



# Chickens and Eggs Methodology and Quality Measures

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**Scope and Purpose:** The Annual Chickens and Eggs report is conducted in all States that have qualifying operations. The target population consists of all known contractors and independent producers who have at least 20,000 table egg layers, flocks of hatchery supply layers, or pullet only operations with at least 500 pullets. These operations are also contacted monthly except those with less than 30,000 table egg layers.

Data are summarized for all operations in the target population. Estimates are published for rate of lay and egg production, chicken inventories, and value of production at a National and State level. The publication contains combined estimates for 34 States with low levels of production labeled as “Other States”.

**Survey Timeline:** The reference date for the Annual Chickens and Eggs Report is December 1 with a data collection period of approximately two weeks. States complete data collection, analysis, summarization, and submission of estimates during the month of January. During this time a National review is completed, and National estimates are established. Estimates are released to the public in late February on the date designated by the Agricultural Statistics Board (ASB) on its annual publications calendar.

**Sampling:** This survey is a complete census of the qualifying records described above on the NASS List Sampling Frame. The List Frame is a current and unduplicated list of agricultural operations, and all current layer and egg operations are assumed to be on the list. If a new layer and egg operation is found at any time, the operation is added to the List Frame. Since this is a census of layer and egg operations, all sample weights are equal to one. Each operation accounts only for itself.

**Data Collection:** All federal data collections require approval by the Office of Management and Budget (OMB). NASS must document the public need for the data, apply sound statistical practice, prove the data does not already exist elsewhere, and ensure the public is not excessively burdened. The questionnaire must display an active OMB number that gives NASS the authority to conduct the survey, a statement of the purpose of the survey and the use of the data being collected, a response burden statement that gives an estimate of the time required to complete the form, a confidentiality statement that the respondent’s information will only be used for statistical purposes in combination with other producers, and a statement saying that response to the survey is voluntary and not required by law.

All Regional Field Offices (RFO) use the same, standardized questionnaire for data collection. For consistency across modes, the paper version is considered the master questionnaire and the web-based self-interview and Computer Assisted Telephone Interview (CATI) instruments are built to model the paper instrument. Questionnaire content and format are evaluated annually through a specifications process where requests for changes are evaluated and approved or disapproved.

Sampled operations receive a pre-survey letter explaining the purpose and importance of the survey and that they are being contacted for survey purposes only. Attached to the letter is a complete copy of the paper questionnaire and a pass code to complete the survey securely online. RFOs are responsible for their data collection strategy which must include provisions for respondents to report securely online. If a response is not received by mail or online, respondents are contacted by CATI. Limited personal interviewing may be conducted, generally for large operations or those with special handling arrangements.

**Survey Edit:** As survey data are collected and captured, they are edited for consistency and reasonableness using automated systems. Relationships between data items on the current survey are verified and in certain situations those

items may be compared to data from earlier surveys to make sure certain relationships are logical. The edit will determine the status of each record to be either “dirty” or “clean”. Dirty records must be updated and reedited or certified by an analyst to be clean. If updates are needed, they are reedited interactively. Only clean records are eligible for analysis and summary.

**Analysis Tools:** Edited data are processed through an interactive analysis tool which displays data for all reports by item. The tool provides scatter plots, tables, charts, and special tabulations that allow the analyst to compare an individual record to similar records. Outliers and unusual data relationships become evident and assigned RFO staff review them to determine if they are correct. The tool allows comparison to an operation’s previously reported data to detect large changes in the operation. Data found to be in error are corrected, while data found to be correct are retained.

**Nonsampling Errors:** Nonsampling errors are present in any survey process. These errors include reporting, recording, and editing errors. Steps are taken to minimize these errors, such as comprehensive interviewer training, validation, and verification of processing systems, application of detailed computer edits, and evaluation of the data via the analysis tools.

**Estimators:** The Annual Chickens and Eggs Report is a complete enumeration of all known layer and egg operations. Layer and egg operations are selected from the list of all agricultural operations, and new operations are added into the sample when discovered. No coverage adjustment is made.

Response to the Chickens and Eggs Report is voluntary. Producers may refuse to participate in the survey, may not be located during the data collection period, or may submit incomplete reports. The nonresponse data items and units are manually imputed by RFO statisticians. The weights for current items are not adjusted. Since manual imputation is conducted for all nonresponse units and items, point estimates are an accounting of all responses and manual imputations. The measurement of error due to sampling in the current survey period is irrelevant for a fully enumerated census. Moreover, standard errors and coefficients of variation (CVs) are zero for all current data items collected.

**Estimation:** When all samples are accounted, all responses fully edited and the analysis material is reviewed, each assigned RFO executes a summary to evaluate and analyze the data under its responsibility. Since identical surveys are conducted in each State, the samples can be pooled, and National survey results computed. The summary results provide multiple indications and information to assess the performance of the current survey and evaluate the quality of survey indications, such as response rates and strata level expansions. RFOs are responsible for performing a detailed review of their survey results. Any irregularities revealed by the summary must be investigated and, if necessary, resolved. Assigned RFOs interpret the survey results and submit a recommended estimate to Headquarters for rate of lay and egg production, number of hatching type layers, chicken inventories, potential layers by geographic region, production by type during each month, and value per head and total value statistics. NASS assembles a panel of statisticians to serve as the ASB, which reviews the National results and establishes the National estimates. The ASB follows the same approach the assigned RFOs do in determining the National estimate.

Previous year’s estimates are subject to revision when current year’s estimates are set. Revisions are the result of late reports or corrected data. Every five years, NASS conducts the Census of Agriculture, which is an exhaustive data collection effort for all known farm operations across the United States. Estimates are thoroughly reviewed for possible revision after data from the Census of Agriculture are available. The information gathered from the Census of Agriculture is used to establish benchmark levels by which the survey estimates can be compared, and bias determined.

## Quality Metrics for Chickens and Eggs

**Purpose and Definitions:** Under the guidance of the Statistical Policy Office of the OMB, NASS provides data users with quality metrics for its published data series. The metrics tables below describe the performance data for surveys contributing to the publication. The accuracy of data products may be evaluated through sampling and nonsampling error. There is no sampling error present for this survey since it is a census of the target population; however, nonsampling error is evaluated.

**Sample size** is the number of observations selected from the population to represent a characteristic of the population. Operations that did not have the item of interest or were out of business at the time of data collection have been excluded.

**Response rate** is the proportion of the above sample that responds to the survey.

**Weighted item response rate** is a ratio of reported survey data expanded by the original sampling weight compared to final nonresponse adjusted summary totals.

**Chickens and Eggs Report Sample Size and Response Rates:** To assist in evaluating the performance of the estimates in the Chickens and Eggs report, the sample size and response rates are displayed. Response rates overall for 2019 and 2020 are displayed.

**Chickens and Eggs Survey Sample Size and Response Rate - States and United States:  
December 1, 2019-2020**

State	Sample size		Response rate	
	2019 (number)	2020 (number)	2019 (percent)	2020 (percent)
Alabama .....	27	26	74.1	57.7
Arkansas .....	83	69	96.4	68.1
California .....	35	35	71.4	60.0
Colorado .....	8	5	62.5	80.0
Georgia .....	37	34	67.6	70.6
Illinois .....	13	13	84.6	84.6
Indiana .....	25	35	68.0	60.0
Iowa .....	48	41	79.2	68.3
Kentucky .....	18	11	72.2	72.7
Louisiana .....	7	7	71.4	100.0
Maryland .....	9	8	44.4	37.5
Massachusetts .....	(D)	(D)	(D)	(D)
Michigan .....	12	11	83.3	81.8
Minnesota .....	19	17	68.4	47.1
Mississippi .....	16	14	75.0	78.6
Missouri .....	139	171	89.9	77.8
Montana .....	28	28	92.9	96.4
Nebraska .....	8	4	75.0	75.0
New York .....	17	17	58.8	47.1
North Carolina .....	32	23	81.3	82.6
Ohio .....	40	47	60.0	59.6
Oklahoma .....	18	14	72.2	78.6
Oregon .....	6	5	83.3	80.0
Pennsylvania .....	100	101	53.0	63.4
South Carolina .....	8	8	50.0	75.0
South Dakota .....	7	7	57.1	85.7
Tennessee .....	18	14	72.2	64.3
Texas .....	32	29	68.8	72.4
Utah .....	5	5	80.0	80.0
Vermont .....	(D)	(D)	(D)	(D)
Virginia .....	10	9	80.0	88.9
Washington .....	9	9	88.9	88.9
West Virginia .....	4	3	50.0	66.7
Wisconsin .....	32	26	59.4	61.5
Other States <sup>1</sup> .....	34	35	55.9	51.4
United States .....	904	881	74.0	69.5

(D) Withheld to avoid disclosing data for individual operations.

<sup>1</sup> Includes data for States not published in this table.

**Quality Metrics for Total Inventory, Layers, and Pullets - States and United States:  
December 1, 2019-2020**

State	Total Inventory		Total Layers		Total Pullets	
	Weighted item response rate		Weighted item response rate		Weighted item response rate	
	2019	2020	2019	2020	2019	2020
	(percent)	(percent)	(percent)	(percent)	(percent)	(percent)
Alabama .....	86.1	65.1	85.0	62.5	87.1	69.5
Arkansas .....	95.4	89.8	94.9	88.3	96.2	91.6
California .....	80.7	85.1	80.2	82.6	83.9	96.0
Colorado .....	83.5	92.2	85.4	94.5	76.8	85.0
Georgia .....	75.5	74.3	77.9	78.2	70.8	66.2
Illinois .....	97.2	85.2	98.7	85.2	73.6	84.6
Indiana .....	82.1	52.8	80.9	51.9	86.6	56.0
Iowa .....	98.4	90.5	98.3	89.4	99.1	95.0
Kentucky .....	87.5	91.1	89.1	93.8	85.2	85.7
Louisiana .....	68.6	100.0	70.7	100.0	61.4	100.0
Maryland .....	6.4	7.3	5.6	6.9	7.5	7.5
Massachusetts .....	(D)	(D)	(D)	(D)	(D)	(D)
Michigan .....	60.5	59.5	60.7	59.5	59.5	59.7
Minnesota .....	91.7	69.8	90.2	66.7	99.2	81.6
Mississippi .....	76.8	87.7	78.0	87.0	75.8	87.5
Missouri .....	98.3	87.3	97.8	88.0	99.3	85.3
Montana .....	90.1	96.1	91.3	96.7	86.7	94.5
Nebraska .....	97.5	97.3	97.0	97.7	100.0	95.9
New York .....	87.0	55.6	87.3	55.1	86.4	57.3
North Carolina .....	96.9	93.3	97.4	94.9	96.3	89.9
Ohio .....	90.3	75.6	90.0	72.6	92.2	88.2
Oklahoma .....	87.6	86.8	87.6	86.3	86.3	85.4
Oregon .....	100.0	98.3	100.0	97.9	100.0	100.0
Pennsylvania .....	76.8	78.3	77.1	77.0	75.3	85.6
South Carolina .....	34.1	89.7	34.8	90.9	31.0	85.7
South Dakota .....	94.5	96.4	93.1	95.6	100.0	100.0
Tennessee .....	68.4	86.1	60.3	88.3	78.2	83.7
Texas .....	87.4	94.8	89.4	94.3	83.2	96.5
Utah .....	76.3	87.8	72.7	87.5	88.7	89.1
Vermont .....	(D)	(D)	(D)	(D)	(D)	(D)
Virginia .....	98.1	99.5	97.4	99.3	100.0	100.0
Washington .....	94.1	94.0	94.2	94.0	93.4	93.8
West Virginia .....	99.5	99.5	100.0	100.0	98.6	98.7
Wisconsin .....	91.6	95.5	91.9	94.9	90.1	97.7
Other States <sup>1</sup> .....	65.5	50.3	65.5	51.0	65.8	46.9
United States .....	85.0	78.6	85.1	77.8	84.9	80.7

(D) Withheld to avoid disclosing data for individual operations.

<sup>1</sup> Includes data for States not published in this table

## Information Contacts

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Questionnaires .....	Data Collection Branch	(202) 720-6201	HQ_CSD_DCB@usda.gov
Sampling and Editing .....	Sampling Editing and Imputation Methodology Branch	(202) 690-8141	HQ_CSD_SB@usda.gov
Summary and Estimators .....	Summary Estimation and Disclosure Methodology Branch	(202) 690-8141	HQ_SD_SMB@usda.gov
Dissemination .....	Data Dissemination Office	(202) 720-3869	HQSDOD@usda.gov
Media Contact and Webmaster ....	Public Affairs Office	(202) 720-2639	HQOAPAO@usda.gov

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