Mexico - National Agricultural Survey 2019

Instituto Nacional de Estadística y Geografía, Dirección General de Estadísticas Económicas, Dirección General Adjunta de Censos Económicos y Agropecuarios

Report generated on: January 25, 2023

Identification

SURVEY ID NUMBER
MEX_2019_ENA_v01_EN_M_v01_A_OCS

TITLE
National Agricultural Survey 2019

COUNTRY

Name	Country code
Mexico	MEX

STUDY TYPE
Agricultural Census [ag/census]

SERIES INFORMATION
The ENA 2019 represents the fourth exercise in a series that began seven years ago due to the need to establish an agricultural information system that would integrate information from censuses and continuous surveys.

In 1930, the first Agricultural, Livestock and Forestry Census of Mexico was carried out and it continued to be carried out every 10 years (1940, 1950, 1960, 1970, 1981), until 1991. Subsequently, an information gap of 16 years was created. years, since it was not until 2007 when the next Agricultural, Livestock and Forestry Census was carried out, which, by the way, is the last Census of this type that has been carried out in the country.

Therefore, given the need to have agricultural and forestry statistics with greater continuity, in 2012 the first National Agricultural Survey (ENA 2012) was carried out and from then on it is suggested that this survey be carried out biennially, therefore that in 2014 the second National Agricultural Survey 2014 (ENA 2014) was carried out.

Subsequently, it had been proposed to carry out the Agricultural, Livestock and Forestry Census in 2017, so the first stage was scheduled for 2016, which is the updating of the framework as a preparatory stage for said Census. Consequently, the 2016 National Agricultural Survey was not scheduled. However, since the budget for the census event in 2017 was not authorized, INEGI decided to carry out the third National Agricultural Survey (ENA 2017).

In 2019, the fourth National Agricultural Survey (ENA 2019) was carried out, which has been conceived to obtain statistics that allow for an overview of the small and medium-sized units of agricultural production in the country, as an invaluable input that allows defining and better evaluate public policies on priority and strategic programs established by the Federal Government.

ABSTRACT
The National Institute of Statistics and Geography (INEGI) carried out the National Agricultural Survey 2019 (ENA 2019) to offer statistics on the production of crops and livestock species that are characterized by being the ones that mostly participate in the Gross Domestic Product of the primary sector in Mexico and which, according to the Sustainable Rural Development Law, are those products for which the State seeks the supply, promoting their access to less favored social groups. Likewise, the Food and Agriculture Organization of the United Nations (FAO) considers them essential for food security, agricultural sustainability and rural development.

The ENA 2019 allows to continue obtaining basic and structural statistics of the agricultural and livestock sector, as it is the fourth version of a series of National Agricultural Surveys that INEGI carried out in the years 2012, 2014 and 2017. This survey, in addition to allowing to know The current characteristics of the agricultural production units has been enriched in terms of the results achieved, because, for some priority crops in the Federal Government programs, data was obtained from the small and medium-sized units that have the smallest area planted in the country.

KIND OF DATA
Sample Survey Data [ssd]

UNIT OF ANALYSIS
For ENA 2019, the Observation Unit is defined as the economic unit made up of one or more pieces of land located in the same municipality, where at least some of them carry out agricultural or forestry activities, under the control of the same administration. If the administration has land located in another municipality, it is considered as another production unit; that is, there will be as many production units as municipalities occupying their land.

Scope

NOTES
Agriculture and Livestock

TOPICS

Topic
- Legal category of the land
- Organization and support for production
- Classification of the production unit
- General characteristics of the land
- Land use
- Irrigation systems, quality and origin of water
- Agriculture
- Breeding and exploitation of animals
- Tractors, machinery and vehicles
- Labor and wages
- Credit and insurance
- Computer and communication technologies
- Problems that affect production
- Actions to protect the environment
- Sociodemographic characteristics of the producer

KEYWORDS

Keyword
Production Unit
Legal category
Land
Organization
Ground
Irrigation
Water
Agriculture
Crops
Animal husbandry
Cattle
Cattle
Pigs
Poultry
Tractors
Machinery

Vehicles
Labor
Remuneration
Credit
Insurance
Tecnology
Environment
Productor

Coverage

GEOGRAPHIC COVERAGE
National and by Federative Entity.

UNIVERSE
The universe selected for the ENA 2019 was 79,252 production-product units, equivalent to 69,124 production units from which information of interest was obtained. These units come from the Update of the 2016 Agricultural Census Framework (AMCA 2016) and updated with information from the 2017 National Agricultural Survey (ENA 2017). This universe was defined from the 28 products of national interest, 5 of these livestock products being of economic importance for the country.

The products selected for the conformation of the universe of work of the ENA 2019 are 29 products, 24 agricultural: Avocado, Alfalfa, Amaranth, Rice, Cocoa, Coffee, Pumpkin, Sugar Cane, Onion, Chile, Strawberry, Bean, Tomato (Tomato Red), Lemon, White Corn, Yellow Corn, Mango, Apple, Orange, Banana, Sorghum, Soya, Wheat and Grape; while the five species and livestock products were made up of Bovines, Porcine, Poultry, Milk and Egg.

Producers and sponsors

PRIMARY INVESTIGATORS

Name
Instituto Nacional de Estadística y Geografía
Dirección General de Estadísticas Económicas
Dirección General Adjunta de Censos Económicos y Agropecuarios

PRODUCERS

Name
Secretaría de Agricultura y Desarrollo Rural

FUNDING AGENCY/SPONSOR

Name	Abbreviation
Instituto Nacional de Estadística y Geografía	INEGI
Secretaría de Agricultura y Desarrollo Rural	SADER

Sampling

SAMPLING PROCEDURE
SAMPLE DESIGN

The elements considered for the definition and construction of the sampling scheme of the 2019 National Agricultural Survey (ENA 2019), help determine the size, selection and distribution of the sample; Necessary and substantial elements to define the precision of the information, as well as the analysis of the uptake for the evaluation of the final estimates, through calculations such as the variance and the coefficient of variation.

TARGET POPULATION
It is defined by all production units captured in the 2016 Agricultural Census Framework Update (AMCA 2016), updated with information from the 2017 National Agricultural Survey (ENA 2017) for the part of agricultural products and for the part of livestock producers it is taken of the 2007 Agricultural, Livestock and Forestry Census updated with the 2017 ENA that reported, at that time, producing any of the products of interest, classified according to their importance of national and/or state interest.

GEOGRAPHICAL AND SECTOR COVERAGE
The survey was designed to obtain information at the national level for the products of interest and for each of the states for their main products.

DOMAIN OF STUDY
It refers to subsets of the population under study for which it is intended to obtain information and for which a sample is designed independently for each of them.
In this regard, it is worth mentioning that of the 29 products of the ENA 2019 work universe, 26 had a stratified probabilistic design (for purposes of the sample design, corn counts as a single product regardless of whether it is white grain corn or yellow grain corn , reason for which there are 26 and not 27 products); while for poultry and egg products, a non-probabilistic design was considered. The subsets under study are presented below:
A. NATIONAL DOMAIN. Each of the 26 products by producer size (large and small and medium producers), obtaining a total of 52 domains, the products considered (Avocado, Alfalfa, Amaranth, Rice, Cattle, Cocoa, Coffee, Pumpkin, Sugarcane, Onion, Chile, Strawberry, Bean, Tomato (Red tomato), Milk, Lemon, Corn, Mango, Apple, Orange, Banana, Pork, Sorghum, Soy, Wheat, Grape).
B. PRODUCT-FEDERAL ENTITY DOMAIN. For the main federal entities by producer size, for this case 60 product-federal entity domains were considered.
C. DOMAIN PRODUCT-FEDERAL ENTITY-SIZE OF PRODUCTION UNIT BY AREA. (For ten products, the federative entity domain-size of production unit per area is necessary) for this case, 384 domains were considered.

SAMPLING UNIT
The observation unit is the Production Unit (UDP), defined as: The economic unit made up of one or more pieces of land located in the same municipality, where at least some of them carry out agricultural or forestry activities, under the control of the same administration. Under this context, the sampling unit is the production-product unit. If the production unit has more than one product or crop, it will be included in two or more study domains.

SAMPLING FRAME
It was integrated from two different sources:
A. AGRICULTURAL PRODUCTS: the framework derived from the AMCA 2016, updated with the results of the ENA 2017, was the input for determining the sampling framework of the ENA 2019.
B. LIVESTOCK PRODUCTS: the 2007 Agricultural, Livestock and Forestry Census, updated with the results of the 2017 ENA.

STRATIFICATION
For agricultural products, the variable of interest for stratification was the planted area in hectares (ha), depending on the characteristics of the crop, from four to six strata. The determination of the ranges of the strata is obtained by the Dalenius-Hodges method. According to William G. Cochran (1977), "for a single feature or variable, the best feature is, of course, the frequency distribution. The next best is probably the frequency distribution, given the number of strata, the equations for determining the best limits between them under Neyman proportional assignment, have been obtained by Dalenius (1957)". For livestock products, the number of heads variable was used.

SAMPLING SCHEME
For the products of interest, both large and small and medium producers, the sampling design is stratified probabilistic with simple random selection within each study domain:
A. PROBABILISTIC. The selection units had a known, non-zero probability of being selected.
B. STRATIFIED. Sampling units with similar characteristics were grouped to form strata.
The results of the sample are generalized to the entire population and it is possible to know the precision of the results.

SAMPLE SIZE
Different sample sizes were calculated for:
A. SAMPLE SIZE FOR DOMAINS AT THE NATIONAL LEVEL (PRODUCT). For products of national interest, the sample size

obtained for these domains is 19,320 production-product units; 10,968 for large producers and 8,352 for small and medium producers.
B. SAMPLE SIZES FOR DOMAINS AT THE PRODUCT-FEDERAL ENTITY LEVEL. For products of state interest, the sample size obtained for these domains is 19,320 production-product units; 10,968 for large producers and 8,352 for small and medium producers.
C. SAMPLE SIZES FOR DOMAINS AT THE PRODUCT-FEDERAL ENTITY-SIZE OF PRODUCTION UNIT LEVEL BY AREA. In this case, the calculation differentiated by producer size was made, in such a way that the sample size for small and medium-sized producers was strengthened, according to the following considerations:
Yo. DOMAIN OF LARGE PRODUCERS. The sample size obtained for these domains is 3,255 production-product units.
ii. DOMAIN OF SMALL AND MEDIUM PRODUCERS. The sample size obtained for these domains is 7,355 production-product units.
D. SAMPLE SIZES FOR LIVESTOCK PRODUCTS
Yo. DOMAIN OF LARGE PRODUCERS. For the bovine product, a relative error of 14% was considered for the national design sample.
ii. The sample size obtained for these domains is 10,554 units. The interest of bovines is both the number of stocks and milk production.

SAMPLE ALLOCATION.
For the three large levels of interest, (National (product), Product-federative entity and Product-federative entity-size of production unit by area). The sample was assigned in each stratum by the Neyman method according to the planted area or number of heads. Except for small and medium-sized producers in the domains at the product-federative entity-size of production unit per area level.

SAMPLE SELECTION
It is performed randomly and independently for each study domain. The sample selected for the design is 79,252 production-product units, equivalent to 69,124 production units in which information of interest is obtained.

CALCULATION OF EXPANSION FACTORS
Three different types of expansion factors were calculated, which are:
A. Production-product unit expansion factors (for each production-product unit)
B. Production unit expansion factors (based on design expansion factors for production-product units)
C. Producer expansion factors (for each producer, based on design expansion factors for production-product units)

ADJUSTMENT TO EXPANSION FACTORS
A. Expansion factors for the non-response rate. The expansion factors at the production unit-product level are corrected for non-response at the stratum level, because some of the production units that were selected did not answer.
B. Calibration of expansion factors for avocado. In surveys, the use of auxiliary information can greatly improve the precision of estimates for a whole population. To incorporate the auxiliary information in the estimates, there is a method proposed by Deville and Sarndal; which proposes the use of calibrated estimators, with the idea of obtaining a better estimate for the population. The calibration estimators that were used for the following purposes:
- Decreased variance.
- Eliminate or decrease selection biases caused by unit non-response or frame errors.
- Force estimates to be numerically consistent with external measures or auxiliary information.
In the case of avocado, INEGI has implemented a process to estimate the area planted using satellite images in the main states of the country, with the aim of measuring the underreporting that was observed by producers in past national agricultural surveys.
In order to give consistent estimates of the information collected, in the analysis of satellite images, the expansion factor calibration method is used for the advantages mentioned above.

ESTIMATORS
A. Estimators at the production unit-product level (For cattle, pigs and corn, due to the high probability of finding in most production units the combination of these products with any other of interest in the survey).
B. Estimators at the production unit level (characteristic of production units)
C. Producer level estimators (proportions, rates and averages)

CALCULATION OF PRECISION INDICATORS
A. Calculation of variance at the production unit-product level (The estimate of the variance of the total characteristic)
B. Calculation of variance at the production unit and producer level (The estimation of the variance, standard deviation and coefficient of variation for the total characteristic at the production and producer level)
C. Level of precision of the estimates (The information obtained will be published in statistical tables, to facilitate its consultation. For each data, the indicators of statistical precision are disclosed (standard error, confidence interval and coefficient of variation (CV))) The estimates are colored according to their level of precision, in High, Moderate and Low,

taking as reference the coefficient of variation (%). A Low precision requires a cautious use of the estimate. The levels considered are, High CV in the range of (0-20), Moderate CV in the range of [20,30) and Low CV from 30% onwards)

* For further details of this section, consult the document Encuesta Nacional Agropecuaria 2019. ENA. Methodology. Same as found in the External Reference Materials of this documentation.

DEVIATIONS FROM THE SAMPLE DESIGN

The non-response that was presented in the ENA 2019 was 8.7%, (8.1% of Producers not collected, which is equivalent to 8.7% of UP), caused mainly by two reasons: The first was that the production units selected by some crop or livestock species, at the time of the interview they were no longer engaged in any agricultural activity, due to abandonment of these units. The second reason was the fact of not finding or being able to locate the informant of the production unit, for which reason the information was not collected.

RESPONSE RATE

The response rate for the different types of domains such as: national level (product), state product-federal entity, product-federative entity-size of production unit per area of large producers; for livestock products in the domain of large, medium and small producers; The calculation was performed independently for each domain, taking a confidence level of 95%, a relative error of 9% and an Expected Non-Response Rate (NRR) of 30%, using the expression in stratified sampling. to estimate a total.

For the product-federative entity-size of production unit per surface area of the domain of small and medium-sized producers, taking a confidence level of 95%, a relative error of 12%, a proportion of 50% and TNR of 15%, using the use of the expression in stratified sampling to estimate a proportion.

WEIGHTING

EXPANSION FACTORS OF PRODUCTION UNITS-PRODUCT

Expansion factors are defined for each unit of production-product.

PRODUCTION UNIT EXPANSION FACTORS

Expansion factors are defined for each production unit, based on the design expansion factors for the production-product units.

PRODUCER EXPANSION FACTORS

Expansion factors are defined for each producer, based on the design expansion factors for the production-product units.

* For more details on the Expansion Factors of the Production-Product Units, Production Units, and Producers, see the document Encuesta Nacional Agropecuaria 2019. ENA. Methodology. Same as found in the External Reference Materials of this documentatio

Data Collection

DATES OF DATA COLLECTION

Start	End	Cycle
2019-04-01	2019-07-31	Questionnaire design
2019-06-17	2019-10-04	Pre-recruitment activities
2019-10-07	2019-10-18	operational training
2019-10-21	2019-11-29	Information training
2019-12-02	2019-12-31	Closing of operation
2019-11-04	2020-03-31	Process and analysis
2020-04-01	2020-04-17	Calculation of expansion factors, sample expansion and analysis of the result of the statistical design
2020-04-20	2020-04-30	Generation of tables and comparison with other sources
2020-04-20	2020-04-30	Calculation of tables with indicators of statistical precision

2020-05-04	2020-07-13	Analysis and delivery of results (priority and non-priority) INEGI-SADER

TIME PERIODS

Start date	End date	Cycle
2018-10-01	2019-09-30	Legal category of the land, Organization and support for production, Classification of the production unit, General characteristics of the land, Land use, Irrigation systems, Water quality and origin, Open-air agriculture, Organic agriculture, Protected agriculture , Fertilizers and fertilizers, Production destination, Food loss, Marketing, Agricultural technologies, Agricultural facilities, Production sales, Tractors, Manpower, Wages and salaries, Credit and insurance, Information and communication technologies, Problems that affect production, Actions to protect the environment
2014-01-01	2019-09-30	Environmental factors
2019-09-30	2019-09-30	Livestock stocks, Machinery and equipment
2019-03-31	2019-03-31	Livestock stocks

DATA COLLECTION MODE

Computer Assisted Personal Interview [capi]

SUPERVISION

The commitment to obtain reliable information required actions to timely detect and correct inconsistencies in its collection, and thus avoid interference in the quality of the data and in the coverage of the operation.

The advisory and support activity consisted of going to observe how the interviewers obtained the requested data, to ensure that they adhered to the established methodology, detect deviations and correct them immediately. The record of the detected situations was carried out by means of a certificate.

The supervisors had the instruction to align and redirect the procedures for: the development of the interview, the conformation of the production unit and the application of the questionnaire.

DATA COLLECTION NOTES

NATIONAL GEOSTATISTICAL FRAMEWORK

It is a unique and national system designed by the INEGI, to correctly reference the statistical information of the censuses and surveys with the corresponding geographical places, it provides the location of the towns, municipalities and federal entities of the country, using geographic coordinates.

The National Geostatistical Framework (MGN) used in the ENA 2019, is made up of the results of the Update of the Agricultural Census Framework (AMCA) carried out in 2016 and complemented with information from the 2017 National Agricultural Survey. This Framework integrates the new municipalities created until December 2018.

Based on this Framework, the cartographic materials used in the field data collection operation were generated.

For the ENA 2019, it was considered to use mainly digital cartography preloaded in Mobile Computing Devices (DCM), as well as the printing of some cartographic materials that facilitated the interviewers the location of localities and addresses of the producers.

The cartography in digital format was integrated into the cartographic module, installed in the DCM used by the interviewers, which contained information on municipalities, rural and urban localities, streets, blocks, Basic Geostatistical Areas (AGEB), streams and bodies of water, routes of communication, and physical and cultural traits.

The main layers of digital cartographic files used corresponded to:
- MGN vectors (federative entity, municipality, AGEB).
- Vectors of the urban MGN (blocks, directions of roads).
- Vectors of urban services (markets, schools, medical services, among others).
- Vectorial topographic chart 1:50,000 (rivers, streams, roads, trails, dams, etc.).
- Vectors of urban and rural localities.
- MGN catalogs and derivatives (municipalities and municipal capitals, AGEB, General Integral Catalog of Towns, among others).

THE PRINTED CARTOGRAPHIC PRODUCTS USED WERE:

State Condensed with Geostatistical Framework
Municipal Sketch with Geostatistical Framework
Urban Location Plan
Urban Basic Geostatistical Area Plan (AGEB)
Rural Town Plan

GEOGRAPHIC COVERAGE
The ENA 2019 had a national geographic coverage and by federal entity. It included a sample of the Production Units that are dedicated to agricultural activities and that have some of the selected products with national and/or state representation.

The coverage of municipalities was 1,663, which correspond to the addresses of the total number of producers visited.

RECRUITMENT STRATEGY
The recruitment strategy by directed visit was used, which consisted of going to the homes of the producers or suitable informants and, through a direct interview, the data of the producers were corroborated and completed, the location of their production units was confirmed and the variables of interest were captured.
To obtain the data from the production units, Mobile Computing Devices were used, which had the Information Capture System installed, which was made up of the following three modules:

OPERATIONAL ROUTINE: it made possible the identification of the producer, the registration and control of the situations presented in the field, capturing the characteristics of how each interview was developed.

CARTOGRAPHIC MODULE: used to visually verify the location of the domiciles of the producers and dotting them on the cartography, which allowed obtaining geographic coordinates of the domiciles, which will be very useful in future statistical projects of the sector.
DIGITAL QUESTIONNAIRE: made it possible to fill out the questionnaire smoothly, validating the answers at the time of the interview, thus ensuring the quality of the data collected

INFORMATION TRAINING SYSTEM

OPERATING ROUTINE
- Allows to identify whether or not the producer managed the production unit in the reference period.
- Takes control of the situations presented in the field with each producer.
- Prepare follow-up reports.

CARTOGRAPHIC MODULE
- It allows to georeference the location of the houses of the producers.

QUESTIONNAIRE MODULE
- Captures the variables of interest.
- Perform validations to take care of quality.
- Encodes the variables.

RECRUITMENT PROCESS
In this process, we went to the address of each producer registered in the directory to carry out a direct interview; The interviewers inquired to identify the producer or the appropriate informant, that is, who knew the management of the production unit and could answer the interview.

TRAINING
Training is of great relevance for any project of this nature, the preparation of the operational personnel, responsible for capturing the data, depends on it. To the extent that the elements of the event are better assimilated, the interviewers will be able to adhere to the guidelines and make decisions in the field that support the quality of the information collected.

In the ENA 2019 training, knowledge was transmitted about the methodological support, the conceptual framework, the operating procedures, the capture instruments and the management of the capture system.

For the survey, the face-to-face training strategy was used at two levels: central and state, with the following characteristics:
- Direct communication between instructor and trainee was promoted, which facilitated continuous feedback.
- The manuals included the specific functions and procedures to be carried out by each position and, together with the use of presentations, didactic material, classroom exercises and field practices, provided the knowledge and learning required for the development of the activities.

- The two levels of training were carried out as follows: central instructors to state instructors and state instructors to operational personnel.
- A total of 1,190 people were trained, of which 882 were interviewers.

MONITORING AND CONTROL
With the registration of the situations found in the field during the collection of information, progress reports were prepared, which were generated directly in the DCM, which facilitated the monitoring of progress control during the operation to ensure that, in all planned units, capture the questionnaire or identify the reasons why the data was not captured.
With each sending of information that the interviewers made from their DCM, through the Web, the reports were automatically updated for all those responsible for the control and monitoring of the field operation.

The system developed for the monitoring and control of progress contributed to the immediate solution of the problem, which prevented it from impacting the results and coverage of the ENA 2019.

DATA COLLECTORS

Name	Abbreviation
Instituto Nacional de Estadística y Geografía	INEGI

Questionnaires

QUESTIONNAIRES
The collection of statistical information from the ENA 2019 was carried out through a Questionnaire.This instrument was published in Spanish and is structured by pre-coded questions and some open questions. The application of the questionnaire was carried out through electronic means and on paper in special cases.

Data Processing

DATA EDITING
ANALYSIS AND PROCESSING OF INFORMATION
The processing and analysis of the information represents a fundamental part to guarantee the quality, consistency, completeness and timeliness of the information generated in census statistical events or agricultural samples.

For the 2019 National Agricultural Survey (ENA 2019), specific information processing activities were contemplated in order to guarantee its consistency and quality. The validation and analysis processes were carried out from the moment of the interview with validation criteria in the Mobile Computing Device (DCM) directly with the informant, until the review and presentation of the results.

Due to the above, the information collected in the ENA 2019, was subjected to a set of processes to identify data that does not meet the requirements of logical and arithmetic consistency, completeness and integrity, in order to apply a solution under specific and homogeneous criteria, that ensure the consistency and quality of the information.

Within the processing of the ENA 2019, various stages were defined to carry out the analysis and validation of the information. The processing stages were as follows:
- Online validation
- Monitoring
- Codification and Normalization
- Validation within the questionnaire
- Validation between questionnaires
- Comparison with internal and external sources

ONLINE VALIDATION
Online validation is the first stage of the processing and had the purpose of detecting and solving inconsistencies in the information at the time of the interview directly with the informant, this during the application of the questionnaire with the DCM. This validation allowed that once the interviewer has recorded the data provided by the informant, if the system detected any inconsistency, it would send an error message to be corrected at that time with the informant. The online validation criteria were more than 200. These were designed to guarantee that the questionnaire had the minimum necessary information, detect variables without answers, as well as validate the breakdowns of the destination of crop production, livestock stocks, among others.

Once the capture of the questionnaires was completed, the information was transferred via the Internet to the national capture database of INEGI central offices.

MONITORING
The monitoring of the information was carried out at the same time as the field operation and with the information from the capture database. Its objective was to follow up on the information collected in the questionnaires and verify its completeness during the field operation, in order to detect in a timely manner inconsistencies in the collection of information that were not detected during the online validation. In the same way, it served as an alert system to monitor the quality and completeness of the information and offered elements to reinstruct the operational personnel in case of omissions or repetitive failures in the capture of information.

CODING OF CONCEPTS
For the generation of statistics, it is necessary that the information collected from each variable is cataloged for its proper classification and is identified for its integration into the database, for its processing, analysis, as well as for an orderly presentation of results.

In agricultural statistics (censuses and surveys), catalogs are used to classify the response options for each variable contained in the questionnaire; The catalogs contain codified concepts that are developed from the investigation and analysis of each variable, to integrate the answer options, as many as it is feasible for the informants to answer, according to the characteristics of each question in the questionnaire.
The first coding was done at the time of the interview, since the mobile computing device had the catalogs integrated, in such a way that, during the interview, the device allowed the catalog to be displayed from which the interviewer could choose the concept according to the response of the producer, when choosing a concept from the catalog integrated into the mobile computing device, at that moment the key of the concept chosen from the catalog was stored. In the cases in which the answer provided by the informant did not coincide with any of the concepts in the catalogue, the capture system made it possible to capture the answer and all these cases were coded once the captured information was integrated into a database, using two processes: electronic coding and manual coding.

The questionnaires captured in the mobile computing device of each interviewer were transferred weekly to the database concentrated at the state level and each state coordination was transferred in turn to a national database, integrated in the central offices of the Institute.

The information already concentrated in the central office database was processed by a system and those cases that were not coded at the time of capture because they were not located in the catalog at the time of the interview were electronically coded. that is to say, by means of an automated electronic system, the concepts captured with the contents in the catalogs were compared to make a filter that would allow detecting those cases that were coincidental and that for some reason at the time of the interview were not located, by this means electronically, the cases were automatically coded with those described in the catalogues.

After the electronic coding process, the cases that were pending coding are transferred to manual coding. In this process, they are grouped by type of catalog for review and analysis by central office staff, where synonyms with concepts that if they are contained in the catalog or they had an erroneous writing at the time of their capture; these were assigned the corresponding key of the concept contained in the catalogue; on the other hand, the cases that were identified as new, after review, analysis and investigation, including consultations with staff from state offices, were assigned a new code and registered in the corresponding catalog for their coding.

STANDARDIZATION
In Mexico throughout its territory there are various regionalisms and the units of measurement that refer to surface and volume are no exception. The information that is captured in the agricultural statistics and that corresponds to quantitative variables, which refer to extensions of surface or to quantify the capacity or volume. In some cases, agricultural producers express them in measures that are not always of the metric system (meters, hectares, liters, kilograms, tons, etc.), depending on the geographical location in which they are located, they provide regional units that they usually use in their community, such as almud, tarea, media, rope, among other measures.

For the publication of results it is necessary to homogenize the measurements to the decimal metric system, this homogenization process is called Normalization, in this process the units of measurement other than the decimal metric system are reviewed and analyzed and an equivalence is applied to carry out a conversion to the measurements with which they will be published (hectares, tons, liters, etc.).
First, an electronic normalization is carried out, which, through an automated electronic process, converts the units of measurement that are of fixed equivalence (square meter, yard, acre, pound, gallon, etc.), to units of measurement that are presented in the published results: liter, meter or hectare, kilogram or ton, depending on the variable in question such as the planted area, harvested area or production.

On the other hand, in manual normalization, all captured units that do not correspond to the decimal metric system and that do not have an established equivalence are analyzed and investigated, since their value can vary, depending on the region where they have been captured. In these cases, once their equivalence is determined through an exhaustive investigation and having verified their consistency with other variables, their value is converted to publishable measurement units, thus homogenizing the values to be able to add the information and present it in the results. of the poll.

VALIDATION INSIDE THE QUESTIONNAIRE
The validation within the questionnaire guarantees the consistency of the information within it, verifying the congruence between related variables. For this, there was a significant number of logical validations that were applied to each of the questionnaires. This process was carried out once the previous coding and normalization processes were released. Therefore, the validation within the questionnaire, and for each one of them, began with the standardized information and was executed until no questionnaire presented errors or discrepancies according to the established criteria. In ENA 2019, 157 validation criteria were developed.

For the validation within questionnaires, it was established that the 'theoretical vectors' method was used, in which functions were previously defined where their dependent variables were assigned values according to the questions and answers of each chapter of the questionnaire. . From these values, the functions provided a set of 'images' that corresponded to all the possible combinations of answers to the questions under study, each image identifying one and only one combination. Subsequently, each image was subjected to an analysis and correction methodology for any inconsistencies that could arise, in such a way that the records that did not meet the established criteria would be automatically corrected in some cases and in others diagnosed for manual debugging.

VALIDATION BETWEEN QUESTIONNAIRES
The validation processing stage between questionnaires had as objective that the information was consistent in a grouped way. For this, an analysis was carried out between different groups defined according to the main activity or the size of the production unit, etc.; such as, for example: corn production units or livestock production units with an affinity for some species, with this it was possible to detect records that showed different behavior in certain variables with respect to the group to which they belong. This was done by applying statistical tools to grouped data such as multivariate and univariate analysis. For the univariate analysis, the intervals between which the data of these variables could fluctuate without departing from the average behavior of the others were statistically defined. The intervals were used to detect all those production units that recorded atypical data when leaving the delimited fluctuation, that is, all those data whose dimension was higher or lower than what is recorded by the predetermined average behavior of the others. On the other hand, for the multivariate analysis, the variables that were correlated and dependent on each other were defined; Based on this, the production units with atypicalities in the grouped behavior of said variables were detected.

The validation between questionnaires was carried out by having all the questionnaires coded and standardized. This stage was developed at the same time as the validation within the questionnaires, as the entire base was standardized, and continued until the end of the processing. In the cases that were inconsistent, a report was prepared to analyze their automatic or manual debugging if necessary.

During the internal validation stages and between questionnaires, a re-consultation system was available, which allowed an exchange of information to be carried out between the central and state levels, in relation to the cases reported as inconsistent so that they could be analyzed by the state. and if it was considered necessary to reconsult them in the field directly with the informant, to ratify the data or apply adjustments to them.

COMPARISON WITH INTERNAL AND EXTERNAL SOURCES
In order to guarantee the quality of the information captured by the ENA 2019, it was important to carry out a comparison of information with that generated by other sources, both internal and from institutions related to the Agricultural Sector. The sources of consultation used were the following:

INTERNAL SOURCES: information from the 2007 census and 2012, 2014 and 2017 Agricultural Surveys.

EXTERNAL SOURCES: information from SIAP-SADER, SEMARNAT, CONAGUA, RAN, etc.

The aforementioned confrontation was carried out at two levels, national and state, based on the priority given to certain variables, such as: area, crops, production, yields, cattle head inventories, etc.

For the above, it was necessary to have the diagnostic or preliminary tabulations, which would allow carrying out the corresponding analysis in terms of corroborating the expanded sample figures, as well as carrying out re-consultations with the producers, in order to determine if the information was correct. or the pertinent adjustments had to be made and, in the last case, the corresponding justification should be made.

Finally, this activity made it possible to detect similarities and/or differences in the expanded statistical data, or to determine if these differences were due to conceptual or operational aspects.

Access policy

CONTACTS

Name	Affiliation	Email	URL
Atención a usuarios	INEGI	atencion.usuarios@inegi.org.mx	Link

CONFIDENTIALITY

Conforme a las disposiciones de la Ley del Sistema Nacional de Información Estadística y Geográfica en vigor: ARTÍCULO 37.- "Los datos que proporcionen para fines estadísticos los Informantes del Sistema a las Unidades en términos de la presente Ley, serán estrictamente confidenciales y bajo ninguna circunstancia podrán utilizarse para otro fin que no sea el estadístico. El Instituto no deberá proporcionar a persona alguna, los datos a que se refiere este artículo para fines fiscales, judiciales, administrativos o de cualquier otra índole." ARTÍCULO 38.- "Los datos e informes que los Informantes del Sistema proporcionen para fines estadísticos y que provengan de registros administrativos, serán manejados observando los principios de confidencialidad y reserva, por lo que no podrán divulgarse en ningún caso en forma nominativa o individualizada, ni harán prueba ante autoridad judicial o administrativa, incluyendo la fiscal, en juicio o fuera de él. Cuando se deba divulgar la información a que se refiere el párrafo anterior, ésta deberá estar agregada de tal manera que no se pueda identificar a los Informantes del Sistema y, en general, a las personas físicas o morales objeto de la información. El Instituto expedirá las normas que aseguren la correcta difusión y el acceso del público a la Información, con apego a lo dispuesto en este artículo". ARTÍCULO 45.- "Los Informantes del Sistema estarán obligados a proporcionar, con veracidad y oportunidad, los datos e informes que les soliciten las autoridades competentes para fines estadísticos, censales y geográficos, y prestarán apoyo a las mismas. La participación y colaboración de los habitantes de la República en el levantamiento de los censos, será obligatoria y gratuita en los términos señalados en el artículo 5o. de la Constitución Política de los Estados Unidos Mexicanos. Los propietarios, poseedores o usufructuarios de predios ubicados en el territorio nacional, prestarán apoyo en los trabajos de campo que realicen las autoridades para captar Información." ARTÍCULO 47.- "Los datos que proporcionen los Informantes del Sistema, serán confidenciales en términos de esta Ley y de las reglas generales que conforme a ella dicte el Instituto. La Información no queda sujeta a la Ley Federal de Transparencia y Acceso a la Información Pública Gubernamental, sino que se dará a conocer y se conservará en los términos previstos en la presente Ley. Sin perjuicio de lo señalado en el párrafo anterior, el Instituto, respecto de la información correspondiente a su gestión administrativa, quedará sujeto a lo dispuesto en la Ley Federal de Transparencia y Acceso a la Información Pública Gubernamental."

ACCESS CONDITIONS

There is no access to microdata publicly or by agreement. However, INEGI provides several ways to access the microdata, as well as the descriptor file that provides the necessary information for the management of the databases, through the following link:

https://www.inegi.org.mx/datos/default.html#Microdatos

CITATION REQUIREMENTS

INEGI. Encuesta Nacional Agropecuaria 2019.

ACCESS AUTHORITY

Name	Affiliation	Email	URL
INEGI	Organismo Autónomo del Gobierno Federal	atencion.usuarios@inegi.org.mx	www.inegi.org.mx

Disclaimer and copyrights

DISCLAIMER

NOTICE TO THE USER

By using the information from the National Institute of Statistics and Geography (INEGI), you expressly accept the following:

FREE USE TERMS OF INEGI INFORMATION

1. The user:

a) You can make and distribute copies of the information, without altering or deleting its metadata.

b) You can disseminate and publish the information.

c) You can adapt and rearrange the information.

d) You can extract all or part of the information.

e) You can commercially exploit the information, using it as an input to generate other products or services.

f) You must grant the corresponding credits to INEGI as author, and when technically possible, mention the source of the information extraction as follows: "Source: INEGI, name of the product from which the information is extracted" and, where appropriate. update date, example: "Source: INEGI, ENA 2017".

g) You must not use the information in order to deceive or confuse the population, changing its original meaning and its veracity.

h) It must not appear that the use made of the information represents an official position of INEGI or that it is endorsed, integrated, sponsored or supported by the source of origin.

2. INEGI will not be responsible for the interpretation and application that the user makes of the results obtained through the use of the information; therefore, any decision based on its interpretation excludes INEGI from any responsibility. Likewise, INEGI will not be responsible for the differences obtained due to precisions, rounding or numerical truncation, as well as for technical or technological changes that may affect such results.

3. The validity of these Terms of Free Use is for an indefinite period provided that the previous provisions are not contravened.

4. The unauthorized use in contravention of these Terms of Free Use, may be penalized in accordance with the applicable current legislation.

5. These Terms of Free Use are governed by the Law of the National System of Statistical and Geographic Information, as well as by the applicable regulations in the matter, in case of controversy, the user expressly agrees to submit to the jurisdiction and competence of the Federal Courts of Mexico City, Federal District, waiving the jurisdiction that may correspond to him by reason of present or future domicile or any other cause.

6. INEGI reserves the right to modify these Terms of Free Use at any time.

Metadata production

DDI DOCUMENT ID
DDI_MEX_2019_ENA_v01_EN_M_v01_A_OCS

PRODUCERS

Name	Abbreviation	Role
Instituto Nacional de Estadística y Geografía	INEGI	Metadata producer
Dirección General de Estadísticas Económicas	DGEE	Metadata producer
Dirección General Adjunta de Censos Económicos y Agropecuarios	DGACEA	Metadata producer
Dirección de Censos y Encuestas Agropecuarias	DCEA	Metadata producer
Coordinación de Diseño Conceptual y Resultados	CDCR	Metadata producer
Subdirección de Diseño Conceptual	SDC	Metadata producer

Office of Chief Statistician	OCS	Metadata adapted for FAM

DDI DOCUMENT VERSION
MEX_2019_ENA_v01_EN_M_v01_A_OCS_v01

Data Description

Data file	Cases	Variables
ENA-2019 Información del sector agropecuario captada por la ENA 2019 en 63,828 unidades de producción. La base de datos consta de 605 variables y comprende la siguiente temática: - Categoría jurídica - Organización y apoyo - Clasificación de la unidad de producción - Características generales de los terrenos - Uso del suelo - Sistemas de riego, calidad y origen del agua - Agricultura - Cría y explotación de animales - Tractores, maquinaria y vehículos - Mano de obra y remuneraciones - Crédito y seguro - Tecnologías informáticas y de comunicación - Problemática - Medio ambiente - Características sociodemográficas del productor	1	605