



**FARM STRUCTURE SURVEY 1999/2000**

**NATIONAL METHODOLOGICAL REPORT**

**Member State: DENMARK**

# FARM STRUCTURE SURVEY 1999/2000

## NATIONAL METHODOLOGICAL REPORT – DENMARK

### TABLE OF CONTENTS

SUMMARY.....	3
1. INTRODUCTION .....	4
1.1. History, scope.....	4
1.2. Legislation .....	4
1.3. Main changes in the 1990's.....	4
2. CONTENT.....	7
2.1. Characteristics.....	7
2.2. Questionnaires .....	7
3. SURVEY METHODOLOGY .....	8
3.1. Survey organisation.....	8
3.2. Work process .....	8
3.3. Preparing the survey operations.....	9
3.3.1. Population and frame.....	9
3.3.2. Survey design .....	11
3.3.3. Pilot Survey.....	13
3.3.4. Informing and training the staff and respondents.....	13
3.4. Sampling, data collection and data entry.....	13
3.4.1. Drawing the sample .....	13
3.4.2. Data collection .....	13
3.4.3. Control of the data .....	13
3.4.4. Non-response .....	15
3.5. Data processing, estimation and analysis .....	15
3.5.1. Methods for handling missing or incorrect data items.....	15
3.5.2. Estimation and sampling errors .....	16
3.5.3. Non sampling errors.....	16
3.5.4. Evaluation of estimates.....	16
4. PUBLICATION AND DISSEMINATION .....	16
5. SUGGESTIONS FOR FURTHER TASKS .....	17
6. REFERENCES .....	17

## SUMMARY

The Farm Structure Survey 1999 was a total census including all agricultural and horticultural holdings in Denmark. The Survey describes the structure of agricultural and horticultural farms as well as land use, livestock and certain other aspects of Danish agriculture. The agricultural division of Statistics Denmark conducted the survey.

Since 1976 the farm structure surveys have been conducted as a mailed questionnaire-based survey. Until 1983 all surveys were conducted as total censuses. From 1984-1989 total censuses were conducted in even-numbered years and sample surveys in odd-numbered years. From 1990-98 only sample surveys were conducted. The most important change in 1990's in the Danish farm structure statistics took place in 1996 where we decided to delete most of the questions on crops from the statistical questionnaire, and instead collect the same information from the so-called IACS register.

Statistics Denmark has for many years had a special register for agriculture. In the register farms are classified to owner farms, tenancy farms, non-active farms and other farms. The farm register has been used as a base for the Farm Structure Survey.

The farmers received the questionnaire one week before the survey date, which was first Friday of May 1999. They had to return the questionnaire no later than one week after the survey date. When the questionnaires were returned to Statistics Denmark they were registered in a so-called Blaise program.

Lot of efforts was put on sending reminders to the farmers. In a few cases it was necessary to contact the police when some farmers even ignored the last reminder. This tough procedure has led to that non-response is a very small problem in the Danish farm structure statistics. Non-response occurs to about ½ percent only.

Even more resources were spent on the control of data. The first step of controlling the data was to control every questionnaire manually. The second step was computer control where every farm was controlled. The third step was a control of the aggregated results.

No sophisticated methods of imputation were used to calculate missing information. Farmers were in almost all cases contacted telephonically if the questionnaires were filled in incompletely.

The first publication of the farm structure results takes generally place in March in the year after survey, somewhat later in years of a full census. This first publication is a small newsletter. The next publication is a more comprehensive statistical report with detailed tables on farm structure, livestock and land use. Tables on agricultural statistics are also included in several general statistical publications issued by Statistics Denmark. One example is Statistical Yearbook, which covers all aspects of the Danish society, and accordingly also agriculture.

## **1. INTRODUCTION**

### **1.1. History, scope**

Since 1976 the farm structure survey on agriculture and horticulture has been conducted as a mailed questionnaire-based survey, which describes the structure of agricultural and horticultural farms as well as land use, livestock and certain other aspects of Danish agriculture.

Before 1976 the surveys were conducted by the municipalities by means of personal interviews. The results were reported to the central statistical office as aggregated results.

Until 1983 all surveys were conducted as total censuses. From 1984-1989 total censuses were conducted in even-numbered years and sample surveys in odd-numbered years. From 1990-98 only sample surveys were conducted. The survey conducted in 1999 was a total census including all agricultural and horticultural holdings in Denmark. Only sample surveys will be conducted in the years to come. Then next total census will presumably be in 2009.

Questions on crops, livestock, machinery and labour force are included in the surveys. However, questions on labour force were excluded from the surveys in 1995, 1997, 1998, 2000 and 2001.

### **1.2. Legislation**

Act on Statistics Denmark, which states that all firms are obliged to answer questionnaires from the statistical office.

There is thus no special Danish legislation on the farm structure survey.

### **1.3. Main changes in the 1990's**

The most important change in the Danish farm structure statistics took place in 1996 where we decided to delete most of the questions on crops from the statistical questionnaire, and instead collect the same information from the so-called IACS register. The IACS register contains information on area with different crops for all farms having applied for crop subsidies. In this way the IACS register *is* a statistical source; it is created to administrate the crop subsidy system but also to serve statistical purposes. Therefore the borderline between "pure statistical data" and "administrative data" represents a false idea.

If we still would include all the crops as questions on the statistical questionnaire from Statistics Denmark we would have a situation where more or the less the same statistical survey/census were conducted twice and unnecessary burdens were put on the farmers. Though the extra work for the single farm might be a few minutes only one should not ignore the fact that the negative psychological effect can be very harmful for the goodwill of the statistical office.

What we do now is to share the practical work between two government institutions thereby creating one statistical register as the final output.

The new crop subsidies granted as a premium per hectare of specific crops were introduced in 1993 and replaced thus the old price subsidies. In Denmark a farmer receives about 2.000 Danish kroner for one hectare with cereals. The farmers apply for subsidies in the early spring, and have to report their land use for the whole agricultural area of the farm to the Ministry of Agriculture, also those crops for which no subsidies can be paid. Subsidies are paid for areas with cereals, oil seeds, pulses, flax and set aside.

A farmer applies for subsidies which he grows whether the area is owned or tenanted from other farms. Areas which the farmer has leased out to other farmers are not included in the subsidy application. So the application corresponds fortunately to the statistical concept of an agricultural farm.

In Denmark almost all agricultural farms apply for subsidies. Cattle farms with no other crops than grassing areas cannot apply for subsidies, but even these farms are included in the system since they apply for livestock subsidies and therefore have to report their fodder areas to the ministry. But most Danish cattle farms grow in fact cereals.

Only horticultural farms without agricultural crops and other livestock farms than cattle farms without agricultural crops do not apply for subsidies.

In principle there also could be farms with potatoes, sugar beets and seeds for sowing but without reform crops, and thus no areas for which subsidies can be paid. Such farms are, however, very rare in Denmark.

The easiest way to use a statistical register created by another institution is simply to make a direct tabulation from these data. In Denmark we have done that currently since 1996 and that has been very useful since we in this way can produce results for the municipalities. This has not been possible for the farm structure surveys as they have all been sample surveys since 1990, and the sample has not been representative for every single municipality. But the IACS system can be seen as a total statistical census since most Danish farms apply for subsidies.

The difficult task, however, is to integrate the data collected by Statistics Denmark with the IACS register. This is necessary, at least in Denmark, since not all the needed survey characteristics in the farm structure statistics are available in IACS. In Denmark reliable and complete information on crops only can until now be collected from IACS, and not even all crops necessary for the statistics. Accordingly the whole survey must be carried through as a combination of data collected in the field in the traditional way and data collected by the Ministry of Agriculture.

In Denmark we decided to use the IACS system in the farm structure statistics for the first time in 1996. An analysis of the standard of crops in this system showed a perfect match with the statistical requirements for most of the crops. A limited list of crops, however, had to be put on the statistical questionnaire and, these crops were horticultural crops, potatoes, seeds for sowing, permanent grassland and grass in rotation. These crops did not appear in the IACS system but were included under "other crops" or aggregated in other ways which made it impossible to obtain the necessary statistical information. All the other crops were removed from the statistical questionnaire, but it was written on the questionnaire that if the farmer had not applied for subsidies in

1996 he would have to specify all crops, and not just the limited set of crops. From 1997 onwards also potatoes, seeds for sowing, permanent grassland and grass in rotation are included in the IACS system.

This was the first step which we could call the preparatory step. Here it is necessary to make very careful analyses of the subsidy system, and it is also very important to get precise agreements with the ministry about the deliverance of the data to the statistical office.

After this step the practical work could begin. We established a system at the statistical office where the answers from the farmers were divided into two groups: "Non Subsidy farms" and "Subsidy farms", which had to be treated differently. The Non subsidy farms should give a full specification of all crops whereas the subsidy farms should give information on the limited set of crops only.

In November or December every year we receive the information from the ministry. The first task hereafter is to create a key between the crops from the IACS system and the crops in the statistical system. In a lot of cases the crops in the IACS system are at a much more detailed level than necessary for the statistics so that implies a work of aggregating crops.

The next task is to create the connection between the IACS register and the statistical register. All non-subsidy farms are of course excluded from this exercise. So the connection should be created for about 15.000-20.000 farmers in the statistical sample who have applied for subsidies. This is not so easy, but on the other hand far from impossible.

We ask the farmer to indicate his special code in the ministry on the questionnaire. This is not strictly necessary but it will make the work of matching the two registers much easier. Every farmer has one code in the ministry, and no other farmer has this code. The code is a special application number used by the ministry to identify every single application.

For farmers who forget to indicate the application number a match can be created in other ways, for example by using the civil registration codes or the phone numbers as match criterions. If everything else fails to create a match it is generally possible to find a farm in the IACS register by a manual search but evidently this method should be used only for a very limited number of farms since it takes quite a lot of time.

For some farms the results from the IACS register are corrected before entering into the statistical register. One example of a correction could be when sugar beets are changed to fodder beets. The distinction between these two kinds of beets was a bit uncertain in the IACS register the first years.

This procedure was of course most difficult the first year. Though we in the end, and within the timetable, found all farms in the IACS system for which data were needed in the statistical sample, we could not say for certain that no mistakes were made. But the aggregated results were of course analysed and controlled extremely carefully and no strange or absurd structures in the figures were detected. This must be the crucial criterion for success. After all statistics are not book keeping. No doubt there have also been made mistakes in the traditional surveys until 1995 where no "administrative" data were used.

The survey is still a sample survey so the results are thus subject to the same statistical sample errors as the time before the IACS system was established.

The use of crop data from the IACS system has made the Danish Statistical office more popular among the farmers or at least less unpopular. Very few farmers call to complain about that they have to fill in the questionnaire as the number of questions has now been reduced.

The farm structure survey has kept at least the same level of statistical reliability as previously.

It is not a problem whether the IACS register is complete or not. It is not totally complete since there are some farmers who do not apply for subsidies, mainly horticultural farms. But these farmers are obliged to give a full specification of all crops to the statistical office.

The total workload for the statistical office has become smaller. The farm structure survey in 1996 was reduced by one man-year compared to 1995.

The statistical office still keeps an agricultural register with the same information. If the system of crop subsidies will be changed in the future we can go back to the old questionnaire. This will of course require more resources but will not involve any problems.

## **2. CONTENT**

### **2.1. Characteristics**

The questionnaire is not exactly the same year after year but consists generally of these sections:

- 1) Crops
- 2) Livestock
- 3) Machinery
- 4) Storage facilities for manure
- 5) Labour (only for years with Eurofarm requirements)
- 6) Questions on non-agricultural activities, "rural development" (only for years with Eurofarm requirements)

### **2.2. Questionnaires**

A copy of the 1999 questionnaire is available in English and is annexed to this report.

### **3. SURVEY METHODOLOGY**

#### **3.1. Survey organisation**

The agricultural division of Statistics Denmark conducts the survey. There is only one central statistical office in Denmark, and no regional offices. The agricultural division is divided into several smaller sections where one of these sections is the section of farm structure statistics. This section consists of one academic, who is the head of the section, and generally 3-5 clerks.

The head of section is responsible for the overall planning of the survey as well as much of the computer programming and publication of results. Also the deliverance of Eurofarm data to Eurostat is a job of the head of section.

The clerks take care of most of the practical tasks, for instance registration and control of questionnaires and telephonic contact with the farmers.

Staff outside the section naturally assists the farm structure survey when it comes to many practical tasks, for instance printing of questionnaires, which is a task of Central IT division. Such assistance could also be of an ad hoc nature, and like wise the farm structure section also sometimes assists other sections of Statistics Denmark. The computer section of the agricultural division consists of two programmers, but this section also assists other sections in the division.

#### **3.2. Work process**

A typical farm structure survey in Denmark takes place as follows:

- Last week of April: Questionnaires are sent to the farmers by post, for sample surveys 25-35.000 farms
- First Friday of May: Survey date: all reported information must have reference to this date.
- June-September: Reminders are sent to the farmers who haven't returned their questionnaires.
- May-December: Registration and control of results. Different types of register updating.
- January-February: Validation and correction of results by means of different kinds of checks, both micro and macro check procedures are used.
- March: First publication of results. During the year more detailed results are published to different publications.

### 3.3. Preparing the survey operations

#### 3.3.1. Population and frame

- **Population**

The Danish farm structure statistics 1999 include all farms which have at least 5,0 hectares of agricultural area or at least a standard gross margin at 4.000 euro at 1990 prices

- **Frame**

The base for an agricultural survey or census should be a complete register, which means a register containing all farms in the country. At least should the number of missing farms be negligible from a statistical point of view.

The unit in the register should be the farm in the sense of an economic and technical unit which produces agricultural products, where these products could be both crop products and livestock products. The farm could be run both by one person, by group of persons or by a company. Firms which are engaged in other economic activities should still be included even if agriculture plays a small part of firm's economy.

Statistics Denmark has for many years had a special register for agriculture, and this register is not directly linked to any other kind of business register. The main source of the register is a special Danish administrative register used for collecting of land value taxes from all properties. The land tax system distinguishes between agricultural properties and other properties.

A property is a land tax unit which has been subject to an independent land value assessment. The owner of a property has to pay local land taxes based on this assessment.

If all farms were run by one person, group of persons or company who owned one property the property register and the farm register would be identical, but in the real world things are not so uncomplicated. Therefore Statistics Denmark has defined different kind of farms:

- 1) **Owner farms.** This is far the most frequent case in Denmark. An owner farm is a farm where the farmer owns at least one property. If more than one property is owned one property is classified as the **main property** of the farm and other properties as **secondary properties**. An owner farm could, and this is very often the case, have tenanted area in addition to the owned area, and it could also lease some land out to other farms.
- 2) **Tenancy farms.** Such farms own no land but lease all the land from another farm or from several other farms.
- 3) **Non active farms.** These farms are not farms in the sense of an economic unit which produces agricultural products. A **Non active** farm has leased all the land out to another farm and is not itself engaged in agriculture, but is still owner of a property. These farms are not included in the statistical tables but are included in the farm register.

- 4) **Other farms.** This is a very rare case. The concerned farms are not owners or tenants of an agricultural property in the normal way but they are engaged in agriculture in other ways, for example by having leased a stable with pigs or cattle from another farmer. Under these circumstances what seems to be one farm unit by the first glance is in fact two farm units: one unit with crop production and the other unit with livestock. One could imagine that such "other farms" will become more frequent in the future. This is rather unfortunate from a register point of view since these farms are so difficult to "catch". In the survey the owner of the property might tell the statistical office that he has no livestock telling nothing about the stable he has leased out to another farmer.

The Danish farm register has in principle been created and updated year after year in the following way:

A questionnaire with questions on crops, livestock, labour force etc. is sent to every owner of an agricultural property. In cases where one owner has more than one property he will be instructed to give all the information on one questionnaire if the properties are run together as one farm unit. Owners who are not engaged in agriculture because they have leased out the land to other farmers should return the questionnaire with a mention of the name and address of the tenant. The questionnaire should then be sent to the tenant unless he can be identified as the owner of another property, in which case he will include the tenanted area in his total area.

The final result of this procedure will be a new *farm* register with:

- 1) **Owner farms** in all cases where the owner is an active farmer. In some cases two or more properties have been merged into farm units.
- 2) **Tenancy farms** in all cases where a property is tenanted by a farmer who does not own any land himself.
- 3) **Non active farms** in all cases where an owner of a property is not an active farmer himself but has leased his land out to another farmer, who can be either an owner or a tenant.
- 4) **Other farmers** in such cases where it has been possible to identify a farmer who is neither an owner nor a tenant in the traditional way.

This procedure shows that a structure census is a double exercise. The primary aim is of course to produce some statistical results on number of farms, crops and livestock, but fulfilling this purpose requires the creation or updating of the register.

Next year the newly created farm register of year T should be updated by an up to date version of the administrative property register. The output register will be a farm register which should be used as a base for the census or survey in year T+1. The following changes in the farm register should be made:

For all owner farms is the new owner of the main property transferred from the property register to the farm register if the main property has changed owner since last year. It should be noticed that no new farm in the register is created in this way, but an already existing farm has got a new owner. Tenant farms should of course be excluded from this exercise since in these cases the farmer is not the owner of the property.

All new properties, which means properties contained in the property register but not in the farm register, are added to the farm register as new owner farms.

In all cases where a secondary property of a farm has been sold but the main property still has the same owner a new owner farm is created in the farm register. The reason for this is that what was last year one farm unit now seems to be two farm units.

In all cases where a non active farm has changed owner since last year the farm should have changed it's status from non active to the status a an owner farm. In these cases it is assumed that the new owner of the property is an active farmer unlike the former owner.

In a Danish sample survey a special stratum is constructed where all "new farms" are placed. All farms in this stratum are selected.

During the census or survey of year T+1 the farm register should be modified as already described. In this way the farm register will be modified year after year, partly with information from the administrative property register and partly with information from the census or sample survey.

The farm register should of course be open for updating from other sources which may be available. These sources could be:

A general business register where it is investigated if all agricultural business units in the business register are contained in farm register as active farms.

In countries like Denmark with a crop subsidy system or other kind of agricultural subsidies it could be investigated if all applicants of subsidies are contained in farm register as active farms.

Any other sources could be included in such exercises as well.

Using such other sources could be useful to identify cases where a non-active farm in the farm register in fact has become active again. It could also be possible to identify the already described "other farms", the farms which are neither owners nor tenants in the traditional way.

### **3.3.2. Survey design**

The Danish farm structure survey is generally conducted as a sample survey, and more rarely as total censuses. This implies that "the best" sample should be selected, evidently the sample which is expected to generate the smallest sample error.

We have chosen stratification with 3 dimensions.

The first dimension is the *economic size of farm* by standard gross margin at 1995-prices. There are 8 different groups:

- 1) < 9.000 ecu
- 2) 9.000- < 18.000 ecu
- 3) 18.000- < 30.000 ecu
- 4) 30.000- < 45.000 ecu
- 5) 45.000- < 60.000 ecu
- 6) 60.000- < 80.000 ecu
- 7) 80.000- < 120.000 ecu
- 8)  $\geq$  120.000 ecu

The second dimension is the *region* where the farm is located. There are 12 different regions.

The third dimension is the *type of farming*. There are 11 different types according to the common European system of typology at the one or two digit level. If we include all subdivisions there are much more than 11 groups but only these 11 groups are felt as necessary in the stratification. The following groups are used: 1.1, 1.2, 2.1, 3.2, 4, 5.1, 5.2, 6.1, 6.2, 7 and 8. Group 6.1 is calculated differently from the common European standard, which states that 6.1 includes all farm where more than 1/3 of the standard gross margin comes from horticulture *and* more than 1/3 from permanent crops. The Danish standard has been changed so that 6.1 includes all farms where more than 1/2 of the standard gross margin comes from the *sum* of horticulture and permanent crops except those farms which are included under 2.1 and 3.2.

This gives  $8 \cdot 12 \cdot 11 = 1056$  different strata, where some, however, are vacant. There are in practice about 900 different strata. The stratification tries to avoid small strata with very few units.

When calculating the sample frame the method of optimal allocation is used. This implies that the higher the standard deviation of standard gross margin is in a given stratum the higher is the share of selected farms. This leads in practice to that large farms are “over-represented” in the sample and small farms “under-represented”. An exception from this general rule is the farms with the typology codes 2.1, 3.2 and 6.1; all farms in these groups are selected. The reason is that these farms constitute a special small group of horticultural farms. It has been difficult to produce reliable results for this group and particularly subdivisions of the group in a sample so that is why all of these farms are selected, and this has been done since 1996.

When stratifying the whole population of the farms the latest information is used for each farm. But some farms have not been surveyed after the latest total census in 1999. This implies that when stratifying the sample for, for example, the 2002 survey the full census 1999 is updated by the subsequent sample surveys 2001-02.

For each stratum is calculated an extrapolation factor to convert the sample results into total results. This conversion factor is calculated simply as the number of farms in the population divided by the number of farms in the sample within each stratum.

### **3.3.3. Pilot Survey**

A pilot survey is generally defined as a survey where the questionnaire is sent to a small number of respondents to test the questionnaire and correct it if necessary. No such pilot surveys are made for the farm structure statistics. However, in the 1998 we included the new rural development questions in the sample survey to test the wording. This was felt as a desirable measure since the questions were totally new and would become obligatory in the 1999/2000 community census.

### **3.3.4. Informing and training the staff and respondents**

To be a colleague of the farm structure team generally requires a practical education in Statistics Denmark as a trainee. (Except for the academic). This education gives a broad knowledge of how statistics are produced, and makes the trainee familiar with the computer environment, control of data, telephone contact with users and respondents etc.

New colleagues in the section of farm structure statistics will be guided by experienced colleagues until they are familiar with all steps in survey.

The farmers are not informed in the press or in other ways prior to the survey. They receive the questionnaire one week before the survey date. They also receive instructions on how to complete the questionnaire, and they are furthermore invited to call Statistics Denmark in case of problems. They have to return the questionnaire no later than one week after the survey date.

## **3.4. Sampling, data collection and data entry**

### **3.4.1. Drawing the sample**

A new sample is selected every year. In each stratum the farms are selected randomly by means of a computer program. So this means that a farm very well can be selected in year T even if it was also selected in year T-1. Due to the sample method mentioned above big farms, for instance farms with more than 100 hectare of agricultural area, are selected every year.

### **3.4.2. Data collection**

When the questionnaires are returned to Statistics Denmark they are registered in a so-called Blaise program. Blaise is a system specially designed to register questionnaires of different kinds. The paper questionnaires are stored until the survey is completed.

### **3.4.3. Control of the data**

If all farmers would send in the questionnaires before the dead line and if they furthermore would fill in these questionnaires absolutely correctly it would be a rather easy task to produce agricultural statistics very rapidly and with few resources.

But in the real world it is necessary to spend a lot of efforts on sending reminders to the farmers. In a few cases it is unfortunately necessary to contact the police when some farmers even ignore the last reminder, which is

a recommended letter with a new copy of the questionnaire. This tough procedure is felt as necessary since no farmer should be allowed to tell his colleagues that questionnaires from the statistical office can be ignored. This leads to that non-response is a very small problem in the Danish farm structure statistics.

Even more resources are spent on the control of data. The control falls into three steps:

1) Every questionnaire is controlled manually and compared with the questionnaire from previous surveys where the farm has taken part. If for example a farmer had pigs last year but not now the farmer will be contacted on the phone to make sure whether there really are no pigs on the farm or the farmer has forgotten to indicate his pigs. About 15-20 pct. of the farmers are contacted on the phone to clarify questionable cases. The figures are at the same time registered on the computer in a Blaise program. This program makes a simultaneous error detection. It should be emphasised that the clerical staff responsible for all this control work are not allowed to "guess" missing information based on answers from previous surveys. The phone must be used, and only in very few completely impossible cases, and after agreement with the head of section, it can be allowed to complete the questionnaire with "non authentic" information.

2) Second step is a computer control where every farm is controlled. An error detection program lists a specified set of cases which *could* be mistakes, for example:<sup>1</sup>

- A big live stock farm has no storage facilities for manure.
- A cattle farm has no fodder areas.
- A farm has sugar beets and is located in a district where sugar beets are very rare. (It should probably be fodder beets).
- A very rare characteristics is registered, for example mushrooms.
- A characteristics has an unrealistic value, for example 1.000 horses.

In addition to these probability checks there are certain logical checks:

- An invalid characteristic code is registered, for instance there is no characteristic with a code 936.
- An invalid municipality code is registered.

3) The third step is a control of the aggregated results. For each district and characteristic the aggregated (and extrapolated) result is printed together with the same value for last years survey. Here it is possible to detect strange developments. Most often mistakes are detected for characteristics which only very few farms have, for example poultry. One single mistake can in such a case be very visible. This could lead to that a new print of for example all farms with turkeys in a given district must be made and controlled for errors.

---

<sup>1</sup> This computer control takes place after the integration with administrative crop data. Otherwise the check would hardly make any sense.

However, there are no formal procedures at this level of the data control, but the check is nevertheless extremely useful.

#### **3.4.4. Non-response**

As already mentioned non-response is a very small problem in the Danish farm structure census. In addition to the few farmers who refuse to complete the questionnaire there is a small group of farms where it is impossible to collect information. One obvious example is that the farmer is dead, and no new farmer has taken over.

So non-response occurs but amounts to about ½ percent only. For stratas with non-response the extrapolation factor is increased proportionately to the non-response.

Obviously this method cannot be used in a total census. Here it is necessary to "guess" the information from previous surveys.

#### **Number of respondents in 1999 census**

The questionnaire was sent to 79.616 farms. Of these about 300 hundreds farms didn't respond. This could be due to refusal, but more often to illness, death or bankruptcy of the farmer in the period around the survey date, and where it thus was impossible to request statistical information. For these non-response farms the statistical information was registered by utilising information from previous surveys or "guessed" in other ways.

The 79.616 are distributed as follows:

57.831 active farms above the threshold; statistical tables are created for these farms only.

4.684 active farms below the threshold.

17.101 non-active farms. These are cases where the land has been sold or farmed out, or where the land isn't used any more for agricultural purposes.

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

#### **3.5.1. Methods for handling missing or incorrect data items**

No sophisticated methods of imputation are used to calculate missing information. As mentioned above farmers are in almost all cases contacted telephonically if the questionnaires are filled in incompletely.

This is a procedure which requires a lot of resources, and one could ask if it would matter so much if more automatic imputation procedures were introduced thereby saving resources for other tasks. Mostly likely aggregated results would not be influenced significantly. But this is not a sufficient argument. The farm structure survey is not just conducted to produce aggregated results. An important aim is also to create a register which can be used as a sample base for other surveys, for instance special livestock surveys and harvest surveys. Therefore it is of crucial importance that the farm register created by the farm structure surveys/censuses consists of

absolutely reliable information, not only as aggregated results, but also for individual farms.

### 3.5.2. Estimation and sampling errors

For all the statistical results at the national level standard deviations are calculated. This gives the statistical user a fair chance to assess the quality of the statistics. The table below shows the results for some selected values.

#### Statistical results and standard deviations for selected characteristics, Danmark 2000

Characteristic:	Statistical results (number or hectares)	Standard deviation
Number of farms .....	54 541	0,4
Number of pigs .....	11 921 573	0,6
Number of cattle .....	1 867 937	0,9
Number of sheep .....	145 492	11,9
Agricultural area .....	2 646 982	0,4
Area with winter wheat .....	611 183	0,8
Area with pulses .....	35 590	3,2
Area with strawberries .....	984	6,5

The table shows that for the most important crops and animals in Danish agriculture extremely reliable figures can be made, but for other categories which only few farmers have one must be satisfied with a more rough estimate.

### 3.5.3. Non sampling errors

Nothing to mention

### 3.5.4. Evaluation of estimates

Nothing to mention

## 4. PUBLICATION AND DISSEMINATION

The first publication of the farm structure results takes generally place in March in the year after survey, somewhat later in years of a full census or a big sample.

This first publication is a small newsletter with only one statistical table on number of farms distributed by size of the agricultural area. A brief comment of the development compared to last year is included.

The next publication is a more comprehensive statistical report with detailed tables on farm structure, livestock and land use. This report also includes regional results, which traditionally are felt as particularly interesting by many users.

Tables on agricultural statistics are also included in several general statistical publications issued by Statistics Denmark. One example is Statistical Yearbook, which covers all aspects of the Danish society, and accordingly also agriculture. The Statistical Yearbook is available in English translation on the homepage of Statistics Denmark [www.dst.dk](http://www.dst.dk)

On the homepage can also be found a table bank where the user can create his own statistical tables. The long-term aim of the table bank is that all detailed tables should be available here, and that tables in paper publications should be less detailed. At least any table on paper should also be available electronically. Everybody has access to the table bank free of charge.

The most detailed publication of farm structure results takes place in the yearly publication *Landbrug (Agriculture)*. It contains very detailed tables, not only on number of farms, land use and livestock, but also typology tables, machinery, labour force as well as special tables on farms by size of livestock and special crops. Also agri-environmental tables on livestock density could be mentioned. *Landbrug* has also several chapters on agriculture from other fields than farm structure statistics, for instance crops and livestock production.

## **5. SUGGESTIONS FOR FURTHER TASKS**

## **6. REFERENCES**