



FARM STRUCTURE SURVEY 1999/2000
NATIONAL METHODOLOGICAL REPORT

Member State: IRELAND

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SUMMARY

In Ireland the Farm Structure Survey 2000 was a full census of agriculture. All agricultural and horticultural holdings were surveyed. The survey described the structure of the holdings as well as land use, livestock, workforce, machinery and certain other aspects of Irish agriculture. The Agriculture Division of the Central Statistics Office (CSO) in Ireland conducted the survey.

The basis for the survey was a set of administrative registers provided by the Department of Agriculture, Food and Rural Development (hereafter referred to as 'the Department'). These registers contained details of 98% of the farmers in the state. Details on the other 2% of farmers were obtained from an array of specialised registers provided by other agricultural agencies, and from the CSO's own farm register, dating back to Ireland's previous census of agriculture, in 1991.

The survey was conducted by post. In advance of the reference date, 1st June, a questionnaire was issued to every farmer in the state. Farmers were asked to complete the questionnaire and return it by post by the 9th June 2000. A telephone help desk was established in the CSO to assist farmers with queries. A significant number of farmers availed of this help desk to provide their data by phone.

Originally it was proposed to have four postal reminders to promote from farmers. Eventually six reminders were issued over the period June – October 2000. In a few cases it was necessary to contact some farmers by telephone. Due to a combination of increasingly stringent reminders and telephone calls Ireland achieved a response rate of 95% of farms.

Each return was coded, receipted, scrutinised and then entered onto the computer system using Viking – a data entry package with inbuilt controls for validating data entered. Once the individual returns were keyed they were edited electronically.

Various methods of imputation were used to estimate missing information. Most often missing information consisted of the unit used for area (acres or hectares), the district that the farm belongs to, the area farmed or the number of certain categories of livestock. Some of the larger farmers were contacted by telephone if their questionnaires were incomplete. In cases where no response was received and the farm was believed to be active administrative data were used to impute data.

Provisional results from the 2000 Census of Agriculture were published in a release entitled *Crops and Livestock Survey, June 2000 – Provisional Estimates*, in October 2000. These estimates were based on a matched sample methodology, using a subset of the returns received. They were published to meet Ireland's obligation to provide Eurostat with annual estimates of crops and livestock. Final results, based on all returns, were published in a publication entitled *Census of Agriculture, June 2000 – Main Results*, in December 2002. These consisted of county-level inventories of all census data plus detailed state-level structural analyses.

1. INTRODUCTION

1.1. History, scope

The CSO conducted the 2000 Census of Agriculture (COA) by post using administrative farm registers as the basis for identifying farmers. The previous Census in 1991 was conducted by interview immediately after the 1991 Census of Population. Both Censuses were conducted using very different approaches, principally arising from the changing national situation with regard to the availability of a register of farmers. The tendency in the conduct of the farm surveys during the 1990's has been to make increased use of existing administrative information, to reduce the response burden on farmers, to have access to an up-to-date register of farmers and to reduce the collection costs.

Prior to the 1991 Census, the CSO had been conducting sample surveys in a fixed set of enumeration districts. Up to 1987-1988 these surveys were conducted by personal interview. Temporary enumerators were recruited at local level before each survey. Each enumerator was required to interview every farmer within a particular geographical district. The local area districts accounted for one-quarter of the country and they were annually re-surveyed each June and December. The recruitment and supervision of these interviewers was undertaken by the local Police force. The system became untenable for a variety of reasons: cost, unwillingness of the Police to continue involvement given other priorities, informality of the field supervisory and enumerator procedures and rigidity of the sampling areas.

As part of an EU restructuring Plan, postal surveys were introduced in the fixed enumerator sampling areas during 1987-1988. The enumeration process involved collecting the name and address of each landowner. As part of the transition process, these were computerised to represent a register of landowners in the traditional fixed enumeration districts.

An interviewer-based Census of Agriculture was conducted in June 1991. The primary farm register used for the Census of Agriculture was the list of households and premises identified as farms during the 1991 Census of Population (conducted in April). This strategy reduced Census of Agriculture costs through the use of the Census of Population field forces, maps, etc. The Agriculture Division was thus saved the costly and time-consuming tasks of recruitment and payment of enumerators and supervisors, training, and much preparatory fieldwork.

The 1991 Census of Agriculture was used to create a complete register of all farmers in the State. This statistical farm register was maintained during the 1991-2000 period using a combination of direct farm surveys, register enquiries and analyses of changes to the main Department register. However, it proved impossible to maintain a fully up to date register of farmers based on two postal surveys of farmers in June and December and two register enquiries in March and September. The two main problems were identifying when a farm ceased operation and the creation of duplicate farms. Duplication of farms often arose when the name or address of a potential new farmer

obtained from land transactions data varied from the name or address listed in the premia register.

As the decade progressed it was possible to improve access to administrative farm registers. A decision was made to base the 2000 Census of Agriculture on these administrative registers, and to conduct it in such a manner as to facilitate continuing the methodology for subsequent sample farm surveys. An important advantage of using administrative registers is that they are updated weekly at a local level by the Department staff. Also they are becoming increasingly detailed and comprehensive as agricultural policy progresses. Thus a key objective of the 2000 Census was to identify a reliable method of using these registers for subsequent inter-censal surveys. Its function was not only to provide a benchmark for agricultural statistics for the present decade, but also to introduce a whole new methodology for collecting agricultural statistics.

1.2. Legislation

In Ireland agricultural surveys are normally conducted on a voluntary basis. The only exceptions are censuses of agriculture, which are conducted on a statutory basis.

The Statistics Act, 1993, which governs all the statistical activities of the CSO, makes provision for prescribing by order a requirement on persons and undertakings of particular classes to provide requested information. In advance of the census the Statistics (Census of Agriculture) Order, 2000, Statutory Instrument No. 132 of 2000, was enacted. This order came into effect on 1 June, the reference date of the census. It itemised in general terms the type of data that had to be provided, and the specific reference dates for that data. Under the Statistics Act, 1993, it was an offence for any farmer issued a census questionnaire to refuse to supply the requested information. The Act also guarantees the confidentiality of all data provided, expressly prohibiting the disclosure of information which can be related to any identifiable person or holding.

The Statistics Act, 1993 also grants the CSO right of access to records of public authorities for statistical purposes (with a number of exceptions). Specifically under the Act the CSO may request any public authority to consult and co-operate with (the CSO) for the purpose of assessing the potential of the records of the authority as a source of statistical information and, where appropriate and practicable, developing its recording methods and systems for statistical purposes. This underpinned co-operation with the Department on the subject of its farm registers.

To date this legislation has performed satisfactorily. No changes are anticipated in an agricultural context.

1.3. Main changes in the 1990's

- (1) To summarise the principal changes in the 1990's have been twofold:

- (2) Since 1991 there has been a movement from enumerator-based field surveys to postal surveys. In addition the telephone has become an increasingly important medium of collecting information, particularly in relation to specialised farms.
- (3) Increasing use has been made of administrative sources of information. The Census of Agriculture 2000 in particular represented a great step forward in this process.

2. CONTENT

2.1. Characteristics

The questionnaire collected information according to the Commission Decision of 18th May 1998 (98/377/EC). However there were minor differences in terminology, particularly in the case of machinery, to use descriptions familiar to Irish farmers.

In addition a significant amount of data was collected for national purposes only. Specifically this included:

- The subdivision of wheat, oats and barley into winter and spring varieties
- The subdivision of pasture and meadow into grass silage (1st to 4th year's and permanent), hay (1st to 4th year's and permanent) and pasture (rotation under 5 years and permanent)
- The subdivision of equidae into both thoroughbred and other horses (both brood mares and other in each case) and mules, jennets and asses.
- A different breakdown of bovine animals, including a 2 years old and under 3 years age category, bulls and the subdivision of heifers into dairy and other heifers.
- A more detailed breakdown of sheep, consisting of rams, ewes both 2 years and over and under 2, and other sheep, both 1 year and over and under 1 year.
- The subdivision of other pigs into boars and pigs 20kg and over.
- The subdivision of broilers into breeding birds and table birds and the subdivision of other poultry into turkeys (both table and breeding), geese, ducks and others.
- The subdivision of deer into breeding females and others.
- A more extensive machinery breakdown
- A question on milk quota

2.2. Questionnaire

The census employed an 8-page, A4-sized questionnaire (see annex). In content and design the questionnaire was almost identical to questionnaires

used for previous June surveys, and thus had an element of familiarity for many farmers.

An Irish language version of the questionnaire was also produced. This was made available to any farmers who indicated that they wished to provide their details through Irish.

In addition a supplementary pig questionnaire was produced and issued to specialised pig farmers in addition to the main census questionnaire. This requested a more detailed breakdown of pig categories.

3. SURVEY METHODOLOGY

3.1. Survey organisation

The Census of Agriculture 2000 was project-managed. The project manager was the head of the Agriculture Division in the CSO. The project team consisted of the project manager and three statisticians. The services of a fourth statistician were available on a part-time basis. In addition a project board was established to oversee the direction of the census. Apart from the project team the project board consisted of an expert in IT, an expert in human resources management, an expert in project management, an expert on mailing/printing, and an expert on survey methodology.

In terms of organisational structure the census was the responsibility of two sub-sections of the Agriculture Division, the Register Section and the Data Section. The Register section was responsible for creating and updating the census register, for the design and issue of the census questionnaire, for the receipting of returned questionnaires and for the issuing of reminder notices. The Data Section was responsible for scrutinising and editing returns. Data-entry duties were shared between the two sections. Both of these sections had other non-census duties to perform.

3.2. Work process

Key activities and timetables of the census project are given as follows:

Activity	Started	Finished
1. Consultation with government/Department etc.	June '98	Feb '00
2. Formation of project board	Dec '99	Sep '02
3. Recruitment and training	June '99	June '00
4. Design of questionnaire	Jan '00	Mar '00
5. Drawing up of national legislation	Feb '00	May '00
6. Creation of census register	Apr '00	May '00
7. Issuing of questionnaires and reminders	May '00	Sep '00
8. Receipting of returns	June '00	Sep '00
9. Scrutiny, data-entry and editing of returns	June '00	Apr '01
10. Publication of provisional results	Sep '00	Oct '00
11. Macro-level edits	May '01	Sep '01
12. Non-response imputation	Sep '01	June '02
13. Geographical coding	Sep '01	July '02
14. Results analysis	Dec '01	June '02
15. Provision of data to Eurostat	June '02	Oct '02
16. National publication of final results	Feb '02	Dec '02

3.3. Preparing the survey operations

('Planning the survey')

3.3.1. Population and frame

- **Population**

The target population of the Census of Agriculture 2000 was all agricultural holdings, irrespective of size. In the *Statistics (Census of Agriculture) Order, 2000* an agricultural holding was defined as an undertaking producing (a) horticultural or other crops and/or (b) cattle, sheep, pigs, poultry or other livestock.

- **Frame**

The frame of the census was built primarily around one administrative register; the Department's Main Client File. This was a list of the postal names and addresses of all the Department's clients, i.e. every person in the state who registered with the Department either to comply with current agricultural

regulations, or to avail of current agricultural subsidies. In practice this included the overwhelming majority of farmers. In total there were 180 574 records in this file (2 706 of these were quickly identified as duplicate entries). Each record had a Department reference number, known as a herd-number, attached.

In addition to the Main Client File the Department also provided 6 other registers. These consisted of pig farmers, poultry farmers, organic farmers, potato growers, REPS applicants and structural payments applicants. These registers combined contained over 196 000 records. However, when cross-referenced with the Main Client File over 191 000 matches were found (these 6 registers were not mutually exclusive). The balance, 4 935 records, were appended to the Main Client File.

A separate client file was provided by Teagasc, a semi-state farm advisory agency. This file contained over 156 000 records. The Teagasc file again contained postal names and addresses of its clients, and in addition contained a date-of-last-contact field, which was useful. Unfortunately, however, Teagasc did not use the Department's herd-number referencing system. Thus its client file could not be linked directly to the Main Client File/Department supplementary file register that had already been built up. Instead a decision was made to include only those farmers which had availed of Teagasc's services in the preceding 12 months, and whose name and address could not be found in the amalgamated Department registers by extensive string-searching techniques. Ultimately 6 144 Teagasc records were appended to the Department records.

A further 7 specialised registers were provided by Bord Glas, a semi-state horticultural body. These registers consisted of mushroom growers, potato growers, vegetable growers, bulb growers, soft fruit growers, top fruit growers and nurseries. All told these comprised some 3 000 names and addresses. Again these records did not contain herd-numbers and string searching had to be used to search for occurrences in the developing census register. Eventually 1 788 Bord Glas records were appended to the census frame.

Finally a small number of specialised farms from the CSO's pre-census farm register were added to the census frame. These included pig, poultry and deer farmers, and apple growers who could not be readily identified in the Department/Teagasc/Bord Glas records. These were added as a precautionary measure, to ensure that these important records in relatively unregulated areas were not lost. These comprised an additional 208 records.

When the building up of the census frame was complete (and the 2 706 duplicates identified in the Main Client File were eliminated) the complete census register stood at 191 573 records. This was held electronically as a SAS dataset, which could be accessed interactively by all staff.

At the time it was realised that this census register necessarily included redundant records. Results from previous structural surveys indicated that the total number of holdings in 2000 would converge at approximately 140 000. Thus an estimated over-coverage of more than 50 000 was expected. Had more time been available to examine the records this over-coverage could

have been reduced. Unfortunately delays in receiving the registers militated against this. In the final analysis such over-coverage was deemed acceptable, in that it minimised the risk of exclusion. It was considered that any duplicate returns would be detected at the processing stage.

3.3.2. Survey design

The census was a complete survey. Every identifiable agricultural holding was included.

A supplementary pig questionnaire was sent to a sample of 251 pig farmers. These were farmers who returned 200 or more breeding pigs, or 2000 or more total pigs, in one or more of the preceding four pig surveys (June 1998, December 1998, June 1999, December 1999).

3.3.3. Pilot Survey

A pilot survey was not considered necessary as the census questionnaire was almost identical to the June survey form, used successfully for the previous 9 years.

3.3.4. Informing and training the staff and respondents

New staff received most of their training on-the-job from their more experienced colleagues. In addition all staff attended a daylong telephone skills course, designed specifically to help them answer queries from farmers, and a two-week keyboard skills course, to prepare them for data-entry. New statisticians received formal training in SAS programming.

As the census unfolded staff were kept informed of developments through weekly briefing sessions and formal monthly meetings.

Publicity for the census was generally low-key. As many of the farmers to be surveyed were already familiar with the questionnaire a large publicity campaign was not perceived as necessary. However, support was requested from farmer representative organisations at liaison meetings and this was forthcoming. Farm journalists were also approached and a number of positive articles were written in the farming papers in advance of the census. Posters were printed and distributed to agricultural schools, veterinary offices and other suitable venues. Also a colourful promotional pamphlet was printed, with question and answer information, and was sent to every farmer along with his census questionnaire.

3.4. Sampling, data collection and data entry

3.4.1. Drawing the sample

The census was a complete enumeration.

3.4.2. Data collection

- **Data collection organisation:**

All data were collected by the Register section of the Agriculture Division, CSO.

- **Data collection methods:**

Each census questionnaire was issued with a pre-addressed freepost reply envelope. This envelope had a Post Office box number for ease of delivery. The advantage of this method was that census post was segregated from other post when it was delivered to the CSO. Also the Post Office was able to provide an exact count of how many envelopes were returned this way. Once within the CSO the top of each reply envelope was automatically slit for ease of access. The questionnaire within was then manually extracted for coding.

Each questionnaire was coded as either active or inactive, according to the information supplied by the respondent. The code was written on the front page of the questionnaire, along with the initials of the staff member who did the coding. The date of return was also stamped on the questionnaire. Differently coded returns were then sorted into separate piles. These were then sorted in reference number order and bundled into batches of 50.

Each batch of 50 was then receipted in the census register. This involved accessing the appropriate record for each form returned (the register was in reference number order, and the reference number of the farmer was printed on the front page of each form). The response code was keyed into a special field. The date of return and the initials of the staff member receipting were keyed into separate fields. Each night an update program was run on the register to insert the date of receipt into a fourth field. Receipting was analysed daily by a special program that produced a daily count and response rate to-date. These response rates were carefully monitored with a view to anticipating daily workloads and determining the optimum time to issue reminder notices.

A significant number of farmers provided their details over the phone (either because they rang the office expressing a preference to do so, or in response to a limited telephone follow-up). This was time-consuming for staff as frequently each question had to be explained in detail. On the other hand a full response to all questions could be ensured. Ultimately 1 952 questionnaires were completed this way.

In the whole of the census only 3 requests were received for the questionnaire in electronic format. Such a small demand vindicated an earlier decision not to invest resources in making this facility available.

In total 6 reminder notices were issued to non-respondents. The first reminder notice was issued in mid June. This was a short notice printed on a single page reminding the farmer that the return date had passed. A second notice was issued in mid July. This enclosed a second census questionnaire in case the first has been lost or damaged. The remaining 4 notices were issued in mid August, early September, early October and early November. The 3rd and 4th were similar to the 1st and 2nd respectively. The 5th and 6th were more stringent, indicating that the farmer had a legal obligation to respond and risked prosecution should he fail to do so.

During this process it became clear that the Department's Main Client File was not as up-to-date as had been expected. A large number of retired farmers, and even deceased farmers, were sent census questionnaires on foot of their occurrence within this file. These general findings were

communicated to the Department with a view to upgrading their register for the future (due to confidentiality constraints the situation of individual farmers could not be communicated to the Department).

On the whole the response from the farming community was very good. The overall response rate was 92%. The response rate for active farms was 95%.

- **Data entry modes:**

Data was keyed using a Viking data-entry system. This was a 'heads down' system, i.e. data was keyed without computer feedback. The only constraint imposed by the system was that each field had to be filled before the next field could be entered. All data entry was done in-house.

3.4.3. Control of the data

The individual data was controlled in three separate phases. These were the scrutiny phase, verification phase and electronic edit phase.

Scrutiny was a manual process undertaken by experienced staff. It entailed visually examining the returned questionnaire, page-by-page, question-by-question. Where an entry was only partially legible, it was made fully legible. Where a tick box was left unfilled, but a 'yes' or corresponding term was written beside it, then it was ticked as appropriate etc. Where an inconsistency was encountered, it was amended wherever possible. Where data were omitted returns from previous surveys could be examined for information. Full scrutiny/edit instructions are given in appendix 2. The function of scrutiny was to detect and rectify errors wherever possible in advance of data entry (and minimise the keying and re-keying of erroneous information) and to streamline the data entry process (making sure data is clearly legible etc.).

After scrutiny the data were keyed. Then the next control phase was begun. This was the verification phase. Verification was essentially the re-keying of data. Each questionnaire returned was keyed again, directly onto the electronic record created for it in data entry, manually overwriting each field at high speed. If any differences occurred between data originally keyed and data re-keyed then this was immediately signalled to the verifying staff member, and the re-keying was suspended. These differences were then examined in detail and after the correct version of the data was determined it was re-keyed carefully. Then re-keying was resumed at high speed. Thus the verification phase acted as a control on data entry. It ensured that all data were keyed correctly.

The third control phase was the edit phase. This was an electronic version of the scrutiny phase, checking totals versus subtotals, that data returned were within acceptable ranges and cross-data consistency (see appendix 2 again). Returns were edited in batches of 1 000.

Of the three phases scrutiny generally took the longest time. Scrutiny served as the foundation for all other controls, and it was found that time invested in this phase saved much unnecessary work further on. Verification was the easiest phase. However it required very experienced keying staff. Editing

served as a higher-level control of the data. Editing was normally carried out by supervisors.

3.4.4. Non-response

The principal tool used to tackle non-response was the issuing of reminder notices. Six reminder notices were issued in total. The fifth and sixth of these were particularly strongly worded. The fifth was a statutory notice directing the recipient to return his questionnaire. It stated that failure to do so was an offence under the *Statistics Act 1993*, and that the individual in question was liable to a fine of up to IR£1 000 on summary conviction or IR£20 000 on conviction on indictment. The sixth reminder was a final notice repeating this wording. In practice it was eventually decided not to take legal proceedings against non-respondents. For one thing the number of non-respondents was too large (over 14 000), the majority of whom in any case were not believed to be still active in farming. Also it was felt that the adverse publicity that could result from widespread legal action would greatly undermine future co-operation from the farming community.

A limited telephone follow-up was also undertaken. This focused exclusively on large farm non-respondents. Every farmer of 100 hectares or more (as determined from returns in previous surveys) who had not responded within two months of the reference date was phoned if possible. Generally once contact was made the response was very favourable. However it was not possible to obtain up-to-date phone numbers for all farmers. Also many farmers were unavailable during office hours. On the whole, considering the time and expense involved, it was not deemed worthwhile to extend the phone follow-up to non-respondents with less than 100 hectares.

Occasionally farmers who returned only partial information would also be phoned. This typically applied when only when farmers were very big or had specialised livestock. Limited staff resources precluded a full-scale phone follow-up to resolve partial non-response.

When active farmers were contacted the usual reason they cited for their non-response to date was the burden of completing the questionnaire. Outright refusals were very rare (there were only 6 cases of explicit refusal in the whole of the census). Also many non-respondents explained that they were no longer involved in farming and therefore did not see a need to return their questionnaires.

3.5. Data processing, analysis and estimation

(‘Analysing and correcting the collected data’)

3.5.1. Methods for handling missing or incorrect data items

Missing information fell into two broad categories; that resulting from only partially complete returns and that resulting from no return being made whatsoever. Two separate methodologies were developed for handling both of these problems. These were known as the partial imputation methodology and the full imputation methodology respectively. Both methodologies depended upon the use of the Department’s 2 000 payments file.

The Department's payments file was a record of every farmer in the country who received a payment pertaining to agricultural activity in the year 2000. This itemised the number of animals for which he received payment under the various premia, suckler, slaughter and headage schemes, and the amount of land for which he received payments under area aid schemes etc. In total there were over 139 000 records on this file, 122 000 of which could be directly linked to the census register by Department herd-number (the remainder were farmers who had since been issued new herd-numbers). Thus, in the great majority of cases, individual administrative data could be compared directly with census returns. This comparison formed the basis of both imputation methodologies.

In the case of a partial return being made administrative data were used to estimate for the missing items. For instance if a farmer left the questions on cattle blank on his census questionnaire, but the payments file indicated that he had received either beef premia or cattle headage payments, then cattle were imputed for him. The actual amount of cattle imputed in each category (dairy cows, other cows, males under 1 year etc.) were determined by aggregate ratios for these categories to beef premia animals and cattle headage animals. These aggregate ratios were applied to the individual beef premia animals and cattle headage animals of the farmer in question, to estimate the number of dairy cows, other cows etc. he should have returned. Similar procedures were employed to partially impute sheep, goats and horses. In total, using this methodology, 3 611 farms had data imputed in one or more of these livestock categories.

In the case of no return being made the payments file was used to identify active, as opposed to inactive, non-respondents (the rationale being that if a non-respondent was in receipt of a premia-type payment from the Department, then clearly he was active). A total of 6 149 full non-respondents were identified using this criterion. Here a different method of estimating their individual activity was used. An 'administrative best fit' was found with a full respondent in the same geographical area. This administrative best fit was a farm with identical, or as closely matching as possible, administrative data. The census data returned for this best fit were then duplicated for the non-respondent. This duplication method was used as it was impossible to generate data such as farm workforce, machinery and most varieties of crops from payments data.

Smaller, more specialised, imputation methodologies were developed for pigs, poultry, potatoes and sugar beet. Pigs and poultry data, where missing, could usually be estimated from returns made in previous and/or subsequent special surveys, adjusted in accordance with the overall trend. Very accurate data on missing individual potato growers were provided by Bord Glas. Sugar beet data were imputed from information supplied by Irish Sugar plc.

3.5.2. Estimation and sampling errors

Not applicable in a census.

3.5.3. Non sampling errors

On the whole the principal problem of the census was over-coverage rather than under-coverage. The amalgamation of different registers, from several different sources, in a relatively short space of time, inevitably meant that some farmers were surveyed twice. Generally such farmers made this known, and sent back their surplus questionnaire with their completed one. However a significant number of farmers sent back separately completed questionnaires, separately, without signalling so. When all returns were data-entered an extensive search was undertaken for duplication. Identical phone numbers and herd-numbers were the principal means of finding duplication. Thereafter farms in the same geographical location with broadly the same numbers and types of livestock and crops were investigated for possible duplication. All told some 1 600 duplicate returns were found and removed.

3.5.4. Evaluation of estimates

Wherever it was possible census data were also compared with administrative data at macro-level. For instance extensive comparisons were made between total census sheep numbers and total Department ewe premia animals. However in general such comparisons were handicapped by differences in definitions and periods of reference, and as such were of limited relevance from a validation point of view. Exceptions were comparisons with Bord Glas potato figures and Irish Sugar plc sugar beet figures. Both of these sets of figures compared directly with census figures and were compiled by experienced field force by the respective agencies. These comparisons were invaluable in the imputation processes for these two items.

4. PUBLICATION AND DISSEMINATION

The census results were published nationally in two separate phases; provisional results and final results.

- **Provisional results**

Provisional results were published on 18th October 2000, in a release *entitled Crops and Livestock Survey, June 2000 – Provisional Estimates*.

These were state level estimates of the principal crop and livestock categories, namely wheat, oats, barley, potatoes, cattle, sheep and pigs. These estimates were calculated using a matched sample method, on a sample of some 14 000 farms.

- **Final results**

Final results were published on 20th December 2002, in a publication entitled *Census of Agriculture, June 2000 – Main Results*.

These included detailed county level results of all aspects of agricultural activity covered in the census. In addition to the crops varieties published in the provisional estimates they included results for sugar beet, fodder beet, turnips, kale and field cabbage, other vegetables and fruit. Results were also

published for silage, hay and pasture. Both the area of the crop and the number of farms growing the crop were published. Crop areas were given to the nearest hectare (as opposed to the nearest 100 hectares in the provisional estimates) and farms were given to the nearest ten.

Livestock data published in the final results included the categories published in the provisional estimates, plus results for poultry, deer, goats and horses. Again all data was given at county level. And again both livestock numbers and the numbers of farms with these livestock were published, given by head (as opposed to the nearest 100 head in the provisional estimates) and to the nearest ten farms respectively.

County level results were also published for various farm sizes categories, characteristics of holder, the number of farm workers, labour input, farm machinery, land fragmentation, use of commonage, use of rented land, organic farms, woodland, gainful non-agricultural activities and milk quota.

Final results also contained detailed structural analyses. These analyses cross-classified farm size, type of farm, economic size of farm size and characteristics of holder, at state level. They also classified areas under crops for the principal crop varieties and by size of herd for the principal livestock categories by farm size, type of farm and economic size of farm. Labour input, the numbers of family workers and regular non-family workers and the level of training of farm managers were also classified by these farm characteristics.

Detailed analyses of the farm workforce were also presented, classifying family and non-family affiliation of workers and labour input by age, gender, labour input, importance of farm work.

Explanatory notes accompanied the tables of results, giving an overview of the census methodology and commenting on the principal changes to emerge between 1991 and 2000. A copy of the census questionnaire was also included as well as a summary description of the EU farm typology system, and its adaptation for Irish use.

5. SUGGESTIONS FOR FURTHER TASKS

Perhaps the greatest single requirement for the coming decade, to emerge from the experience of census 2000, is the need to play an active role in developing administrative registers for statistical uses.

Administrative registers are evolving rapidly, being driven by new regulations, new controls and new IT systems. Their data are becoming both more comprehensive and reliable from a statistical point of view. What has been lacking to date, however, is a full understanding of statistical requirements on the part of compilers of administrative registers. Important data from a statistical perspective, which are readily available to administrators, are often not compiled, or at least not compiled in a usable format, because they do not have an immediate use from an administrative viewpoint.

Furthering contact with administrative bodies, understanding their methodologies, understanding the limitations of their data, explaining statistical needs, seeking provision of these needs, lending statistical

expertise where required, and above all ensuring statistical considerations are taken into account when systems are developed, are the challenges for the future.

The extent to which these challenges are met will shape the inter-censal surveys of the decade and indeed the methodology of the next census.