Agricultural Statistical Yearbook. The figures from SAPM are not yet published on the Internet.

## **4.2 Timeliness and Punctuality**

Time lag first results - The number of months from the last day of the reference period to the day of publication of first results

Time lag final results - The number of months from the last day of the reference period to the day of publication of complete and final results

Punctuality for delivery and publication - The number of days between the delivery/ release date of data and the target date on which they were scheduled for delivery/ release

As described above the Danish FSS 2010 was published May 14 2011 exactly one year after the survey date. A small part of the SAPM survey 2011 was published June 6 2012 almost one year after the survey data 2011.

## **5. CONFIDENTIALITY AND SECURITY**

The confidentiality is required by law. The NMR should confirm these arrangements.

Please give information about the following, taking into consideration that this report is a non-confidential document:

- The procedures for ensuring confidentiality during dissemination (incl. general description of the rules for defining confidential cells in output tables and procedures for detecting and preventing residual disclosure.).
- Whether external users may access micro-data for research purposes, and, if so, the confidentiality provisions that are applied.

All data sets regarding FSS are stored at a special library on Statistics Denmark's computer network as SAS data sets going back to 1982. Only authorised colleagues can access the individual holding information. The surveys are delivered to the Danish National Archive, which keeps the information as strictly confidential for 80 years. Researchers can obtain access to the surveys but only as anonymous information. If a researcher publishes statistical tables based on the individual information it must take place in agreement with Statistics Denmark. It is an extremely rare case that a researcher requests information from FSS.

## **REFERENCES**

- Methodological notes available
- Main scientific references

## **ANNEXES**

- Questionnaire(s)
- Formulas applied for estimation methods and calculating sampling errors
- Other

## ENDNOTES

---

<sup>(i)</sup> *Non-sampling error* is the error attributable to all sources other than sampling error. Non-sampling errors arise during the planning, conducting, data processing and final estimation stages of all types of survey.