



## <Carlos Coimbra>

# <Running the Portuguese Agricultural Census in the Pandemic Crisis>

<Carlos Coimbra<sup>1,2</sup>>; <João Varela<sup>1</sup>>; <Carlos Santos<sup>1</sup>>; <Carlos Carvalho<sup>1</sup>>

- <sup>1</sup> <Statistics Portugal>
- <sup>2</sup> <ISCTE Instituto Unversitário de Lisboa>

## Abstract:

Each ten years EU carries out an agricultural census. In Portugal the data collection for the new edition started by the end of 2019 and was planned to last until the end of the first half of 2020. However the conditions for data collection changed radically in March 2020 due to the COVID-19 pandemic, when a stringent confinement was imposed. How was then possible to conclude it? During a brief period the use of phone call for conducting the survey was tested. After checking its reliability, this mean for data collection was implemented and generally it was well accepted by the respondents. As the limitations on mobility were somewhat alleviated in May, face-to-face interviews were reintroduced, obeying to a strict protocol of the Health National Authority, mostly to ensure the exhaustiveness of the census. However, due the pandemic it was only possible to conclude the data collection 5 months after the planned schedule.

## Keywords:

Agricultural Census; Data collection; Covid-19 Pandemic crisis.>

## 1. Introduction:

In Portugal, as in many other countries, the data from Agricultural Census (AC) is the backbone of agriculture statistics. It aims to:

Characterize the farm structure;

Get acquaintance with agricultural production systems;

Set out the main agricultural practices;

Provide information on the origin of the producer's income;

Describe and characterize the family labour population and farm labour force;

Collect data related to rural development and other non-farm gainful activities;

Report on the agricultural farm succession;

Establish the Agricultural Sampling Base (BAA) for the agricultural surveys.

Indeed the agricultural census has a long history and it is one of the oldest official statistical operations. Thus, farmers, and in general Portuguese public opinion, are used to this type of statistical operation. Typically, the local authorities of rural areas, the farmers associations, local media, and even religious organisations cooperate with Statistics Portugal in the AC, particularly in remembering the farmers the need to respond.

Furthermore, the Portuguese AC is held within the EU statistical framework (Regulations (EU) 2018/1091 of the European Parliament and of the Council of 18 July 2018 on integrated farm statistics), allowing comparisons among Member States and obtaining pertinent information for Common Agriculture Policy.

So, in general, there is a friendly environment to conduct the AC. But something went wrong. In March 2020, after having collected data in about half of the farms, the first deaths related to COVID-19 pandemic were recorded and a stringent confinement was imposed in Portugal. The data collection stopped as it was done through face-to-face interviews. So at that point in time, when it was uncertain how long and how the pandemic would evolve, there was a considerable risk on the continuity of the AC. How then to proceed? An obvious solution would be to adapt the survey to phone calls. After all, this collection was and is used guite often in a great number of statistical surveys but was it viable for an AC? It had to be checked. Thus in addition to necessary adjustments in the operational logistic (mainly, additional training of the staff of approximately one thousand collaborators and changes in the supporting IT), a trial was conducted to see how reliable was this new way for data collection. And all of this would have to be done in a very short period of time in order to obtain data for the AC reference time span. The results of the trial, conducted during two weeks and obtaining more than 20 thousand responses, were positive and surprised even the most optimistic of AC staff team. Therefore, by the end of April, the data collection by phone was fully implemented. One month later, under a strict protocol of the Health National Authority, the face-to-face interviews restarted. Even so, given its acceptance by the farmers, the phone continued to be the main mode for responding to the AC. The face-toface interviews where mostly used to ensure the exhaustiveness of the census when it was not possible to use the phone or to check and clarify doubts of previous phone interviews. Despite the implementation of the new data collection mode, the pandemic with its heterogeneous and unsynchronised effects across the rural areas, led to an extension of 5 more months the data collection period to be entirely certain that no farm was left behind. The next section of the paper describes the trial, the third section mentions some of the results obtained and the last section concludes.

## 2. Methodology

The trial was conducted during the first two weeks of April 2020, and there were two types of checks. The first related to the degree of acceptance by the potential survey respondents. The second consisted on the evaluation of the reliability of the results obtained.

## 2.1. The acceptance

The goal was to contact 30 thousand agricultural holdings by telephone, but at the end of the test it was not possible to establish contact with 9,671 (32%), mainly due to the absence of valid telephone/missed calls (85%), unavailability of the producers (11%) or a clear incapacity to carry the interview out by telephone (5%). With a response rate of 68%, it was clear that the telephone interview could be used but it would not fully replace face-to-face interview.

The daily average in the test period was 1,477 interviews. The daily number of telephone interviews conducted per interviewer throughout the test was 1.5, very similar to that observed in the face-to-face data collection (1.4 daily interviews per interviewer) at the time of interruption.

Regarding the receptivity of the agricultural holder to this contact and the way the interview took place, the assessment was carried out by the interviewers and determined from a discrete scale from 1 to 6, with 1 corresponding to poor receptivity/bad interview and 6 to good receptivity/good interview. The general assessment was that the interviewers mostly classified the receptivity of agricultural holders in the maximum level, with an average value of 5.29, and that the evaluation of the way the interview took place also warranted the higher level of classification for most interviewers, with an average value of 5.17 (see figure below, where the left graph indicates the degree of friendliness of the phone contact and the right graph refers to interviewer evaluation of the quality of the interviews). Thus, this information was an encouragement to implement this mode of response.



#### Figure 1: Assessment of the telephone interview by the interviewers

## 2.2. The reliability of the data collection

The evaluation of the quality of the collected data was done using as reference correspondent data from administrative registers provided by public agencies related to agriculture.

In fact, for a set of relevant variables<sup>1</sup> in the Portuguese agriculture, a triple comparison was done. The first consisted in calculating the deviations of the data collected by phone relatively to administrative data. The second corresponded to the deviations of face-to-face collected data from administrative data, before the interruption of face-to-face collection. Finally the two types of deviations were compared.

In general the sign of the deviations was the same with an outlier, the pigs' livestock. However, in Portugal this type of livestock is concentrated in few holdings (1.1% of the holdings produce almost 90% of the total), and mainly in a single region, which could have led to this bias.

Bovine animals Bos taurus, L.;

<sup>&</sup>lt;sup>1</sup> Variables selected were the following and representing more than half of the total standard output:

Utilised agricultural area (UAA) - Total area taken up by arable land, permanent grassland, permanent crops and kitchen gardens used by the holding, regardless of the type of tenure or of whether it is used as a part of common land;

<sup>&</sup>lt;u>Non-dairy cows</u> - Female bovine animals which have already calved (including those less than 2 years old) and which, by reason of their breed or particular qualities, are kept exclusively or principally for the production of calves and whose milk is not intended for human consumption nor for processing into dairy products;

**Dairy cows** - Female bovine animals which have already calved (including those less than two years old) and which, by reason of their breed or particular qualities, are kept exclusively or principally to produce milk for human consumption or for processing into dairy products;

Pigs - Domestic swine animals (Sus scrofa domesticus);

**<sup>&</sup>lt;u>Sheep</u>** - Domestic animals of the species *Ovis aries L*;

<sup>&</sup>lt;u>Goats</u> - Domestic animals of the subspecies Capra aegagrus hircus L;

Hives - Occupied by bees (Apis mellifera L.).kept for the production of honey;

Olive trees (Olea europea L.) grown for the production of olives (for producing olive oil or for producing table olives);

Maize (Zea mays L.) harvested for grain, as seed or as corn-cob-mix;

Apples Orchards of Malus spp.;

Tomatoes Licopersicon esculentum;

Almonds (runus dulcis (Mill.) D.A. Webb.]

Also, the different magnitudes of the deviations could not lead to the consideration that the data from phone calls was statistically implausible.

The next figure shows the relative deviations vis-a-vis the reference (administrative) data for the two types of data collection, As it can be seen the points tend to be aligned with the bisector and present a linear correlation coefficient of 0,90 (which increases to 0,96 if the outlier is not considered).



## Figure 2: Deviations from administrative data>

So in the consequence of the trial and the perspective to restart the face-to-face interviews as soon as possible, not only to cover the part of farmers not answering to phone calls but also to clarify doubts raised by phone interviews, it was decided to generalize the phone interviews.

## 3. Results

The use of phone interviews and the term extension allowed the conclusion of the field operations in the beginning of November. In December Statistics Portugal published the main results of the AC and in 31<sup>st</sup> March 2021 released a detailed publication.

The results were welcome by the public agencies, farmers associations, and by the specialized media. In general the results were in line with the indications provided by previous sample surveys on specific areas of agricultural activities during the decade. Notably, the AC confirmed the increase of the average holding size and economic dimension. Agricultural land use has changed, with a decrease of 11.6% in arable land, that has been more than offset by the expressive increases of permanent crops (+ 24.6%) and permanent grassland (+14.9%). There was a strong investment in the installation, modernization and irrigation of olive groves and orchards, mainly of berries, subtropical and almond fruits. For the livestock, the results pointed out for an increase of the number of heads per holding. In the case of pigs, the increase occurred not only in size dimension of the holding but also in total number of heads (+15.5% vis-à-vis the previous AC), a result aligned with administrative register (+4%) and quite different from the one obtained during the trial.

## 4. Discussion and Conclusion:

The field data collection for the Portuguese Agricultural Census by Statistics Portugal begun in last quarter of 2019 and was planned to finish by the second quarter of 2020. In March 2020, when about half of that work was done, Covid-19 pandemic struck the country. Even so the data collection continued and was completed.

Two elements were crucial to overcome the difficulties: firstly, the introduction of phone calls interviews and, secondly, the term postponing of five months for the field work.

However this was only possible due to two other less evident elements: the good cooperation of farmers, who have understood constrains caused by the pandemic; and the high degree of flexibility and commitment of the statistical structure supporting the AC.

## References:

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