

**Farm Structure Survey 2007**  
**National Methodological Reports (NMR)**

Country: Croatia

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## SUMMARY

In Croatia only one independent census of agricultural holdings, or farm structure surveys, was conducted before the year 2000 and it was in 1960. In 1969 a sample census of agricultural holdings was conducted, and in 1971, 1981 and 1991 data about agriculture were collected within population censuses. However, due to a limited number of questions related to agriculture, these data do not provide complete and comparable information on the structure of agricultural holdings in Croatia. In the year 2003 first EU comparable Agricultural Census was carried out.

After the Agricultural Census 2003 we followed the EC programme of Farm Structure Surveys (FSS) regarding the list of characteristics as well as the time table. The reference date for the Farms Structure Survey 2007 for the data on land, land use and livestock was 1 June 2007; the reference period for the data on labour force was from 1 June 2006 to 31 May 2007.

The following data were collected in the FSS 2007:

- land owned and land used by agricultural holdings,
- crop areas,
- number of livestock by categories,
- labour force,
- other gainful activities on agricultural holdings,

The list of characteristics follows the EC programme of Farm Structure Surveys as well as national needs.

The observation units in the survey were agricultural holdings in the territory of the Republic of Croatia, which are divided into:

- agricultural enterprises (surveyed by post),
- family farms (surveyed by face-to-face interview)

Agricultural holdings should apply to the following threshold:

- at least one hectare of utilised agricultural area, or
- less than one hectare of utilised agricultural area, but:
  - at least 0.1 hectare of utilised agricultural area and 0.9 hectare of forest, or
  - at least 0.3 hectares of vineyards and/or orchards, or
  - two or more livestock units (LSU), or
  - 0.15 to 0.3 hectare of vineyards/orchards and 1 or 2 LSU, or
- are market producers of vegetables, herbs, strawberries, mushrooms, flowers or ornamental plants.

All agricultural enterprises were surveyed, but only those family farms that were chosen in the sample (altogether 11,000 family farms). The sampling frame was a list of all active family farms from Census of Agriculture. There were altogether 188,213 family farms included into the sampling frame.

Preparations for the FSS 2007 started in autumn 2006 and will end on May 2007. Fieldwork was carried out between 1 and 15 June 2007. Data were entered manually for agricultural enterprises while data for private family farms were entered by optical reader. For sampling, data verification, imputations and estimation of sampling errors, SAS was used.

# 1. INTRODUCTION

## 1.1 *History, scope*

In Croatia only one independent census of agricultural holdings, or farm structure surveys, was conducted before the year 2000 and it was in 1960. In 1969 a sample census of agricultural holdings was conducted, and in 1971, 1981 and 1991 data about agriculture were collected within population censuses. However, due to a limited number of questions related to agriculture, these data do not provide complete and comparable information on the structure of agricultural holdings in Croatia.

In 2003 Croatia carried out an independent Agricultural Census, which was carried out according to the:

- Commission Decision 2000/115/EC of 24 November 1999 relating to the definitions of the characteristics, the list of agricultural products, the exceptions to the definitions and the regions and districts regarding the surveys on the structure of agricultural holdings;
- Commission Decision 98/377 of 18 May 1998 adapting Annex I to the Council Regulation (EEC) No 571/88 in view of the organisation of the Community surveys on the structure of agricultural holdings.

When establishing the methods for the Agricultural Census 2003 the recommendations of the FAO regarding the world agricultural censuses were also taken into consideration.

After the Agricultural Census 2003 we followed the EC programme of Farm Structure Surveys (FSS) regarding the list of characteristics as well as the time table. In 2007, Farm Structure Survey was carried out according to the following regulations:

- Commission Regulation (EC) No 204/2006 of 6 February 2006 adapting Council Regulation (EEC) No 571/88 and amending Commission Decision 2000/115/EC with a view to the organisation of Community surveys on the structure of agricultural holdings in 2007.

The reference date for the Farms Structure Survey 2007 for the data on land, land use and livestock was 1 June 2007; the reference period for the data on labour force was from 1 June 2006 to 31 May 2007.

## 1.2 *National legislation*

The legal bases for conducting the FSS 2007 are two acts:

- National Statistics Act (OJ HR No. 103/03)
- Annual Implementation Plan of Statistical Activities (OJ HR Nos. 117/06) which deals with all statistical surveys and work to be done in 2007

The National Statistics Act defines the following fundamental principles:

- Professional and institutional independence
- Statistical confidentiality
- Availability, accessibility and clarity of information
- International comparability

- Transparency of methodology
- Rational use of resources
- Access to administrative data sources.

In the Annual Implementation Plan of Statistical Activities the following issues are dealt with:

- Responsible institution: Statistical Office of the Republic of Croatia
- Content of the survey:
  - land use
  - crops on arable land
  - permanent crops
  - number of livestock
  - other characteristics used for calculation of different indicators
- Scope of the survey:
  - collecting data the structure of agricultural holdings
  - Ensuring data on agricultural holdings comparable with other Member States of the EU.
- Frequency of the survey: every 2-3 years
- Reference date: 1 June 2007
- Who should provide the data and when:
  - all agricultural holdings performing agricultural activity;
  - Agricultural holdings should provide data from 1 June – 30 June 2007
- Deadline for publishing final results: April 2011
- Harmonisation with EU legislation (partially /fully): Fully

**Tasks in 2007** according to the Annual Implementation Plan of Statistical Activities were the following:

- preparation of the questionnaire and methodology
- survey implementation
- data processing

**Tasks in 2008** according to the Annual Implementation Plan of Statistical Activities were the following:

- data processing

**Tasks in 2010** according to the IPA 2008 Multi-Beneficiary Programme on Statistical Cooperation For Project “Data Transmission for Farm Structure Surveys”:

- preparation a report on discrepancies between FSS questionnaire and Eurofarm requirement
- preparation a transition table from national FSS Database record to Euro Farm record
- calculation of SO coefficients
- calculation of other characteristics (e.g. LSU, AWU, type of farming, socioeconomic type)

**Tasks in 2011** according to the IPA 2008 Multi-Beneficiary Programme on Statistical Cooperation for Project “Data Transmission for Farm Structure Surveys”:

- deliver SO coefficients and methodological report on its calculation
- adjust the FSS database and prepare a module to transfer data in to acceptable format for Eurofarm
- deliver data to Eurostat in Eurofarm format via eDamis.
- Corect the data until it passes Eurostat data validation control

National legislation does not deal with financial resources needed for the implementation of the Farm Structure survey.

## 2. CONTENT

### 2.1 Characteristics and reference period

The following groups of questions were included in the questionnaire for FSS 2007:

- Address of the holding
- Labour force on family farms
- Other gainful activities
- Area – total:
  - Crops on arable land, main and secondary crops
  - Permanent crops
  - Fertilization
  - Irrigation
- Number of livestock

Reference date of the FSS 2007 was 1 June 2007.

Reference period was 1 June 2006 – 31 May 2007.

Some of the characteristics from the list of characteristics were not included into the FSS 2007, because they are not existing (NE), not significant (NS) or not applicable (NA) in Croatia. The list of these characteristics is presented in Table 1.

**Table 1: List of NE and NS characteristics**

Field ID	Unit	Label		Comment
B0102	Holding type	Legal personality of the holding 5-Holding is a group holding	NE	
CC03	HA	Agricultural area used for shared farming and other modes	NE	
D02	HA	Durum wheat	NS	Very rare crop in Croatia
DO7	HA	Rice	NE	Not grown in Croatia
D09F	HA	Lentils, chick peas and vetches	NS	Very rare crop in Croatia
D09F	HS	Other protein crops harvested dry	NS	Very rare crop in Croatia
D20	HA	Other crops	NS	Very rare crop in Croatia
D24	HA	Hops	NS	Very rare crop in Croatia.

D25	HA	Cotton	NE	Not grown in Croatia
D29	HA	Linseed	NS	Very rare crop in Croatia.
D31	HA	Flax	NS	Very rare crop in Croatia
D32	HA	Hemps	NS	Very rare crop in Croatia
D33	HA	Other textile crops	NE	Not grown in Croatia
D35	HA	Industrial plants not mentioned elsewhere	NS	Very rare crop in Croatia
F03	HA	Permanent grassland, eligible for the payment of subsidies	NE	Permanent grassland, eligible for the payment of subsidies NE Estimated as not significant in 2007. In 2007 there was no special payment for permanent grassland taken out of production. Permanent grassland and meadows no longer used for production purposes and eligible for the payment of subsidies" (F03) are included in "Rough grazing" (F02)"
G01B	HA	Fruit and berry species of subtropical climate zones	NS	Exist with very small area
G03A	HA	Olive plantations- table olives	NS	Olive plantations - table olives NS Not important crop in Croatia.
GO4C	HA	Table grapes	NS	Exist with very small area
GO4D	HA	Raisins	NE	Not grown in Croatia
G07	HA	Permanent crops under glass	NE	Not grown in Croatia
I02	HA	Mushrooms	NS	Exist with very small area
I08	HA	Set-aside areas under incentive schemes-total	NE	This kind of incentive schemes were not foreseen for Croatia in 2007.
I08A	HA	Areas not used for production, subject to subsidies and set-aside incentive schemes	NE	

I08B	HA	Set-aside areas under incentive schemes-raw material for non food purposes	NE	
I08C	HA	Set aside areas under incentive schemes – converted into permanent pasture	NE	
I08D	HA	Set aside areas under incentive schemes – converted into permanent wooded areas	NE	
I08E	HA	Set aside areas under incentive schemes – others	NE	
M01E	y_n	Other gainful activity: aqua culture	NS	
M01F	y_n	Other gainful activity: renewable energy production	NS	

Deviations from the EU definitions can be found in only a few areas. Those deviations can mostly be attributed to specific national circumstances. Examples include:

- in respect to classes of AWU (99 - Worktime 75 - <100% of 1 AWU and 100-worktime 100% of 1 AWU) data for family agricultural holdings were collected in a way that the two classes merged into one, while the for agricultural enterprise data exists for all classes of AWU
- data on working hours of manager in agricultural enterprises are missing on questionnaire and these data are imputed afterwards in data processing

Some of the characteristics were added to the questionnaire for national purposes only:

- holder's name and surname
- areas under triticale
- address of the holder
- level of agricultural education for all persons in the household
- use of mineral and organic fertilizers
- number of trees in extensive orchards and olive groves and number of vines in vineyards – needed for calculation of production
- labour force on family farms: we collected data for all persons in the household not only for those working on family farms (in order to insure data comparability with previous FSS/Census)
- all spices of vegetables are added in open fields, in glasshouses and in kitchen gardens

There were no changes in the definitions compared with previous surveys.



## 2.2 Questionnaire

Two different paper versions of the questionnaire were prepared for:

- family farms;
- agricultural enterprises

On the first page of the questionnaire the address of the farm was pre-printed as well as the identification number of the farm, including the bar code of the identification number. The identification number and the bar code were an important tool in the logistic and processing of the questionnaires.

Copies of the questionnaires for FSS 2007 are attached in Annex I.

## 3. SURVEY METHODOLOGY

### 3.1 Survey organisation

CBS was the responsible body for conducting the FSS 2007. No special Census Committee was formed for the FSS 2007, but the Agricultural Statistics Committee (ASC) acts its role. It is an advisory body of the CBS in which there are represented different ministries, research institutes and other governmental and non-governmental bodies having an interest in agricultural statistics. The changes of methodology are discussed within the ASC. The ASC discussed the questionnaire, methodology and organisational aspects of the FSS. In the FSS 2007 276 interviewers were engaged. Their work was supervised by supervisors in local offices at the county level. Interviewers and supervisors were selected by CBS. In the selection procedure the priority was given to the applicants with finished agricultural education programmes and with experiences in last AC 2003.

### 3.2 Calendar (overview of work progress)

Tasks	Dates
<b>QUESTIONNAIRE AND METHODOLOGY</b>	
Preparation of questionnaire and methodology	October 2006 – May 2007
Harmonisation of list of characteristics with main users	Jan – May 2007
Questionnaires	Jan – May 2007
Methodological explanations for interviewer PRINTING s	Jan – May 2007
Other material	Jan – May 2007
Updating of list of farms	Jan – May 2007
Determination of criteria for data sampling	Jan – May 2007
<b>SAMPLE</b>	
Selecting of sample	April 2007
Distributions of ag. holdings among interviewers	May 2007

Selection of interviewers, preparation of contracts	May 2007
Preparation of material for interviewers	May2007
Preparation of payment for interviewers	May2007
Training of supervisors and interviewers; preparation and realization	May2007
Advance letter to agricultural holdings	May 2007
Field work (1 - 20 June 2007)	June 2007
Recording of incoming questionnaires and sorting	June - July 2007
Preparation of program for data entry	July - August 2007
Data entry and checking of data (optical reader, SQL)	July - August 2007
Obtaining of data	September 2007
Administrative data	June - Nov 2007
Data analysis	June - Nov 2007
Calculation of sampling weights	June - Nov 2007
Calculation of CV	June - Nov 2007
Preparation of rules for data checking and imputations	Jan – Mar 2008
Preparation a report on discrepancies between FSS questionnaire and Eurofarm requirement	Nov 2010
Preparation a transition table from national FSS Database record to Euro Farm record	Dec 2010 – Feb 2011
Calculation of SO coefficients	Dec 2010 – Feb 2011
Calculation of other characteristics (e.g. LSU, AWU, type of farming, socioeconomic type)	Dec 2010 – Feb 2011
Deliver SO coefficients and methodological report on its calculation	Feb 2011
Adjust the FSS database and prepare a module to transfer data in to acceptable format for Eurofarm	Jan – March 2011
Deliver data to Eurostat in Eurofarm format via eDamis.	April 2011
Corect the data until it passes Eurostat data validation control	
Preparation of tables - final results	April 2011
Preparation of methodological report	Jan – April 2011
DATA PUBLISHING	April 2011

### ***3.3. Preparing the survey operations ('planning the survey')***

#### ***3.3.1 Population and frame***

- **Population**

Population of the survey were agricultural holdings performing agricultural activity. The definition of agricultural holdings as well as the threshold was established at AC 2003 and has not changed since then.

**Agricultural holding** is a single unit, both organisational and operating, of agricultural area utilised, forests, buildings, equipment and labour force, which has a single management and which is engaged in agricultural production.

**Agricultural production includes:**

- crop production:
  - production of cereals, other arable crops and grassland
  - production of vegetables, ornamental plants, seeds and seedlings
  - wine and fruit growing
  - mushroom production
- livestock breeding:
  - cattle
  - pigs
  - poultry
  - sheep and goats
  - horses
  - beekeeping
  - breeding of other animals for human consumption

**Agricultural production does not include:**

- processing of agricultural products produced on agricultural holdings or agricultural products bought,
- agriculture services,
- forestry,
- fish farming and fishery,
- raising horses for recreation, if all fodder is bought.

Agricultural holding has **single management** when it is managed as a single unit in view of sharing the profit and loss, regardless of the number of persons managing it. A single agricultural holding is also a holding in which the management is divided among family members, but the profit and loss, labour force and machinery are common. Its manager can be a natural or a legal person.

**Holder** of an agricultural holding can be a natural or a legal person acting as its own account manager.

**Agricultural farms** covered in sampling frame are those having:

- at least one hectare of utilised agricultural area, or
- less than one hectare of utilised agricultural area, but:
  - at least 0.1 hectare of utilised agricultural area and 0.9 hectare of forest, or
  - at least 0.3 hectares of vineyards and/or orchards, or
  - two or more livestock units (LSU), or
  - 0.15 to 0.3 hectare of vineyards/orchards and 1 or 2 LSU, or
- are market producers of vegetables, herbs, strawberries, mushrooms, flowers or ornamental plants.

All the statistics of agriculture correspond to this threshold; there is no special national threshold.

Definition of agricultural holding has not changed thus data are fully comparable.

• **Frame<sup>1</sup>**

The list of agricultural enterprises was obtained from the Business Register which is updated with results of AC 2003 and regular surveys.

All agricultural enterprises were surveyed, but only those family farms that were chosen in the sample. Therefore, only the frame for family farms is described.

The sampling frame was a list of all active family farms from the database from Census of Agriculture 2003 at CBS. The first basic stratum comprises 188,213 households, and there are 260,319 households remaining out of the total of 448,532.

The 188,213 households are divided into 4 strata according to the following criteria: Statistical Register of Agricultural Holdings is established in 2009 in order to have a stable sampling frame for all agricultural surveys. It will be operational from 2009 and for FSS is not used. CBS put a lot of effort to use all available statistical and administrative sources for updating the sampling frame and for compare.

**3.3.2 Survey design**

The data collection method depends on legal personality of the agricultural holdings:

- Data on agricultural enterprises (i.e. legal persons from the Business Register) were collected with the questionnaire by post. The survey was exhaustive.
- The survey on family farms was a sample survey carried out by interviewers.

The sample design for family farms is stratified simple random sampling.

Family farms were stratified according to 20 criteria which are shown in Table 3 and according to the 21 county (NUTS 3)

**Table 3:** Criteria for distribution of family farms into strata

The 188,213 households are divided into 4 strata according to the following criteria:

	Stratum 1	Stratum 2	Stratum 3	Stratum 4
UAA (ar)	2000 or more	700-<2000	200-<700	<200
Arable land and gardens (ar)	=>600	150-<600	40-<150	<40
Wheat (ar)	=>250	100-<250	20 -<100	<20
Extensive orchards (number of trees)	>=150	70 -<150	20 -<70	<20
Vineyards (ar)	>=500	150 -<500	40-<150	<40
Orchard plantations (ar)	>=200	70 -<200	20 -<70	<20
Potatoes (ar)	>=100	30 -<100	10 - <30	<10
Maize (ar)	>=250	70-<250	20 -<70	<20
Meadows (ar)	>=200	70 -<200	20 -<70	<20
Pastures (ar)	>=200	70 -<200	20 -<70	<20
Bovines, total (number)	>20	7-20	3-6	1-2
Pigs, total (number)	>50	7-50	2-6	1

<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

Sheep, for breeding (number)	>50	7-50	4-6	1-3
Goats, for breeding (number)	>50	7-50	4-6	1-3
Fattening chickens (broilers)	>=1000	70-999	20-69	1-19
Laying hens and other hens	>=1000	70-999	20-69	1-19
Other poultry	>=1000	70-999	20-69	1-19
Horses	>=20	7-19	3-6	1-2
Rabbits	>=75	30-74	10-29	1-9

All the units of stratum 1 were chosen for the sample. The frequency (number of units) in the stratum 4 sample was corrected in favour of stratum 2, and due to substantial homogeneity of stratum 4, it was not necessary that the sample should have a large number of units. Another correction was made in the selection of units for the sample. Due to substantial geographical scatter of units selected for the sample, and a large number of settlements featuring only 1 unit, a new sample was selected, which met the requirement that at least three units in strata 2, 3 and 4 respectively selected for the sample must be from the same settlement (we formed clusters of 3 farms belonged to the same settlement and size-class). This requirement could not be imposed on stratum 1, as all the units were selected. The sample was selected at county level, and for all four strata within a county. In Table 4 distribution of family farms in the sampling frame and in the sample is shown.

Table 4: Number of family farms in the sampling frame and sample by strata

Stratum	Number of holdings	%	Number of holdings in sample	Corrected number in sample
1	3 953	2	3 953	3 953
2	21 107	11	846	1 842
3	75 589	40	2 889	2 889
4	87 564	47	3 312	2 307
total	188 213	100	11 000	10 991

A sample is drawn for each sample survey. However, family farms from stratum 1 are always included into the sample because they are important in the sense of agricultural production.

When deciding about the sample size, several aspects were taken into account:

- CVs that are requested in the legislation for the surveys on livestock numbers and areas sown;
- Historical experiences;
- Budget.

Within the framework of the FSS 2007, the regular annual Survey on Areas Sown was carried out. With this kind of organization we carried out only one survey and reduced the response burden on farmers. On the other hand, we have to provide results for the Survey on Areas Sown much earlier than for the FSS, which means more burdens for the CBS.

### ***3.3.3 Pilot survey***

There was no special pilot survey carried out due to several reasons. Since the list of characteristics remained mainly unchanged and due to lack of resources, we decided not to carry out the pilot survey. In the field of agriculture there are also other statistical surveys carried out by interviews.

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

#### **Informing the farmers**

The farmers were informed about the FSS 2007 by letter of notification sent to all family farms in the sample with the basic information on the FSS:

- what is the FSS and what is the purpose of the FSS,
- when the FSS will be carried out,
- who is responsible for the FSS,
- which data will be collected,
- information about the protection of collected data.

#### **Training of supervisors and interviewers**

Before the FSS, the CBS organised training for supervisors and interviewers as well. Training was carried out by the CBS. The training sessions took one day. There were altogether 21 training sessions organized in counties during May 2007.

At the training we provided all necessary documents to the interviewers:

- questionnaires with pre-printed addresses
- separate list of agricultural holdings that interviewer has to visit
- methodological explanations and definitions of characteristics surveyed
- all the necessary stationery.

At the training the interviewers and supervisors had to sign a statement that they will return all the material connected with the FSS and that they will not copy, transcribe or otherwise misuse the data from the questionnaires on family farms.

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

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

From stratum 1 (large family farms) we drew all units, while in other strata the number of selected units was proportional to the number of units in the frame per strata. We used stratified simple random sampling of clusters of three farms. For drawing the sample, SAS program, SURVEYSELECT procedure, was used.

### **3.4.2 Data collection and entry**

#### **Fieldwork organisation, data transmission to CBS**

Data on family farms were collected with the help of authorised interviewers, while the data on agricultural enterprises were collected by post.

The CBS carried out the FSS of family farms with 21 field supervisor and 220 interviewers selected by CBS. Every field supervisor co-ordinated work of about 10 interviewers and every interviewer had to cover about 50 family farms.

The CBS equipped the field supervisor and interviewers with all the necessary material (lists of farms, questionnaires, methodological guidelines, authorisation for work, office supplies). Interviewers performed fieldwork between 1 and 20 June 2007. They delivered answered questionnaires daily to their supervisor. Each interviewer had to take a FSS of all family farms on their lists. Supervisors examined the answered questionnaires, checked the sums and sent the questionnaires to the CBS. At the CBS the questionnaires were recorded with the bar code printed on each questionnaire. The record of received questionnaires served to control the work of interviewers and supervisors. Received questionnaires were put in folders by areas covered by individual interviewers.

Parallel with the recording, the CBS checked - especially in the first week of FSS implementation - a few questionnaires from each interviewer. Field supervisors were informed about all systematic errors by telephone.

At the end of the FSS, supervisors had to collect all the FSS material and return it to the CBS.

#### **Completion time per questionnaire**

Completion time is not recorded for personal interviewing at family farms.

#### **Data entry modes**

FSS data were entered manually at the CBS with optical reader.

### **3.4.4 Control of the data**

Supervisors examined the answered questionnaires, checked the sums and sent the questionnaires to CBS. CBS provided a list of data controls that should have been done.

In the first week of FSS implementation CBS screened a few questionnaires from each interviewer. Supervisors were informed about all systematic errors by telephone.

After the data entry, we also used special logic-numeric control for micro data. These controls were calculation controls and logical controls. Before corrections were accepted and entered, the field supervisors or farmers had been contacted by telephone if necessary.

The following controls were done at micro level:

- By coded answers (e.g. 1, 2) we checked if the foreseen codes were used,

- Completeness of data (e.g. if there is area irrigated, it should be less than total agricultural area)
- data on the irrigation method)
- Sums were checked,
- For every characteristic the maximum value was determined on the basis of previous surveys. If the entered value exceeded the maximum value, the controller had to check the paper questionnaire or to contact the farmer.
- Relations among certain characteristics were checked, e.g.:
  - livestock and storage facilities for natural fertilisers of animal origin
  - density of trees in orchards and vines in vineyards,
  - in the part of the questionnaire on the labour force there were several cross checking
  - etc

By SQL, errors were divided into:

- hard errors (e.g. wrong sums, wrong codes used, illogical data, etc.) – The error should be solved before the data entry continues. In most cases data with hard errors were checked by farmers by telephone. There were altogether 80 hard errors foreseen.
- active signals (e.g. maximum values of certain characteristics were exceeded) – CBS provided instructions how to proceed in this kind of errors. There were altogether 70 active signals foreseen.

After checking with SQL, we undertook analysis at macro level with SAS software:

- we checked the maximum values for each characteristic,
- we compared our data with applications for subsidies at macro level.

In this way we have tried to avoid errors at data entry.

### **3.4.5. Non-response**

The response rate is the share of response among all eligible family farms. Although we obtained the answer after the deadline for data collection (e.g. farmers refused the interviewer but they were willing to answer by telephone), we consider this as a response.

The eligibility rate is the share of eligible family farms among all family farms chosen for the sample.

The final response rate was 97.4%. However, we put a lot of effort to obtain complete response from agricultural enterprises and from large family farms. For this purpose we contacted farmers by telephone if necessary.

Beside the response rate we have also calculated so called interviewing rate.

Interviewing rate is the share of interviewed family farms among all family farms chosen for the sample. Response rates, eligibility rates and interviewing rates are shown in the table 5.



**Table 5:** Eligibility rates, response rates and interviewing rates by strata

	<b>Eligibility rate (%)</b>	<b>Response rate (%)</b>
Stratum 1	92,5	97,1
Stratum 2	97,6	97,6
Stratum 3	92,8	97,3
Stratum 4	78,6	97,7
<b>Ukupno</b>	<b>94,4</b>	<b>97,4</b>

The main reasons for non-response were refusals because of the following reasons:

- dissatisfaction with the current agricultural policy in Croatia,
- problems with unsolved ownership (official procedures regarding succession can be very long),
- general refusal because of other reasons.

### **Non response of agricultural enterprises**

Agricultural enterprises were not a part of the sample and are not included in the statistics in the table 5. Annual Implementation Plan of Statistical Activities, reporting of data is obligatory for the enterprises (and voluntary for family farms). Due to low number of agricultural enterprises, all enterprises with non-response were contacted via telephone and asked for the cooperation. Due to administrative sources available we only had to obtain data on the labour force.

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

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

In the process of data validation, we considered national rules (described in 3.4.4) as well as validation rules for EUROFARM.

All data on labour force were imputed using ad hoc imputations.

Validations and imputations were done by SAS.

### **3.5.2 Estimation and sampling errors**

The obtained data were weighted due to unequal probability of selection and non-response. The same methodology is used for all agricultural surveys.

For key variables (cattle total, dairy cows, pigs total, poultry total, horses total, sheep and goats, arable land total, cereals total, wheat, barley, potatoes, hops, vegetables, grassland, vineyards, fruit and orchard plantations) standard errors and coefficients of variance were calculated. Estimation process was done by SAS, SURVEYMEANS procedure.

The response rate is the share of response among all eligible family farms.

Ineligible family farms are those which no longer existed during interviewing. The eligibility rate is the share of eligible family farms among all family farms chosen for the sample. Response rates and eligibility rates are shown in Table 5 in the chapter 3.4.5.

### **3.5.3 Non-sampling errors<sup>2</sup>**

#### **Coverage errors**

##### **Undercoverage**

The probability of undercoverage in the FSS is very low since there are not many new agricultural holdings. We considered that the number of agricultural households decreases, and that the number of newly not in balance, i.e., that more of those who were terminate of farming. All important new farms are included in administrative registers and were consequently included into the list.

##### **Overcoverage**

Almost 6 % of family farms drawn in the sample were not eligible. With the aid of questions in the questionnaire we also record the reasons for the non-eligibility. This helps us by updating the future Statistical Register of Agricultural Holdings (exclusion of ineligible family farms from the frame). We assume that the next Agricultural Census will give us the real degree of overcoverage when the entire frame will be updated again.

##### **Misclassification**

Since post-stratification is not done in Croatia, misclassification was not assessed. However, results of the FSS prove that there were no problems with misclassification.

##### **Contact errors**

All the family farms that were not contacted during the fieldwork were later called by phone from the CBS. We were not able to contact some of the family farms by phone either.

There were altogether 527 (3% of the total sample) family farms that were not contacted due to the following reasons:

- In 412 cases there was nobody at the address given. Each interviewer had to visit a family farm from the list at least 5 times and leave the leaflet about the visit. These family farms were treated as “they would not respond”.
- In 72 cases the interviewer was able to find the address, but the person (holder of the family farm) was not known at the address. These family farms were treated as ineligible.

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<sup>2</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 surveys.

- 43 family farms were not contacted because the address of the holding was incomplete and the telephone number of these family farms did not exist. These family farms were also treated as ineligible.

### **Multiple listing errors**

Altogether 47 family farms were listed twice. They were treated as ineligible.

### **Measurement errors**

Statistics corrects possible errors of measurement using the logic-numeric control. We are trying to avoid the measurement error by training of interviewers and supervisor, control data and process validation.

After data entry, extreme values of variables are checked and corrected if necessary.

### **Processing errors**

Due to use of administrative data we can not speak about processing errors for bovine animals and areas. We can only speak about processing errors by labour force. As a key variable we consider data on holder: gender, birth of year and working time.

### **Non-response errors**

Dealing with unit non-response is described in Chapter 3.5.3.

Item non-response was dealt with imputations (see Chapter 3.5.1)

### **Methods to estimate non-sampling errors**

In the field of agriculture we try to minimise non-sampling errors at data checking and control of the process.

### **Effects to the variance and bias due to non-sampling errors**

Because of quite a lot of data checking we do not expect noticeable effects due to non-sampling errors to the variance and bias.

### **3.5.4 Evaluation of results**

Since the administrative data were used for statistical purposes there were no other data sources to evaluate results of FSS 2007. We compared aggregated results with results of previous survey. The comparison of aggregated values showed no significant differences.

Data on labour force were compared with results of input of labour force in EEA.

## **4. PUBLICATION AND DISSEMINATION**

Preliminary results were published in paper version on 30 October 2007 (only crop data)

Final results will be published on 15 April 2011. Results comprise all final data. This issue will also be available on the web site of CBS ([www.dzs.hr](http://www.dzs.hr)). Micro data are available to the registered researchers under the same conditions as those from the Agricultural Census. Data disclosure is applied.

## **REFERENCES**

- Methodological Material for Interviewers and Supervisors, Farm Structure Survey 2007
- Results of Surveys, Agricultural Census, Croatia, 2003
- Rapid Reports, Preliminary Results of the FSS 2007 (only crop data)
- 

## **ANNEXES**

- Annex 1: Questionnaire for FSS 2007





**FARM STRUCTURE SURVEY**  
**FOR PRIVATE FAMILY FARMS IN 2007**

Obligation to report based on Article 38 Law on Official Statistics (NN, no. 103/03.). Refusal of information, providing incomplete and inaccurate information or withholding information within the prescribed time the penal provisions in Article 69 and 70 said Law. information you provide in this report will be used exclusively for statistical purposes and will not be published as an individual.

Kind of activity 1 P 9 2

Period

0 1

Year

20 0 7

(No. farm address book)

(county)

**1. DATA ON HOLDING**

Phone/ Mobile

**1. LABOUR FORCE (last 12 months)**

		gender 1 male 2 female	Relationship to the owner 1 holder 2 spouse 3 son/daughter 4 other relatives 5 unrelated	By the person who is the manager sign "x"	Age (1 st June 2007)	the average number of hours worked per day spent on agricultural activities 1 1 to 2 hours 2 2-4 3 4-6 4 over 6 hours 5 does not work on farm	Other gainful activity 1 as major occupation 2 as secondary occupation	Agricultural education 1 only practical experience 2 course 3 three-year secondary school 4 four-year secondary school 5 higher school or faculty
1	Holder	<input type="checkbox"/>	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9 More than 8 person enter the No. of persons

**Seasonal labour force**

10	male
11	female

No. of persons

working hours

**2. OTHER GAINFUL ACTIVITIES (last 12 months)**

(za potvrdni odgovor upiši znak "X")

1. Tourism, accommodation and other leisure activities
2. Handicraft
3. Processing of farm products
4. Wood processing
5. Contractual work
6. Other

**DO NOT COPY**  
**FORM IS READ OPTICAL**

Write like this: 0 1 2 3 4 5 6 7 8 9 X

**3. UTILISED AGRICULTURAL AREA,  
ARABLE LAND (1 st June)**

	ha	a
1	Wheat	
2	Maize	
3	Barley	
4	Rye	
5	Oats	
6	Triticale	
7	Ostale žitarice ( buckwheat, millet, sorghum)	
8	Early potatoes	
9	Other potatoes (late and seed)	
10	Peas, dry grain	
11	Beans, dry grain	
12	Soya beans	
13	Sunflower	
14	Rapeseed	
15	Other oilseeds	
16	Tobacco	
17	Sugar beet	
18	Fodder beet	
19	Lucerne	
20	Clover and mixtures	
21	Silage maize	
22	Fodder kale	
23	Grasses and mixture of grasses	
24	Grass-clover mixtures	
25	Other annual fodder crops	
26	Aromatic and medicinal plants and herbs	
27	VEGETABLES, TOTAL [see table 10, row 16 (a+b)]	
28	FLOWER AND ORNAMENTAL PLANTS [see table 10, row 18(a+b)]	
29	Seed (vegetable, sugar beet, fodder plants)	
30	Fallow land	
31	Osier willow	
32	ARABLE LAND, TOTAL (1- 31 )	
33	KITCHEN GARDEN [see table 10,row (16c + 18c)]	
34	MEADOW	
35	PASTURES - TOTAL	
36	- of that: rough grazings	
37	NURSERIES	
38	ORCHARDS - TOTAL (table 12 + table 13)	
39	VINEYARDS - TOTAL (see table 14, row 3)	
40	TOTAL (32+33+34+35+37+38+39)	

**4. LAND TENURE (1 st June 2007)**

	ha	a
1	owned	
2	rented in	
3	rented out	
4	TOTAL (1+2-3) (see table 3, row 40)	

**5. OTHER LAND (1 st June 2007)**

	ha	a
1	uncultivated agricultural land	
2	wooded land	
3	other unfertile land	
4	TOTAL (1+2+3)	

**6. TOTAL LAND OF FARM (1 st June 2007)**

	ha	a
1	TOTAL (table 4, row 4 + table 5, row 4)	

**7. IRRIGATED AREA(last 12 months)**

	ha	a
1	irrigable area	
2	irrigated area	

**8. Area treated with fertilizers (last 12 months)**

	ha	a
1	mineral	
2	organic	

**9. Area treated with pesticides(last 12 months)**

	ha	a
1	TOTAL	
2	- of that herbicides	
3	- of that insecticides	



**10. VEGETABLE, STRAWBERRIES AND FLOWERS (1 st June 2007)**

		on open fields (m <sup>2</sup> ) a	under glass (m <sup>2</sup> ) b	kitchen gardens (m <sup>2</sup> ) c
1	Onion and garlic			
2	Carrot			
3	Tomatoes			
4	Peas, fresh grain			
5	Melons and watermelons			
6	Cabbage and kale			
7	Lettuce			
8	Red pepper			
9	Cucumbers and gherkins			
10	Strawberries			
11	Beans, fresh grain			
12	Beetroot			
13	Cauliflower and broccoli			
14	Potatoes			
15	Other vegetables, n.e.s.			
16	VEGETABLE, TOTAL (1 - 15)			
17	- of that: production for market			
18	Flowers and ornamental plants			

**11. EXTENSIVE ORCHARDS (1 st 2007)**

		Total number of trees	fruit-bearing trees	(continued)		Total number of trees	fruit-bearing trees
1	Plums			10	Mandarins		
2	Apples			11	Lemons		
3	Pears			12	Quinces		
4	Sweet cherries			13	Walnuts		
5	Sour cherries			14	Almonds		
6	Peaches and nectarines			15	Hazelnuts		
7	Apricots			16	Olives		
8	Figs			17	Other (kiwi, chestnut and etc.)		
9	Oranges			18	Stone fruits		

**12. AREA OF EXTENSIVE ORCHARDS (1 st June 2007)**

		total area ha	a	fertile area ha	a
1	Extensive orchards				

**13. AREA OF ORCHARDS PLANTATIONS**

		total area ha	a	fertile area ha	a	(No. from address book)	(county)
1	Plantations						

14. VINEYARDS (1 st June 2007)

		total area		fertile areas		grapevines	
		ha	a	ha	a	totalj	fertile
1	Grapes for quality wines						
2	Grapes for other wines						
3	<b>TOTAL (1+2)</b>						
4	- of that: plantations						

15. SUBSEQUENT CROPS

		ha	a
1	Beans, dry grain		
2	Pumpkins (foder pumpkins)		
3	Potatoes		
4	Clover and mixtures		
5	Silage maize		
6	Cabbage		
7	Turnip rape		
8	Other		
9	<b>TOTAL ( 01- 08)</b>		

16. DESTINATION OF THE HOLDING'S PRODUCTION (last 12 months)

1	Household consumes more than 50% of the value of the final production of the holding	<input type="checkbox"/> for positive answer enter the sign "X"
2	Direct sale to final consumers represents more than 50% of the totalsales of the holding	

17. CHANGE OF NAME OR ADDRESS

In \_\_\_\_\_ date \_\_\_\_\_ 2007

Interviewer

18. LIVESTOCK (1 st June 2007) (probna tablica)

		number
1	Bovine animals, under one year old, male and female	
2	Goveda od 1 - 2 godine	male
3		female
4	Goveda 2 i više godina	male
5		heifers
6		dairy cows
7		other cows
8	<b>Bovine animals - total (1 - 7)</b>	
9	Piglets under 20 kg	
10	Breeding sows	
11	Other pigs	
12	<b>Pigs - total (9 - 11)</b>	
13	Sheep - breeding females	
14	Other sheep	
15	<b>Sheep - total (13+14)</b>	
16	Goats - breeding females	
17	Other goats	
18	<b>Goats - total (16+17)</b>	
19	<b>Horses - total</b>	
20	Broilers	
21	Laying hens	
22	Turkeys	
23	Ducks	
24	Geese	
25	Other poultry (ostriches, quails and etc.)	
26	<b>Poultry -total (20 - 25)</b>	
27	<b>Rabbits - total</b>	
28	<b>Bees (hives)</b>	
29	<b>Other animals, n.e.s.</b>	