



# Honey Methodology and Quality Measures

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## Annual Bee and Honey Inquiry Methodology

**Scope and Purpose:** The Bee and Honey Inquiry is conducted annually in all States. The population consists of all known producers with five or more colonies. Data are collected on the following: current year honey production, total colonies, colonies harvested, current year quantity, and value of sales for honey produced in the current year and in the previous year, and honey stocks as of December 15. Stocks exclude those held under the commodity loan program.

Data are summarized for all operations reporting five or more colonies harvested. If honey stocks or colonies were present in more than one state, each state is counted. Estimates are published for honey producing colonies, yield per colony, production, stocks on December 15, average price per pound, and value of production at a National and a State level. The publication contains combined estimates for ten States with low levels of production labeled as “Other States”. Estimates for honey prices by color class and marketing channel are also included in the publication.

**Survey Timeline:** For the Bee and Honey Inquiry data collection begins in December using the current year as the reference period. Honey Stocks are recorded for a December 15 reference date. Questionnaires are mailed in early December. Telephone follow-up is conducted for nonresponse records beginning in late January. Enumerators at NASS’s National Operations Center (NOC) collect data for a period of approximately one month. Assigned Regional Field Offices have approximately two weeks from the end of data collection in February to complete editing and analysis, execute the summary, interpret the survey results, and submit recommendations for estimates. Over the next three weeks a National review is completed and National estimates are established. Estimates are released to the public in March as specified by the Agricultural Statistics Board on its annual publications calendar.

**Sampling:** The target population for the Bee and Honey Inquiry is all agricultural operations with five or more total colonies of bees. A profile of each operation is maintained on the NASS List Sampling Frame (hereafter List Frame) to allow NASS to identify operations eligible for sampling. For bee and honey operations the List Frame is a current and unduplicated list of agricultural operations, and all current bee and honey operations are assumed to be on the list. Survey population definition and sampling are completed annually. Each bee and honey operations is classified into one of several mutually exclusive strata based on honey production, presence of operation in multiple States, and percent of State total colonies.

If an unlisted apiary is identified at any time, the operation is added to the List Frame. The survey sample is drawn annually; hence, apiaries discovered after the sample has been drawn may be ineligible to be part of the survey sample until the following year.

**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, show the design applies sound statistical practice, and ensure the data do not already exist elsewhere and that the public is not excessively burdened. The Bee and Honey Inquiry 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 States use the same, standardized questionnaire for data collection. For consistency across modes, the paper version is considered the master questionnaire and the web 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, which can be used to complete the survey securely online. Regional Field Offices are responsible for their data collection strategy, and must include provisions for respondents to report securely online. If response is not received by mail or online, respondents are contacted by computer-assisted telephone interviews (CATI). Limited personal interviewing is 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. The edit logic ensures administrative coding follows the methodological rules associated with the survey design. Relationships between data items on the current survey are verified. Some data items in the current survey are compared to data items from earlier surveys to ensure certain relationships are logical. Records that fail edit requirements must be updated or certified by an analyst to be exempt from the failed edit requirement. Only records that pass edit requirements are eligible for final summary.

During the data edit operations reporting colonies in more than one state must have a special review completed. A reconciliation review is completed between the sending and receiving States. All States involved must agree upon the allocation of honey amongst states. This reconciliation procedure eliminates duplication and ensures that the honey is recorded in the state in which the honey was harvested or stocks were stored.

**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 Regional Field Office 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.

**Nonresponse Adjustment:** Response to the Bee and Honey Inquiry is voluntary. Some producers refuse to participate in the survey. Others cannot be located during the data collection period and some submit incomplete reports. The nonrespondents are accounted for in the estimation process.

**Estimators:** Each bee and honey operation in the sample has an initial sampling weight, which is the inverse of the sampling fraction for the stratum to which the bee and honey operation is assigned. For the Bee and Honey Inquiry, nonrespondents are accounted for in one of two ways. For bee and honey operations in strata made up of large and, often unique, operations production, colonies, stocks, and production sold must be manually imputed. Nonrespondents in all other strata are accounted for by adjusting the weights of the usable responses to account for responses that are not usable. The adjustment occurs at the stratum level for all strata that represent bounded homogenous groupings of similar sized operations. The adjustment is performed by individual items on the questionnaire (number of colonies, honey sales) so adjustments for item nonresponse (partial reports) and unit nonresponse (refusals and inaccessible) can be done in a single calculation.

Point estimates, called direct expansions, are calculated by multiplying the reported value by the combined nonresponse weight and sampling weight and summing to a stratum total. A variance estimate is also computed at the stratum level. Totals and variances are additive across strata to form a State estimate and State estimates are additive to a National estimate.

Ratio estimates are also computed for many items including prices. Ratio indications use the reweighted estimator described above for the numerator and denominator direct expansions. Both the numerator and denominator must be usable in order for that record to be used in the ratio indication.

**Estimation:** When all samples are accounted, all responses fully edited and the analysis material is reviewed, each assigned Regional Field Office executes a summary to evaluate and analyze the data under its responsibility. When all assigned Regional Field Offices have run summaries, headquarters receives all State files and pools the data. 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 their standard errors. It also provides information to assess the performance of the current survey and evaluate the quality of survey indications, such as response rates and strata level expansions. Regional Field Offices 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 Regional Field Offices interpret the survey results and submit a recommended estimate to Headquarters for honey production, honey producing colonies, yield, and stocks. Price and value of production estimates are set at the state level with United States estimates summed from each State. NASS assembles a panel of statisticians to serve as the Agricultural Statistics Board (ASB), which reviews the National results and establishes the National estimates. The survey indications used in State summaries are produced by the National summary. ASB follows the same approach the assigned Regional Field Offices 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. Price revisions can result from additional sales reported the following year. 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 five-year Census of Agriculture are available. The information gathered from the Census of Agriculture is used to establish "bench mark" levels by which the survey estimators can be compared and bias determined.

## Quality Metrics for Honey

**Purpose and Definitions:** Under the guidance of the Statistical Policy Office of the Office of Management and Budget (OMB), the United States Department of Agriculture's National Agricultural Statistics Service (NASS) provides data users with quality metrics for its published data series. The metrics table below describe the performance data for all surveys contributing to the publication. The accuracy of data products may be evaluated through sampling and non-sampling error. The measurement of error due to sampling in the current period is irrelevant for a fully enumerated data series. Non-sampling error is evaluated by response rates and the percent of the estimate from reported data.

**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 sample that completed the survey. This calculation follows Guideline 3.2.2 of the Office of Management and Budget Standards and Guidelines for Statistical Surveys (Sept. 2006).

**Bee and Honey Inquiry Sample Size and Response Rates:** To assist in evaluating the performance of the estimates in the honey report, the sample size and response rates are displayed. Response rates overall for 2012 and 2013 are displayed.

## Honey Survey Sample Size and Response Rates – United States: 2012-2013

	2012		2013	
	Sample size (number)	Response rate (percent)	Sample size (number)	Response rate (percent)
Alabama .....	169	78.1	153	82.4
Arizona .....	38	71.1	39	76.9
Arkansas .....	97	73.2	85	70.6
California .....	388	69.3	410	78.5
Colorado .....	77	77.9	85	72.9
Florida .....	588	66.5	480	71.7
Georgia .....	149	80.5	166	79.5
Hawaii .....	37	75.7	44	68.2
Idaho .....	57	80.7	58	81.0
Illinois .....	174	74.1	207	80.7
Indiana .....	140	75.0	139	75.5
Iowa .....	160	77.5	150	80.0
Kansas .....	64	78.1	60	78.3
Kentucky .....	188	73.4	201	76.6
Louisiana .....	69	59.4	78	79.5
Maine .....	33	78.8	35	74.3
Michigan .....	235	75.3	257	77.4
Minnesota .....	191	79.6	186	73.1
Mississippi .....	71	56.3	74	75.7
Missouri .....	107	71.0	101	73.3
Montana .....	84	78.6	82	79.3
Nebraska .....	65	87.7	73	86.3
New Jersey .....	86	74.4	83	75.9
New Mexico .....	21	66.7	31	71.0
New York .....	195	75.4	200	79.0
North Carolina .....	348	79.0	337	77.2
North Dakota .....	128	68.8	118	75.4
Ohio .....	483	68.7	478	67.4
Oregon .....	115	81.7	119	85.7
Pennsylvania .....	414	79.0	394	80.5
South Dakota .....	103	71.8	100	83.0
Tennessee .....	280	79.6	261	83.9
Texas .....	161	71.4	159	81.8
Utah .....	52	63.5	59	83.1
Vermont .....	33	84.8	38	63.2
Virginia .....	150	68.0	185	77.3
Washington .....	170	70.6	197	73.6
West Virginia .....	222	81.1	213	76.5
Wisconsin .....	205	81.0	212	74.5
Wyoming .....	35	85.7	33	90.9
Other States .....	497	73.8	478	78.7
United States .....	6,879	74.2	6,858	77.0

## Information Contacts

Process	Unit	Telephone	Email
Estimation .....	Livestock Branch	(202) 720-3570	HQ_SD_LB@nass.usda.gov
Data Collection .....	Survey Administration Branch	(202) 720-3895	HQ_CSD_SAB@nass.usda.gov
Questionnaires .....	Data Collection Branch	(202) 720-6201	HQ_CSD_DCB@nass.usda.gov
Sampling and Editing .....	Sampling Editing and Imputation Methodology Branch	(202) 720-5805	HQ_CSD_SB@nass.usda.gov
Summary and Estimators .....	Summary Estimation and Disclosure Methodology Branch	(202) 720-4008	HQ_SD_SMB@nass.usda.gov
Dissemination .....	Data Dissemination Office	(202) 720-3869	HQSDOD@nass.usda.gov
Media Contact and Webmaster .	Public Affairs Office	(202) 720-2639	HQOAPAO@nass.usda.gov

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