UNITED STATES CENSUS OF
AGRICULTURE
1945

DEPARTMENT OF COMMERCE

W. Averell Harriman, *Secretary*

BUREAU OF THE CENSUS

J. C. Capt, *Director*

Special Report
1945 Sample Census of Agriculture

DEPARTMENT OF COMMERCE
W. AVERELL HARRIMAN, *Secretary*

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J. C. CAPT, *Director*

UNITED STATES CENSUS OF AGRICULTURE: 1945

SPECIAL REPORT
ON THE 1945 SAMPLE CENSUS OF AGRICULTURE

Horses, Mules, and Cattle by Age Groups, Specified Expenditures,
Tractors by Kind and Year of Model, Electric Motors,
Gasoline Engines, Combines, Milking Machines, Farm
Population by Age and Sex, and Statistics
By Economic Class of Farm

Prepared under the supervision of
RAY HURLEY
CHIEF, Agriculture Division
Bureau of the Census

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UNITED STATES CENSUS OF AGRICULTURE: 1945

REPORTS ON AGRICULTURE

Volume I.—Statistics for farms, acreage, value, characteristics, livestock, livestock products, crops, fruits, and value of farm products. This volume consists of 33 parts, comprised of State reports with statistics for counties.

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   New Hampshire
   Vermont
   Massachusetts
   Rhode Island
   Connecticut
2. Middle Atlantic States:
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3. Ohio
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Volume II.—General Report—Statistics by subjects for the United States, geographic divisions, and States (one volume).

Chapter
I. Farms and Farm Property
II. Size of Farm
III. Color and Tenure of Farm Operator
IV. Age, Residence, Years on Farm, and Work off Farm
V. Farm Population and Farm Labor
VI. Farm Facilities, Roads, and Farm Machinery
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VIII. Field Crops and Vegetables
IX. Fruits and Nuts, and Horticultural Specialties
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SPECIAL REPORTS

Multiple-unit Operations—Units, subunits, acreage, value, characteristics, specified crops and livestock and value of products.

Ranking Agricultural Counties—The rank of the leading counties in the United States in agriculture and agricultural products, 1945 and 1944, with comparisons, 1940 and 1939.

Special Report on the 1945 Sample Census of Agriculture—Statistics by States for items for which data were collected on a sample basis and data for farms classified by economic class.

LETTER OF TRANSMITTAL

DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
Washington, D. C.
June 16, 1947

SIR:

I transmit herewith a special report on the 1945 Sample Census of Agriculture. This report presents statistics collected from a sample of all farms in the 1945 Census of Agriculture. It includes data by States on horses, mules, cattle, and sheep by age groups; specified expenditures; tractors on farms by kind and year of model; automobiles and motortrucks on farms by year of model; electric motors; stationary gasoline engines; combines; milking machines; facilities in farm dwellings; and farm population by sex and age. It presents also data for selected items for specified large farms and for farms classified by economic class; for cows milked, and milk production classified by the number of cows milked; and for the number of chickens, egg production, and chickens raised by size of flock.

The 1945 Census of Agriculture was taken in conformity with the Act of Congress providing for the Fifteenth Decennial Census and subsequent censuses, approved June 18, 1929. The collection of the data was performed by enumerators under the direction of supervisors appointed by the Director of the Census. The compilation of the statistics in this volume was made under the supervision of Ray Hurley, Chief, Agriculture Division, and Warder B. Jenkins, Assistant Chief, with the assistance of Hilton E. Robison, John A. Burroughs, Carl R. Nyman, Raymond S. Washburn, Harold Nisselson, Lois Hutchison, Orville M. Slye, Gladys L. Eagle, and Henry A. Tucker. The mechanical tabulation, by electrical machines, was made under the supervision of C. F. Van Aken.

Acknowledgment is made of the technical assistance and of the loan of technical personnel by the United States Department of Agriculture in the planning, the enumeration, and the compilation of the 1945 Census of Agriculture.

Respectfully,

J. C. CAPT,
Director of the Census.

Hon. W. AVERELL HARRIMAN,
Secretary of Commerce.

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INTRODUCTION

Requests for special inquiries to be included on the questionnaire of the 1945 Census of Agriculture far exceeded the number that could be accommodated within the administrative limitations of time and funds available.

A major contribution toward meeting this demand for more information was the technique of using a basic schedule for all farms and then asking certain additional questions for a designated sample of farms. The supplementary items for which information was obtained on a sample basis consisted of 55 numbered questions dealing with the farm and farm operations and 19 numbered questions for each person residing on the farm. The request for these items had indicated that, in general, data were needed only for large areas such as regions or States. This report presents the available data for all the supplementary items for which the information was obtained on a sample basis. It presents also statistics for the farms included in the sample for items included in the complete Census cross-classified according to various characteristics as chickens, chicken eggs produced, and chickens raised by number of chickens on hand.

Description of sample.—In the sampling plan a cross section of small areas throughout the country was selected in such manner that the farms in those sample areas might represent all farms in the United States, as well as all farms in each State, for the items to be included in the enumeration. For this purpose, every county in the United States was completely subdivided into small areas or segments which averaged about 5 farms each and 2.5 square miles in area. A sample of one out of every 18 of these segments or sample areas was drawn. Every county in the United States was represented in the sample, with the exception of a few counties containing only a very small number of farms. Provision was made to insure the proper representation of farms in incorporated places and thickly settled unincorporated areas, as well as in open country areas. A detailed statement of the specific methods used in selecting this sample and for evaluating the precision of results may be obtained by writing to the Bureau of the Census. The sample was developed jointly by the Bureau of the Census and the Bureau of Agricultural Economics, with the cooperation of the Statistical Laboratory of Iowa State College, for use in connection with the 1945 Census of Agriculture, and for general use in sample surveys in the field of agriculture. All farms having their headquarters (farm dwellings, farm buildings, or farm entrance) within the selected areas were designated as sample farms, and were enumerated in schedule books containing the supplementary questions in addition to the questions asked of other farms.

In addition, the sample plan provided for obtaining information for the supplemental inquiries for approximately 50,000 of the largest farms in the United States, regardless of whether or not these were located in sample segments. For many items these large farms, although few in number, accounted for a considerable part of the State and national totals, and efficient sampling called for their inclusion in the sample. The criteria for selection of these large farms varied from State to State but were such as to insure the inclusion of most of those farming operations making large individual contributions to the total agriculture of the State. Lists of these specified large farms, prepared by the district supervisors, were provided the enumerator in advance of his canvass.

The supplemental enumeration, by including all the larger farms in addition to one in 18 of the remaining farms, covered about 1/14 of the farms in the United States and a much larger proportion of the acreage and production. This size of sample, except for a few of the smaller States and some of the more detailed tabulations, provided an adequate basis for State and national estimates for the supplementary items. In addition, it made feasible the tabulation, by various classifications, of items on the basic schedule which, if made for all farms, would have been prohibitive in cost. For example, tabulations for such items as the production of eggs for farms classified by size of flock would not be feasible for all farms, but could be obtained very satisfactorily on the basis of tabulations for farms in the sample only.

Sampling reliability of estimates.—When data are tabulated for a sample, exact agreement with the results that would have been obtained from a tabulation for all farms is not expected. Similarly, when items are tabulated both for all farms and sample farms, the resulting final figures are not expected to coincide exactly. The differences in such cases are partly the result of sampling variation or errors, although some are due to differences between the enumeration and processing of sample farms and other farms. Measures of sampling reliability necessary for evaluating the data are provided in this report for items collected only for the farms included in the sample, and also for items for which data were collected for all farms but for which the tabulations were limited to data for farms in the sample.

Wherever convenient, an indication of the sampling error is presented by a footnote on the table in which the data appear. In such cases only figures subject to a coefficient of variation of 5 percent or more have been footnoted. Figures marked with a dagger (†) are subject to coefficients of variation between 5 percent and 15 percent; and figures marked with an asterisk (*) are subject to coefficients of variation greater than 15 percent. All figures which are not marked with a dagger or an asterisk in a column to which these designations apply have a coefficient of variation of less than 5 percent. The coefficient of variation is a predicted limit of *relative* error such that the chances are about 19 in 20 that the difference between the sample estimate and the figure that would have been obtained from a complete enumeration or for a tabulation of the items for all farms would be less than twice the limit specified. For example, if a sample percentage is 2.0 percent with a coefficient of variation of 25 percent, the chances are about 19 in 20 that the sample would not differ by more than 1.0 percent (2 x 25% = 50% of the sample estimate of 2.0%) from the precentage that would have been obtained from a complete enumeration of all farms. The chances are about one in 20 that the difference would be greater than twice the coefficient of variation. A majority of the estimates would be expected to show a difference less than that indicated by the coefficient of variation, however.

The sampling reliability of the estimated number of farms reporting a given item, or in a given class, is shown in the table on page 7. These measures apply to all tables and items for which data are presented for farms reporting. Separate tables are also provided for estimates of farm population; estimates of acreage and production of Irish potatoes for farms classified by acreage in potatoes; estimates of dairy items for farms classified by number of cows milked; estimates of poultry items for farms classified by number of chickens on hand, and for farms classified by economic class.

In general the measures of sampling reliability presented tend to over-estimate the variation in the sample estimates. This is true for several reasons: (1) The estimated coefficients of variation and differences presented ignore the complete enumeration of large

farms. (2) The sampling errors used in setting the coefficients of variation tended to be over-estimates.

The data on sampling reliability may overstate considerably the sampling variation in those cases when large farms account for a substantial proportion of the item total in the State. For example, in Arizona and Nevada about 80 percent of all sheep reported were on large farms. Consequently the estimated percent of ewes 1 year old and over in each of those two States is designated in the table only as being subject to a coefficient of variation of less than 15 percent although it actually has a coefficient of variation of less than 5 percent.

In any particular case, the sampling errors or differences given herein may be adjusted for large farms by multiplying by the factor (1-p), where p is the proportion of the item total reported on large farms. Where subclasses of an item are given the factor (1–p) should be taken for the total and not for the subclass. Alternatively, when the number of farms necessary to achieve a given level of reliability is specified, adjustment may be made by multiplying the stated number of farms by the factor (1–p).[2]

Variation from sources other than sampling.—In preparing estimates of totals from the sample, adjustment was made for farms not reporting; as, for example, farms reporting tractors but not their type. This leads to an unknown bias in the estimates to the extent that the farms not reporting differ in respect to the item from farms that did report. If the amount of underreporting was considered important it is discussed in the text for each item. Moreover, there are other difficulties in reporting that affect both the sample and the complete census. These are also discussed under each item.

The measures of sampling reliability presented do not include provision for reporting errors or biases in response.

Method of estimation.—The method of preparing estimates of numbers of farms and item totals from the sample was to multiply the tabulated totals for other than specified large farms by 18 and then to add the corresponding totals tabulated for all large farms.

Area covered.—This report presents data only for States or groups of States. It does not contain data for the District of Columbia and hence United States totals for 1945 and for 1940 exclude data for the District of Columbia.

TABLE a.—SAMPLING RELIABILITY OF THE ESTIMATED NUMBER OF FARMS REPORTING ANY ITEM:[1] 1945 CENSUS OF AGRICULTURE

If the estimated number of farms reporting is—	Then the chances are about 19 in 20 that the estimated number would differ from the results of a complete enumeration or tabulation by less than [2]—	
	Absolute difference	Percentage difference
50	80	160
250	180	72
500	255	51
1,000	360	36
2,500	570	23
5,000	800	16
7,500	1,000	13
10,000	1,100	11
15,000	1,400	9.3
25,000	1,800	7.2
50,000	2,600	5.2
100,000	3,600	3.6
250,000	5,700	2.3
500,000	8,000	1.6
1,000,000	11,000	1.1
2,000,000	16,000	0.80
5,000,000	26,000	0.52

[1] For estimated number of resident operators reporting kitchen sink with drain, mechanical refrigeration, and power-driven washing machine in the following States, the differences given should be multiplied by 7/4:

California
Indiana
Iowa
Kansas
North Carolina
Ohio
Pennsylvania

[2] For items or classes in which the estimated number of farms reporting constitutes more than 50 percent of all farms, a more precise limit may be obtained by multiplying the difference given in the table by an appropriate factor as follows:

When farms reporting constitute (percent)—	*Multiply given limit by—*
50	0.75
75	.50
90	.30
95	.20

Only those items for which the table description is considered inadequate or which are not covered by explanations given elsewhere are considered. The definitions consist primarily of a resumé of schedule wording, occasionally supplemented by the more essential parts of instructions given to enumerators.

Farm.—The schedule book for 1945 was entitled "Farm and Ranch Schedule." The following definition appeared in each schedule book:

A farm, for Census purposes, is all the land on which some agricultural operations are performed by one person, either by his own labor alone or with the assistance of members of his household, or hired employees. The land operated by a partnership is likewise considered a farm. A "farm" may consist of a single tract of land, or a number of separate tracts, and the several tracts may be held under different tenures, as when one tract is owned by the farmer and another tract is rented by him. When a landowner has one or more tenants, renters, croppers, or managers, the land operated by each is considered a farm. Thus, on a plantation the land operated by each cropper, renter, or tenant should be reported as a separate farm, and the land operated by the owner or manager by means of wage hands should likewise be reported as a separate farm.

Include dry-lot or barn dairies, nurseries, greenhouses, hatcheries, fur farms, mushroom cellars, apiaries, cranberry bogs, etc.

Do not include "fish farms," "fish hatcheries," "oyster farms," and "frog farms." Do not report as a farm any tract of land of less than 3 acres, unless its agricultural products in 1944 were valued at $250 or more.

Farming, or agricultural operations, consists of the production of crops or plants, vines, and trees (excluding forestry operations) or of the keeping, grazing, or feeding of livestock for animal products (including serums), animal increase, or value increase. Livestock, as here used, includes poultry of all kinds, rabbits, bees, and fur-bearing animals in captivity, in addition to mules, asses, burros, horses, cattle, sheep, goats, and hogs. Frequently, certain operations are not generally recognized as farming. This is especially true where no crops are grown or where the establishments are not commonly considered as farms.

There was provided a partial list of types of specialized agriculture and of operations not generally recognized as farming but for which a report was required. This list included such operations as apiaries (bee farms), feed lots, greenhouses, hatcheries, mushroom cellars, etc.

The definition of a farm used in the 1945 Census of Agriculture was essentially the same as that used in the 1940, 1935, 1930, and 1925 Censuses. Those used for the 1920 and 1910 Censuses were similarly worded but were somewhat more inclusive. In those years farms of less than 3 acres with products valued at less than $250 were to be included, provided they required the continuous services of at least one person. Because of the difference in price level, the $250 limit for the minimum value of products for farms of under 3 acres resulted in the inclusion in 1945 of more farms at or near the lower limits of value or acreage than were included in the earlier censuses. Comparability, particularly on a county level, in the number of farms for the different censuses is affected by such marginal farms.

Farm operator.—A "farm operator," according to the Census definition, is a person who operates a farm, either performing the labor himself or directly supervising it. The number of farm operators is identical with the number of farms.

Color.—Farm operators and persons living on farms are classified as "white" and "nonwhite." White includes Mexicans and "nonwhite" (designated as "other" on the schedule) includes Negroes, Indians, Chinese, Japanese, and all other nonwhite races.

Tenure of operator.—Farm operators are also classified according to the tenure under which they operate their farms.

Full owners own all the land they operate.

Part owners own a part and rent from others the remaining part of the land they operate.

Managers operate farms for others and are paid wages or salaries for their services. Persons acting merely as caretakers or hired as laborers are not classified as managers.

Tenants operate hired or rented land only. *Cash* tenants pay a cash rental, such as $4.50 per acre for the cropland or $500 for the use of the whole farm. *Share-cash* tenants pay a part of their rental in cash and part as a share of crop or livestock production. *Share* tenants pay a share only of either the crop or livestock production or both. *Croppers* have been defined as share tenants to whom their landlords furnish all the work animals or tractor power in lieu of work animals. In some of the cropper areas, tenants pay cash rent for noncash crops and a share of the crop for the cash crop. These tenants, as well as those for whom the method of rental was not reported, were classified as croppers, if the work power was furnished by the landlord. *Other and unspecified* tenants include those whose rental agreement was unspecified and those who could not be included in one of the other subclasses.

Farms reporting.—The term "farms reporting," as used in the tables, indicates the number of farms for which the specified items shown in the particular table were reported.

Land in farms.—The acreage designated as "all land in farms" includes considerable areas of land not actually under cultivation and some land not even used for pasture or grazing, but all such land must have been under the control of the operator and considered a part of his farm. However, large areas of timberland or other nonagricultural land held by an operator of a farm as a separate business, and not used for pasture or grazing, or for any other farm purpose, were to be excluded. Land neither owned nor leased but from which crops, including wild hay, were harvested was to be reported as part of the farm. When cattle, sheep, or other livestock were grazed or pastured on land neither owned nor leased by the operator, such land was not to be included as a part of the farm. Operations limited to livestock grazing on open range and reported as having no land owned or leased were given "0" acres and were included with farms of under 3 acres. In most of the States the increases in land in farms represent land used for grazing. In the Western States this increase does not necessarily represent more land used for agricultural purposes. It is more likely that a large part of it represents leased land which was formerly open range.

The 1945 Census also includes in farm acreage more Indian grazing lands than prior censuses because of changes in the method of enumerating agricultural activities on Indian reservations. In 1945, if land in an Indian reservation was used by the Indians on a cooperative basis, the entire acreage in the reservation was reported as a single farm. In such cases, much grazing land, not included in farms in previous censuses, was included as land in farms in 1945.

In 1945, data were obtained for eight classes of land based upon the use made of the land in 1944. Data are presented in this report for only one of these eight classes of land, namely, cropland harvested.

Cropland harvested.—The land from which cultivated crops were harvested; land from which hay (including wild hay) was cut; and land in small fruits, orchards, vineyards, nurseries, and greenhouses. When two or more crops were harvested in 1944 from the same acreage, such acreage was included only once in the acreage for cropland harvested. However, the acreage and the quantity of each individual crop were reported separately as crops harvested. Thus, in some counties the total of the acreage of crops may greatly exceed the acreage designated as cropland harvested.

Farm values.—The enumerators were instructed to obtain from each farm operator the total value of the farm (land and buildings) owned by the operator and, also, the value of that part of the farm rented from others. The value to be reported was the market value. For part-owner operators, the value of the owned and rented portions, as well as the total value, of the farm is shown in county table V.

Finally, the operator was asked to place an over-all value on the farm implements and machinery used in operating the farm. This was to represent the present market value and was to include not only the farm implements but also the tools, tractors, motortrucks,

wagons, harnesses, dairy equipment, gins, threshing machines, combines, and all other farm machinery. However, the values of automobiles, commercial mills and factories, and, also, permanently installed irrigation and drainage equipment were to be omitted. In previous censuses, the value of automobiles was to be included in the value of implements and machinery. In making comparisons with the figures for 1940 and earlier censuses, it should be noted that the value of all automobiles on farms is not included in the 1945 figures.

The difference in the number of farms reporting value of implements and machinery and the total number of farms indicates that this item may be incompletely reported, as it is not likely that the number of farms not having implements and machinery is as great as this difference indicates.

Facilities.—The number of farms having various facilities was obtained by the inquiry "Does farm dwelling have—Running water? Electricity? Radio? Telephone?" The number of farms with dwellings, either occupied or unoccupied, with reports of "yes" to these inquiries is shown by States. In using these figures, it should be kept in mind that they represent a minimum number of farms having these facilities as reports for these items were occasionally omitted.

Value of farm products sold or used by farm households.—The enumerated values are presented in this bulletin as "Value of farm products sold or used by farm households." These values were obtained by the enumerators from farm operators. The 1945 Farm and Ranch Schedule contained nine questions relating to the value of farm products sold, traded, or used by farm households. The total value of farm products sold or used by farm households is a total of the individual reports of farm operators for the nine value-of-products questions on the schedule. The total value of farm products, or the value of farm products sold plus the value of farm products used by farm households, gives an approximate measure of gross farm income. The value-of-products questions were uniform for all States. It will be noted that the arrangement of these nine questions was such that each question appeared immediately following the reports on the items to which the value questions related—i.e., the inquiry on the value of the field crops followed immediately after the inquiries on the acreage and production of field crops.

The value questions relating to livestock and livestock products, horticultural products, and forest products apply to the calendar year 1944; whereas, the value questions for fruit and nut crops, vegetables harvested for sale, all other crops (field crops), and farm products used by farm household are for the crop year immediately preceding the census.

Since the individual farm is the unit of enumeration, the value-of-products figures necessarily include duplications because of the interfarm sales. For example, feed crops produced on Farm A may be sold to Farm B; in this case, their value will be reflected in the gross livestock income for Farm B. Similarly, a Texas ranch may show sales of feeder cattle, and the same cattle may be fattened and sold from an Illinois farm.

The value-of-products figures do not include income from nonagricultural sources, such as work off the farm by the farm operator or members of his family.

Enumerators were instructed not to include in the value of farm products sold any government payments, such as soil conservation and dairy feed or dairy production payments.

Fruits and nuts sold.—In general, the figures reported for this question cover the value of all fruits and nuts harvested in 1944 that had been or were to be sold at the time of the census enumeration. However, the information on citrus fruit applies to the 1943-1944 season, that is, to the crop harvested from the bloom of 1943. The value figures on fruit cover all tree fruits, nuts, and grapes, as well as small fruits. Sales of wild fruits and nuts are excluded with two exceptions: wild blueberries were to be reported on the census schedule where the land was used primarily for their production; and wild or seedling pecans were also reported whether grown in orchards, farmyards, pastures, or elsewhere on the farm or ranch. The enumerator was instructed that, for all the value-of-products questions, gross receipts or values were desired without deductions for expenses of any kind. However, in the case of fruit, there was a noticeable tendency in many commercial fruit areas for growers to report their net receipts instead of the gross value of all fruit sold or traded. This was particularly true in sections where certain marketing costs were commonly deducted from the payments to the grower for fruit sold. Another factor which may have contributed to the tendency to report net receipts for fruit crops was the absence of any questions on the schedule regarding expenditures for such items as spray materials, orchard cultivation, irrigation water, packages, and other production and marketing costs.

Vegetables sold.—The values reported for this item represent the total value of vegetable crops harvested in 1944 for sale. Irish potatoes and sweetpotatoes were not included under vegetables but were included under field crops.

Horticultural specialties sold.—The values reported for this item include the value of sales for crops grown under glass and propagated mushrooms; nursery products; and flower and vegetable seeds, bulbs, and flowers and plants grown in the open.

All other crops (field crops) sold.—This question covers the value of the sales of field crops such as corn, sorghums, small grains, annual legumes, hay, clover and grass seeds, and miscellaneous crops, including Irish potatoes and sweetpotatoes, cotton (lint), tobacco, sugarcane, sugar beets, hops, etc. In addition, the enumerator was instructed to include the value of sales of byproducts such as cottonseed, beet pulp and tops, pea vines, etc., although no provision was made for reporting the production of such byproducts on the schedule. On some schedules the value of sales of cottonseed apparently was not included in the value of field crops sold or traded. The enumerator was also instructed that where the farm operator was a tenant, the landlord's share should be included in reporting the value of sales, not only for this item, but also for all other value-of-products questions. Income from grazing livestock on a per-head basis was also included under this question.

Dairy products sold.—This question called for the value of all dairy products sold or traded in 1944, including sales of cheese, buttermilk, and skimmed milk, as well as sales of milk, butterfat, and butter. The value of dairy products purchased for resale was to be excluded, both from this value question and from the preceding items on quantities of whole milk, cream, and butter sold.

Poultry and poultry products sold.—Sales of ducks, geese, guineas, pigeons, baby chicks, and poults were included, as well as sales of eggs, broilers, fryers, other chickens, and turkeys.

Livestock and livestock products sold (other than dairy and poultry).—This value question included the sale of horses, mules, cattle and calves, hogs and pigs, sheep and lambs, meat (except poultry), goats, goat milk, wool, mohair, fur animals in captivity and pelts, bees, and honey.

Forest products sold.—The values reported for this question include sales of firewood, fuel wood, standing timber, sawlogs, veneer logs, pulpwood, mine props, bark, charcoal, fence posts, railroad ties, poles and piling, turpentine, resin, maple sirup and sugar, etc.

Farm products used by farm households.—This question called for the value of products of the farm in 1944 that were, or were to be used by all households on the farm. The following items were to be included in this question if consumed on the farm where produced: meat, milk, cream, butter, poultry, eggs, honey, vegetables, fruit, firewood, fuel wood, and Irish and sweet potatoes. Farm products of institutional farms which were used by inmates of the institution

were considered as sold, and the value was included under the other eight value-of-products questions. The same procedure was followed with respect to products of Community Victory gardens.

Specified large farms.—In planning the 1945 Census of Agriculture, provision was made for the inclusion in the sample of all farms designated as being "large." Criteria consisting of five items were established for large farms for each State and Census enumerators were instructed to include in the census, as a large farm, any farm that met any of these five criteria. The five criteria are given in table b. In addition, enumerators were permitted to include a limited number of other farms which were outstandingly large for the area.

In 15 States (Alabama, Georgia, Kentucky, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, Virginia, Florida, Arkansas, Louisiana, New Mexico, Oklahoma, and Texas), the criteria were to be applied to the totals for the multiple unit or plantation (see Special Report on multiple-unit operations for definition of multiple units, home farms, etc.) when the farm comprised part of a multiple unit. In case the multiple unit qualified as a large farm, all farms comprising the multiple unit were considered large farms. Many of the home farms and most of the subunits of multiple units considered as large farms would not individually qualify as large farms. In the compilation of the data, each farm comprising a part of a multiple unit qualifying as a large farm was included in the tabulation as a "large" farm for 8 of the 15 States, viz, Kentucky, Missouri, Tennessee, Virginia, Florida, New Mexico, Oklahoma, and Texas. In the other 7 States, viz, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Arkansas, and Louisiana, only the "home" farms of multiple units qualifying as large farms were included. In such cases, the "home" farms were included whether or not they themselves met the criteria for large farms. As the result of the inclusion of farms comprising parts of multiple units as large farms and of farms locally considered large, the total number of farms and the number of farms reporting various items represent overstatements for farms meeting the large farm criteria.

Data for a considerable number of items are given in table 28 for all large farms. These data are not subject to sampling errors as they represent totals for the complete enumeration of all large farms.

Cows milked and milk production by number of cows milked.—The tabulation of cows milked, milk produced, and butter sold by number of cows milked was based upon farms included in the sample. Totals for these items for all farms, but not by number of cows milked, are published in volumes I and II of the Reports for the 1945 Census of Agriculture. However, as these items tabulated by number of cows milked were obtained from a sample, the totals given in table 1 will not agree exactly with those published in volumes I and II of the Reports for the 1945 Census of Agriculture.

The data given in table 1 for butter churned are based upon an inquiry made for only farms included in the sample. The inquiry was "Butter churned on this farm in 1944."

Since all the data given in table 1 are based upon a sample, they are subject to sampling errors. The magnitude of these sampling errors can be determined from the data given in table c, on page 11, for item totals and from table a for numbers of farms reporting.

Milking machines.—The inquiry made for only farms included in the sample was, "Does this farm have a milking machine?"

The data for the number of farms reporting milking machines are given in table 1 by number of cows milked. The United States and State totals in table 1 for the number of farms reporting milking machines include the number of farms reporting milking machines but not reporting cows milked.

Since the figures on the number of farms reporting milking machines are based upon a sample, they are subject to sampling errors. The magnitude of the sampling errors can be determined from the data given in table a, page 7.

TABLE b.—CRITERIA, FOR THE SELECTION OF LARGE FARMS, BY REGIONS AND STATES

Region and State	All land in farms (acres)	Total of cropland harvested and crop failure (acres)	All cattle and calves (number)	All sheep and lambs (number)	Value of major product sold, traded, or used by farm households (dollars)
Region I:					
Connecticut	1,000	750	200	600	60,000
Delaware	1,000	750	200	600	60,000
District of Columbia	1,000	750	200	600	20,000
Illinois	1,000	750	300	1,000	60,000
Indiana	1,000	750	200	1,000	40,000
Iowa	1,000	750	300	1,000	70,000
Maine	1,000	750	200	600	40,000
Maryland	1,000	750	200	600	40,000
Massachusetts	1,000	750	200	600	70,000
Michigan	1,000	750	200	1,000	40,000
Minnesota	1,000	750	200	1,000	60,000
New Hampshire	1,000	750	200	600	40,000
New Jersey	1,000	750	200	600	80,000
New York	1,000	750	200	600	70,000
Ohio	1,000	750	200	1,000	60,000
Pennsylvania	1,000	750	200	600	60,000
Rhode Island	1,000	750	200	600	60,000
Vermont	1,000	750	200	600	40,000
West Virginia	1,500	750	200	600	30,000
Wisconsin	1,000	750	200	600	40,000
Region II:					
Alabama	2,000	750	200	600	30,000
Georgia	2,000	750	200	600	40,000
Kentucky	1,000	750	200	600	40,000
Mississippi	2,000	750	200	600	60,000
Missouri	2,000	750	300	1,000	60,000
North Carolina	1,500	750	200	600	40,000
South Carolina	2,000	750	200	600	40,000
Tennessee	1,000	750	200	600	30,000
Virginia	2,000	750	200	600	50,000
Region III:					
Florida	2,000	750	1,000	600	60,000
Region IV:					
Arkansas	1,500	750	200	600	60,000
Louisiana	2,000	750	400	600	50,000
New Mexico	20,000	1,000	1,000	4,000	60,000
Oklahoma	4,000	1,000	800	600	40,000
Texas	20,000	1,000	1,000	6,000	60,000
Region V:					
Colorado	10,000	1,000	800	6,000	80,000
Kansas	7,500	1,000	800	1,000	60,000
Montana	20,000	1,000	1,000	6,000	80,000
Nebraska	10,000	1,000	1,000	1,000	60,000
Nevada	10,000	1,000	1,000	4,000	60,000
North Dakota	7,500	1,000	400	1,000	40,000
South Dakota	10,000	1,000	400	1,000	40,000
Utah	7,500	1,000	600	6,000	40,000
Wyoming	20,000	1,000	1,000	6,000	80,000
Region VI:					
Arizona	20,000	1,000	1,000	4,000	80,000
California	10,000	1,000	1,000	4,000	120,000
Region VII:					
Idaho	5,000	1,000	600	4,000	60,000
Oregon	10,000	1,000	800	4,000	70,000
Washington	5,000	1,000	600	4,000	60,000

Chickens on hand, eggs produced, and chickens raised by number of chickens on hand.—In order to provide comparative figures for similar tabulations in earlier censuses, chickens on hand, eggs produced, and chickens raised, were tabulated for farms classified by number of chickens over 4 months old on hand, Jan. 1, 1945. Inquiries for all three of these items were included in the general census, but totals had previously been presented only for counties and States. Figures for the 1945 Census, shown in table 2, were based upon the reports from only those farms included in the sample and, hence, will not agree exactly with those published in volume I and volume II of the Reports for the 1945 Census of Agriculture.

TABLE c.—SAMPLING RELIABILITY OF ESTIMATED NUMBERS OF COWS MILKED, GALLONS OF MILK PRODUCED, AND BUTTER CHURNED AND SOLD, BY NUMBER OF COWS MILKED: CENSUS OF 1945[1]

If the estimated number of farms reporting in the number of cows milked class is—	Then the chances are about 19 in 20 that the estimated number of cows milked, gallons of milk produced, or amount of butter churned or sold would differ from the results of a complete tabulation by less than—				
	Cows milked or gallons of milk (percent)	Butter churned		Butter sold	
		Less than 10 cows in herd (percent)	10 or more cows in herd (percent)	Less than 10 cows in herd (percent)	10 or more cows in herd (percent)
50	165	165	330	390	200
100	115	115	230	275	140
250	75	75	150	175	90
500	52	52	104	120	65
750	43	43	85	100	52
1,000	37	37	74	85	45
2,000	26	26	52	60	32
3,000	21	21	43	50	26
5,000	16	16	33	39	20
7,500	13	13	27	32	16
10,000	12	12	23	27	14
15,000	9.5	9.5	19	22	12
25,000	7.4	7.4	15	17	9.0
50,000	5.2	5.2	10	12	6.4
100,000	3.7	3.7	7.4	8.6	4.5
250,000	2.3	2.3	4.7	5.5	.....
500,000	1.6	1.6	3.3	3.9	.....
1,000,000	1.2	1.2	2.3	2.7	.....
1,500,000	0.95	0.95	1.9	2.2	.....

[1] Adjustment downward of the differences given for groups containing a large number of cows milked per farm will be important for States in which a substantial proportion of the item total is reported on large farms.

The figures given in table 2 for chickens raised represent an understatement. The reports for chickens raised for all farms were incomplete as some enumerators did not always provide reports on the number of chickens raised and as some enumerators omitted chickens raised when the baby chicks were purchased, or when the chickens raised were sold or consumed before they were four months old. Adequate adjustments for the underreporting of chickens raised were not made for farms included in the sample and, hence, the totals for chickens raised represent an understatement.

TABLE d.—SAMPLING RELIABILITY OF ESTIMATED NUMBERS OF CHICKENS ON HAND, CHICKENS RAISED, AND EGGS PRODUCED BY NUMBER OF CHICKENS ON HAND: 1945 CENSUS OF AGRICULTURE

If the estimated number of farms reporting in the number of chickens on hand class is—	Then the chances are about 19 in 20 that the estimated totals for number of chickens on hand, chickens raised, and eggs produced would differ from the results of a complete tabulation by less than—	
	Chickens on hand	Chickens raised[1] or eggs produced
	Percent	Percent
50	135	165
100	95	115
250	60	75
500	42	52
750	35	43
1,000	30	37
2,000	21	26
3,000	17	21
5,000	13	16
7,500	11	14
10,000	9.5	12
15,000	7.7	10
25,000	6.0	7.4
50,000	4.2	5.2
100,000	2.9	3.7
250,000	1.9	2.3
500,000	1.3	1.6
1,000,000	0.95	1.2
1,500,000	0.77	0.95

[1] See text for discussion of possible biases in the estimates not measured by the difference given.

As the figures given in table 2 are based on tabulations for only the farms included in the sample, they are subject to sampling errors. Measures of the relative sampling errors for the figures for a size-of-flock group for the United States or a State can be determined from table d; and for numbers of farms reporting, from table a, page 7. These measures do not contain allowance for biases in underreporting.

Horses and mules.—Data on the age distribution of horses and mules were obtained on a sample basis. The inquiries made for the sample of all farms were for horses: Horses 2 years old and over, colts 1 year and under 2, and colts under 1 year; and for mules: Mules 2 years old and over, mule colts 1 year and under 2, and mule colts under 1 year.

The two inquiries for horses and mules for all farms called for the total number of all ages for each of these classes. The answers for these two inquiries have been tabulated for farms included in the sample and are given in the first two columns in tables 3 and 4. The total for the horses 2 years old and over, colts 1 year and under 2, and colts under 1 year will, in most cases, be less than the total given for horses of all ages because the Census enumerator did not secure a report for the distribution of horses by age groups for every sample farm on which he reported horses of all ages. The situation regarding mules was similar to that for horses. Therefore, the totals given in tables 3 and 4 represent slight understatements of the number of horses or mules 2 years old and over, colts 1 year and under 2, and colts under 1 year. On the other hand, in some cases, the sum of the horses and mules distributed by age groups exceeded the total number of horses or mules of all ages. It is probable that this situation arose because of the omission of young colts from the total for all ages on some farms.

In some States, principally the Southern States, horses or mules on cropper or tenant farms were reported by age groups and not for the total of all ages. However, in such cases, the total horses or mules of all ages were usually reported on the "home" farm of the multiple unit or plantation. As a result of this reporting procedure, the number of farms reporting horses or mules 2 years old and over is overstated in tables 3 and 4 and, in fact, exceeds in some cases the number of farms reporting total horses or mules.

The sampling reliability of the percentages of animals by age group is indicated by footnotes in the tables, and for numbers of farms reporting by table a, page 7. These percentages, in general, have somewhat greater reliability than the estimated numbers in the table from which they are derived. Estimates of the number of horses and mules by age groups made by multiplying these percentages by the number of horses or mules, as published for all farms in volume I or volume II of the Reports for the 1945 Census of Agriculture, will have the same reliability as the corresponding percentages. In cases where the number of animals reported on large farms represents a substantial proportion of the Census total, the sampling errors indicated may be considerably larger than is in fact the case (see general discussion of sampling reliability, page 6).

Cattle by sex and age.—Figures on the distribution of cattle by sex and age were obtained on a sample basis. The inquiry on cattle made on all farms called for the total number of all ages. The eight inquiries made for a sample of farms called for the number of cattle of specified sex and age groups as follows:

Cows and heifers 2 years old and over kept for milk.
Cows and heifers 2 years old and over not kept for milk.
Heifers 1 year old and under 2 kept for milk cows.
Heifers 1 year old and under 2 not kept for milk cows.
Steers 1 year old and over.
Bulls 1 year old and over.
1944 heifer calves.
1944 bull calves and steer calves.

Census enumerators had difficulty in reporting properly the distribution of the total cattle and calves on the farm by sex and age groups. An examination of the reports for individual farms indicated that the greatest difficulty occurred in reporting cows and heifers 2 years old and over not kept for milk. In some cases, for cows and heifers 2 years old and over not kept for milk, enumerators reported all cattle and calves not forming part of the milking herd; in other cases, they reported all female cattle not forming a part of the milking herd; and in other cases, they included all the cattle on the farm except cows and heifers 2 years old and over kept for milk.

In the examination of tabulations prior to publication, the sum of the cattle and calves reported for the various sex and age classes for groups of farms was compared with the total number of cattle and calves obtained by tabulating the cattle and calves of all ages for the farms in the same group. Likewise, the sum of the reports for cows and heifers 2 years old and over kept for milk, and cows and heifers 2 years old and over not kept for milk, was compared for groups of farms with the tabulated total of the reports for cows and heifers 2 years old and over for the farms in the same group. Whenever these comparisons revealed a significant difference between the two sets of data, reports for individual farms were examined and corrections were made of obviously incorrect sex and age distribution made by Census enumerators.

The figures given for farms reporting and number of all cattle and calves, and for cows and heifers 2 years old and over in tables 5, 28, and 29 are for those farms included in the sample for which the sex and age distribution of cattle was reported. Since the sex and age distribution of cattle was not reported for all farms included in the sample, these estimates for all cattle and calves and for cows and heifers 2 years old and over represent an understatement.

Since the figures on the distribution of cattle by sex and age were based on a sample, they are subject to sampling errors. The sampling errors for the percentage distribution of cattle by sex and age are indicated by footnotes on table 5. The numbers given in table 5 are presented as basic data for the percentage distribution by sex and age as the figures for the number of farms reporting and number of cattle in each sex and age group represent an understatement. Improved estimates for the number of cattle for each sex and age group can be secured by multiplying the total for all cattle and calves as given in volume I or volume II of the Reports for the 1945 Census of Agriculture by the percentages given in table 5. Estimates prepared in accordance with this procedure will be subject to the same sampling errors as the percentages. Since large farms accounted for a substantial proportion of all cattle in many States, the sampling errors given may represent overstatements. Adjustment for this fact may be made as outlined in the general discussion of sampling reliability.

Sheep and lambs by sex and age.—The data on the sex and age distribution of sheep and lambs were collected on a sample basis, while data on the number of sheep and lambs of all ages, and for ewes and ewe lambs kept for breeding ewes, were collected for all farms. The inquiries for the sex and age of sheep and lambs were as follows:

Ewes 1 year old and over.

Ewe lambs under 1 year.

Wether and ram lambs under 1 year.

Wether and ram lambs 1 year old and over.

The figures given for the number of farms reporting and number of sheep and lambs by sex and age groups in table 6 represent an understatement as not all farms reporting sheep and lambs reported the distribution by sex and age. The estimated number of farms reporting and the number of sheep on farms for which the sex and age distribution was not reported are given also in table 6. More precise estimates for the number of sheep and lambs in each sex and age group can be secured by multiplying the total for all sheep and lambs given in volume I or volume II of the Reports for the 1945 Census of Agriculture by the percentages for sex and age groups given in table 6.

As the figures on the distribution of sheep and lambs by sex and age groups were based upon a sample they are subject to sampling errors. The sampling errors for the percentage distributions by sex and age are given by footnotes in table 6. However, as a large percent of all sheep and lambs were reported on specified large farms in many States, and as reports for sex and age were secured for these large farms, the sampling errors given represent an overstatement of the actual sampling errors. (See general discussion of sampling errors, page 6.) The measures also apply to estimates obtained by applying the percentages to totals from the complete census.

Bees and honey.—The inquiries for bees and honey were made on a sample basis only. The inquiries were as follows:

Hives of bees kept by this operator in 1944.

Honey produced by these bees in 1944.

The data on bees and honey were not completely reported and hence the totals are not being published.

Tractors on farms by type of tractor.—The total number of tractors was obtained for all farms, while the number of each type of tractor represented in this total was obtained only on a sample basis. The inquiries made of a sample of all farms called for separate figures on the number of garden tractors, crawler tractors, and tractors other than garden or crawler classified according to whether they had rubber tires on all wheels, rubber tires on rear wheels only, or no rubber tires. Garden tractors were not defined. The type of tractor was not always reported and, when reported, occasionally there were minor differences between the number of tractors reported under the inquiry for all farms and the number reported for type of tractor. For the most part, these discrepancies appeared to represent duplications in the reports by type of tractor, such as would be caused by repeating the number of garden and crawler tractors under "other" tractors on the basis of whether equipped with rubber tires. However, the extent of possible duplications was very small. Only 1.2 percent of the farms reporting tractors reported both garden and wheel-type tractors other than garden and 0.5 percent reported both crawler and "other" tractors with no rubber tires. Another type of discrepancy appeared to be the failure to include garden tractors in the total number of tractors. Rarely was a type of tractor reported in the section of the schedule calling for type of tractor without being reported in the main part of the schedule.

The figures shown in table 8 for total tractors were based on the replies to the inquiry on tractors which was asked for all farms. Because these totals were based on tabulations for a sample of all farms, they do not agree exactly with the corresponding totals published in volumes I and II of the 1945 Census of Agriculture Reports.

Reports of the type of tractor were obtained for approximately 90 percent of the farms reporting tractors. The tractors on the farms not reporting type were classified on the basis of those reporting type of tractor. This distribution by type of tractor was made separately for the segment farms and for the specified large farms. Tractors by type include a minimum of 66,635 "homemade" tractors, as shown in table 8. The general magnitude of sampling error for numbers of tractors of each type is indicated in table 8 by footnotes. Percentages by type derived from the table may be applied to the

total number of tractors from volumes I and II of the Reports for the 1945 Census of Agriculture to obtain somewhat more accurate estimates of numbers by type.

Automobiles, motortrucks, and tractors on farm by year of model.—The year of model of the newest automobile, motortruck, and tractor on the farm, respectively, was obtained in the 1945 Census on a sample basis. Approximately 90 percent as many farms in the sample reported year of model of automobiles as reported numbers of automobiles and about 85 percent as many reported year of model of motortrucks and tractors, respectively, as reported number of motortrucks and tractors. Farms reporting automobiles, motortrucks, or tractors but not reporting year of model were distributed in the same proportions as those for which the year of model was reported.

For farms with two or more automobiles, motortrucks, and tractors the year of model was obtained only for the newest automobile, motortruck, and tractor. Therefore, it was not possible to classify all automobiles, motortrucks, and tractors on farms as to year of model. In the tables presenting comparative figures from the 1940 Census, the number of units not classified is also shown. These units which were not classified represent second, third, etc., units on farms. In addition, tractors not classified in the 1945 Census as to year of model also include garden, crawler, and "homemade" tractors. The inquiry in 1945 was for year of model of newest tractor other than garden and crawler with instructions to report "HM" in lieu of year of model if the tractor was homemade. The number of farms reporting homemade tractors, therefore, constitutes a separate group in the distribution of farms in 1945 by year of model of newest tractor. This count represents an understatement of the number of homemade tractors on farms as all homemade tractors would not have been reported, especially if there was a factory-built tractor on the farm in addition to the homemade tractor, or if there were two or more homemade tractors on the farm.

Comparative figures from the 1940 Census for automobiles, motortrucks, and tractors by year of model represent all farms reporting automobiles, motortrucks, and tractors, respectively, classified on the basis of the year of model of the newest unit. For 1940, the 0.9 percent of the farms reporting automobiles with no report of year of model, the 1.5 percent reporting motortrucks with no report of year of model, and the 3.4 percent reporting tractors with no report for year of model have been distributed in the same proportions as those for which the year of latest model was reported.

Thus, the first automobile, motortruck, and tractor (except for garden, crawler, and "homemade" tractors in 1945) on each farm have been classified by year of model in both censuses. The number classified by year of model represented 88.0 percent of the automobiles on farms in 1945, as compared with 85.5 percent in 1940; 86.4 percent of the motortrucks on farms in 1945, as compared with 90.2 percent in 1940; and 75.9 percent of the tractors on farms in 1945, as compared with 89.9 percent in 1940.

Net increases between 1940 and 1945 in the number of units of 1940 model and probably a part of the increases in the number of units of 1939 model represent in part new units acquired by farmers since 1940, while increases in the number of units of earlier models represent transfers from persons not living on farms to persons living on farms. These net increases indicate that a substantial number of automobiles on farms must represent used cars purchased from persons not living on farms. A part of the increase in the number of older models of motortrucks probably represents motortrucks made by converting automobiles into trucks. The proportion of tractors that moved from nonfarm to farm use between 1940 and 1945 is much smaller than that for automobiles and motortrucks, although the net increase in 1939 models amounted to 9.3 percent and in 1938 models to 8.7 percent. A part of the increase in the number of 1939 models may have been due to 1939 model tractors remaining in the hands of dealers at the time of the 1940 Census.

Net decreases between 1940 and 1945 in the number of automobiles, motortrucks, and tractors of any year model represent approximately the number that had been discarded, converted to other uses, or excluded from the classification because of the purchase of newer units. Thus, changes between 1940 and 1945 in the numbers of automobiles, motortrucks, and tractors for the various year models provide a rough measure of the length of life of automobiles, motortrucks, and tractors on farms.

In the tables showing the farms reporting automobiles, motortrucks, and tractors classified by age of the newest automobile, motortruck, and tractor, respectively, the age was determined on the basis of the year of model reported. For the 1945 Census, the year models 1941 to 1945 were considered less than 5 years of age; year models 1936 to 1940 were considered 5 to 9 years of age; and year models 1935 and earlier, 10 years old and over. For the 1940 Census, the year models 1936 to 1940 were considered less than 5 years of age; the year models 1931 to 1935 were considered 5 to 9 years of age; and year models 1930 and earlier were considered 10 years old and over.

In making comparisons of the data for 1945 and 1940, it must be remembered that the 1945 data are based on a sample and, hence, are subject to sampling errors. The magnitude of these sampling errors may be determined from table a, page 7. All data presented in the tables are based on the sample, although total numbers of automobiles, trucks, and tractors, and farms reporting each based on tabulation of all farms are presented in volumes I and II of the 1945 Census of Agriculture. Estimates of numbers of units by age of model, somewhat more precise than those in the tables, may be obtained by applying the percentage distributions, calculated from the tables presented here, to the total numbers of units as given in volume I or volume II.

Electric motors, stationary gasoline engines, and combines (harvester-threshers) on farms.—Information on electric motors, stationary gasoline engines, and combines on farms was obtained only on a sample basis. The figures, in general, represent a minimum as enumerators occasionally failed to obtain information for every farm included in the sample.

The schedule contained two inquiries for electric motors, one for the number of electric motors 1 horsepower and over, and the other for electric motors under 1 horsepower but at least 1/3 horsepower. No instruction was given to exclude household motors, as it was believed that the exclusion, by the inquiry wording, of motors of less than 1/3 horsepower would suffice to eliminate from the count most household electric motors, such as those in electric refrigerators, vacuum cleaners, etc. It was recognized that some farm motors would be excluded from the count, while a few household motors which equal or exceed 1/3 horsepower would be included. This plan for eliminating household motors was followed because of the difficulty of distinguishing, by definition, between "farm" and "household" motors, especially as some motors, such as those for a water system, might be used in a dual capacity.

One inquiry on stationary gasoline engines called for the number of stationary gasoline engines on the farm with the instruction to report all gasoline engines that were not self-propelled; another called for the horsepower with the instruction that, if there were two or more engines, to give the horsepower of the largest engine. The horsepower was reported for approximately 74 percent of the farms for which engines were reported. Farms reporting gasoline engines but not reporting horsepower have been distributed by horsepower of the largest engine in the same proportion as shown by those farms reporting both gasoline engines and horsepower. For farms with two or more engines, the distribution of farms by horsepower of the largest engine differs appreciably from the distribution of farms by

the horsepower of engines for farms reporting only one gasoline engine. Consequently, two classifications of farms by horsepower of engine are shown. The first includes all farms reporting gasoline engines; the second includes those reporting only one engine.

The figures on farms reporting electric motors, stationary gasoline engines, and combines are subject to sampling errors. The approximate magnitude of the sampling errors in the number of farms reporting for a State may be determined from table a. The footnotes on table 8 indicate the approximate magnitude of the sampling errors for the number of electric motors and stationary gasoline engines.

Specified facilities in the farm operator's dwelling.—Inquiries were made on a sample basis for the following specified facilities in the farm dwelling and were asked of the head of each household living on the farm: (1) kitchen sink with drain, (2) mechanical refrigeration, and (3) power-driven washing machine. The "yes" replies to these inquiries were tabulated for resident farm-operator households. The figures include estimates made for resident operators for whom enumerators failed to obtain all the household information (asked only on a sample basis) by distributing the number of resident operators, as obtained in the inquiry on residence (asked of all farm operators), in the same proportions as the replies for resident-operator households listed under the supplementary inquiries. No adjustments were made for partial incompleteness in the reports of the household information for resident farm operators. Consequently, the figure shown for each facility represents a minimum. The figures shown for numbers of resident operators are not in exact agreement with those shown in volumes I and II of the Reports for the 1945 Census of Agriculture, since the figures shown herein represent an expansion of the data reported for the farms included in the sample. The sampling reliability of the estimated number of resident operators reporting specified facilities for their farms is given in table a on page 7.

The data which were obtained on a sample basis for three facility items supplement the data for four facility items for which inquiries were asked for all farms, viz, running water, electricity, radio, and telephone in the farm dwelling.

Specified farm expenditures.—Four inquiries on farm expenditures were included among the items for which information was obtained only on a sample basis. These inquiries called for the amounts spent in 1944 for (1) purchase of livestock and poultry, including amounts spent for baby chicks, poults, chickens, turkeys, and bees, as well as for horses, mules, cattle, hogs, sheep, goats, etc.; (2) commercial fertilizer, including the value of fertilizer furnished under Agricultural Conservation Programs; (3) lime or other liming materials for use on the soil, including the value of lime and other liming materials furnished under Agricultural Conservation Programs and specifically excluding the cost of lime used for spraying, disinfecting, etc.; and (4) seeds, bulbs, plants, and trees. No information was obtained on the number of livestock or poultry, the tonnage of fertilizer or lime, or quantities of seeds, bulbs, plants, and trees represented by these expenditures. These four expenditure items supplement two inquiries on expenditures—one for cash paid for farm labor and the other for cost of feed bought for livestock, dairy, and poultry—which were included among the inquiries asked for all farms. Since enumerators occasionally failed to obtain information for every inquiry, the figures shown represent a minimum.

As the figures for these items are based on a sample, they are subject to sampling errors. The extent of the sampling errors for farms reporting for a State, region, or for the United States can be determined from table a, page 7. The footnotes on table 22 indicate the relative size of the sampling errors for the amount of the expenditure.

Farm population by age, sex, and color.—The farm population inquiries asked for all farms called for the numbers of persons in each of four age-sex groups. Farm population was defined as all persons living in occupied dwellings on farms with specific instructions to exclude inmates of institutions, persons living in dwellings rented to others (other than the farm operator), and those living in tourist camps. The supplementary inquiries, for which information was obtained on a sample basis, asked for the age, sex, and color of each individual. Occasionally this supplementary information was not reported. Therefore, in the table showing age breakdown by 5-year groups, the figures for total persons represent an estimate based on farms included in the sample, while the distribution of this total by age, sex, and color was based on the reports for the farms included in the sample and reporting age, sex, and color for each person on the farm.

In the tables showing numbers of persons in each of four broad age-sex groups, the age-sex distribution is based on the tabulation of data for farms included in the sample. Therefore, these figures will not agree exactly with those shown in the more detailed age-sex-color classification.

Totals for corresponding age-sex-color classes are available for the rural-farm population in the 1940 Census of Population Reports. The figures, however, are not strictly comparable. Although there were large net losses in the farm population between 1940 and 1945, the difference between the total farm population reported in the 1940 Census of Population and the total reported in the 1945 Census of Agriculture represents a very considerable overstatement of the actual decreases. Reference should be made to Chapter V, Volume II, of the Reports of the 1945 Census of Agriculture for discussion of the comparability of the data on farm population for 1940 and 1945.

The figures for farm population for all farms as given in volumes I and II of the Report for the 1945 Census of Agriculture represent an understatement of the farm population not exceeding 850,000 persons because of the failure to enumerate all the persons living in the second, third, etc., dwelling on farms. For the farms included in the sample, the enumerator was instructed to list each person living on the farm by name. This procedure apparently resulted in a more complete enumeration of persons living in the second, third, etc., dwelling on farms included in the sample and therefore the figures given in tables 23, 24, 28, and 29 for total farm population may more nearly represent actual farm population, particularly for the United States and for geographic regions, than do the data given for all farms in volumes I and II of the Reports for the 1945 Census of Agriculture.

Errors of sampling must also be taken into account when making comparisons with 1940 data, or of one group with another. The magnitude of the possible errors in the farm population figures which

TABLE e.—SAMPLING RELIABILITY OF ESTIMATED FARM POPULATION: 1945 CENSUS OF AGRICULTURE

If the estimated farm population in the class is—	Then the chances are about 19 in 20 that the estimated farm population in the class would differ from the results of a complete enumeration by less than[1]—	
	Age or age-sex class	Age-color or age-sex-color class
	Percent	Percent
50	145	200
100	100	145
250	64	90
500	45	64
1,000	32	45
2,500	20	28
5,000	14	20
7,500	12	16
10,000	10	14
15,000	8.2	12
25,000	6.4	9.0
50,000	4.5	6.4
100,000	3.2	4.5
250,000	2.0	2.8
500,000	1.4	2.0
1,000,000	1.0	1.4
2,000,000	0.70	1.0
5,000,000	0.45	0.64

[1] For the following States the given percentage differences should be multiplied by 7/4:
California, Indiana, Iowa, Kansas, North Carolina, Ohio, Pennsylvania

are attributable to sampling may be determined from table e. The percentage distributions for the farm population as given in tables 23 and 24 have greater reliability than the corresponding estimated totals.

Year of occupancy and years on farm.—The year the operator began to operate (continuously) the farm he was occupying on the census date was asked of all operators. The figures shown in this report for this item were obtained by tabulating, on a sample basis, the replies to this inquiry. The data reflect the stability or instability of farm operators on particular farms. They do not necessarily represent the total years of farm experience. When the data are presented in terms of the replies to the inquiry, they are referred to as "year of occupancy"; when translated into the length of time operators have been occupying their farms, they are referred to as "years on farm." The average year of occupancy was obtained by making a summation of the years of occupancy and dividing the total by the number of operators for which this item was reported. The resulting quotient was shown as a whole number. For example, if the average was in excess of 1931, but less than 1932, the average year of occupancy was shown as 1931. In translating the average year of occupancy into average number of years on farm, the average year of occupancy should be subtracted from 1945, the census year.

As the figures given in table 25 were based upon tabulations for a sample of all farms, they are subject to sampling errors. The magnitude of the sampling errors for estimated numbers of farms can be determined from the data given in table a, page 7. Percentages shown in the table have somewhat smaller sampling errors than the figures for numbers of farms.

Area in farm garden.—The value of vegetables grown on the farm for use by the households on the farm was obtained for all farms. The area of farm garden was obtained only on a sample basis. The inquiry called for acres and tenths of acres with instructions to report areas of less than one-tenth acre as "less." All farms in the sample which reported value of vegetables grown on the farm for use by households on the farm were classified on the basis of the area in the farm garden. Those for which the area was not reported were distributed in the same proportion as those reporting area, such distributions being made separately for farms other than specified large farms and for specified large farms. As these totals were based on a sample of all farms, they are not in exact agreement with those given in volumes I and II of the Reports for the 1945 Census of Agriculture for farms reporting vegetables grown for home (farm households') use. The sampling errors associated with the estimated number of farms in each acreage group are given in table a, page 7.

Irish potatoes by acreage harvested.—The data given in table 26 were estimated from a tabulation of the figures for the acreage and production of Irish potatoes for farms included in the sample. Therefore, the figures given in this table will not agree exactly with those published in volume I and volume II of the Reports of the 1945 Census of Agriculture.

As the figures given in table 26 are based on tabulations for only the farms included in the sample, they are subject to sampling errors. The magnitude of these sampling errors can be determined from the data given in table f. More precise estimates of farms reporting, acreage, and production of Irish potatoes by acreage harvested can be secured by calculating percentage distributions on the basis of data given in table 26 and then multiplying these percentages by the figures for farms reporting, or acreage or production as given in volume I or volume II of the Reports for the 1945 Census of Agriculture.

Farms by economic class.—The classification of farms by economic class has been made for the purpose of segregating groups of farms and farmers that are somewhat alike in their characteristics so that an accurate description can be made of the farms in each group.

TABLE f.—SAMPLING RELIABILITY OF ESTIMATED ACREAGE AND PRODUCTION OF IRISH POTATOES BY ACREAGE HARVESTED: 1945 CENSUS OF AGRICULTURE

If the estimated number of farms reporting in the acreage class is—	Then the chances are about 19 in 20 that the estimated total acreage or production for the acreage class would differ from the results of a complete tabulation by less than [1] —
	Percent
50	200
100	145
250	90
500	65
750	55
1,000	45
2,000	32
3,000	26
5,000	20
7,500	17
10,000	15
15,000	12
25,000	9.2
50,000	6.6
100,000	4.6
250,000	2.8
500,000	2.0
1,000,000	1.5
1,500,000	1.1

[1] These differences should be only 3/4 as large for classes less than 25 acres. To obtain a more precise difference for any particular State, the difference may be multiplied by the proportion of the total acreage or production on farms other than large farms.

The classification of farms by economic class supplements other farm classifications made on the basis of area (size of farm), tenure of farm operator, type of farm, and value of products. Data for these other classifications of farms appear in volume I and volume II of the Reports for the 1945 Census of Agriculture.

In establishing the criteria to be used for classifying farms by economic class, several factors were considered. In general, there was agreement that one of the principal bases for the classification should be gross farm income or total value of farm products. Preliminary classification of farms by total value of products indicated that a considerable number of farms would not be classified in the proper group because the value of products for one year may be depressed below the appropriate level for the farm because of crop failure, increasing inventories instead of sales, the beginning of operations on a new farm, incompleteness in the reports on the sales of farm products, etc. After consultation with members of the staff of the Department of Agriculture, it was decided to use the value of land and buildings as a secondary criterion, largely as a correction factor to take into account unusual factors affecting the value of products for a single year for an individual farm.

The proposals advanced for a classification of farms by economic class called for the separation of farms on which a major share of the labor was hired from farms on which the major share of the work was performed by the farmer and unpaid members of his family. (See "Need for a New Classification of Farms" by M. R. Benedict, F. F. Elliott, H. R. Tolley, and Conrad Taeuber: Journal of Farm Economics, Vol. XXVI, No. 4, November 1944.)

In the preliminary and test tabulations made for a sample of approximately 18,000 farms, cash expenditures for hired labor were considered as one of the criteria for the classification. However, it was found that many farmers apparently secured assistance for carrying out their farm operations through the use of contract labor, custom work, and the hiring of machine work and, since the expenditures for these types of farm work were not included in the expenditures for cash wages, the use of cash wages as a criterion was abandoned.

As part-time farms comprise a relatively large group of farms having distinct characteristics, provision was made to place such

farms in a separate class. Each class is defined in terms of the total value of products sold or used by farm households and the value of land and buildings, or the total value of products, the value of land and buildings, and the number of days the farm operator worked off the farm. The classes are mutually exclusive.

The composition of the various economic classes of farms subject to the exceptions explained below was as follows:

Class I:
- (a) Farms with a value of products of $20,000 or more and a value of land and buildings of at least $15,000.
- (b) Farms with a value of land and buildings of $70,000 or more and a value of products of $8,000 to $19,999.

Class II:
- (a) Farms with a value of products of $8,000 to $19,999 and a value of land and buildings of less than $70,000.
- (b) Farms with a value of land and buildings of $30,000 to $69,999 and a value of products of $3,000 to $7,999.
- (c) Farms with a value of products of $20,000 and over and a value of land and buildings of $5,000 to $14,999.

Class III:
- (a) Farms with a value of products of $3,000 to $7,999 and a value of land and buildings of less than $30,000.
- (b) Farms with a value of land and buildings of $20,000 to $29,999 and a value of products of $1,200 to $2,999.
- (c) Farms with a value of products of $20,000 or more and a value of land and buildings of less than $5,000.

Class IV:
- (a) Farms with a value of products of $1,200 to $2,999 and a value of land and buildings of less than $20,000.
- (b) Farms with a value of land and buildings of $8,000 to $19,999 and a value of products of $500 to $1,199.

Class V:
Farms with a value of products of $250 to $1,199, a value of land and buildings of less than $8,000, and the farm operator working off the farm 100 days or more in 1944.

Class VI:
Farms with a value of products of $500 to $1,199, a value of land and buildings of less than $8,000, and the farm operator working off the farm less than 100 days in 1944.

Class VII:
All other farms not included in Class I to VI, inclusive. This group includes—
- (a) Farms with a value of products of less than $250.
- (b) Farms with a value of products of $250 to $449, a value of land and buildings less than $8,000, and the farm operator working less than 100 days off the farm in 1944.
- (c) Farms with a value of land and buildings of $70,000 or over and a value of products of less than $8,000.
- (d) Farms with a value of land and buildings of $30,000 to $69,999 and a value of products of less than $3,000.
- (e) Farms with a value of land and buildings of $20,000 to $29,999 and a value of products of less than $1,200.
- (f) Farms with a value of land and buildings of $8,000 to $19,999 and a value of products under $500.

In classifying farms, the reports for farms falling near the borderline of the class were examined to determine the proper economic class into which such farms should be placed.

Farms with the following characteristics were selected for individual examination and for the determination of the appropriate class of the farm on the basis of an examination of the report for all items for that farm.

Class I:
- (a) Farms with a value of land and buildings of $70,000 or more and with an expenditure of less than $1,500 for cash wages for hired labor and/or a value of products of less than $8,000.
- (b) Farms with a value of products of $20,000 or more and a value of land and buildings of less than $15,000.

Class II:
- (a) Farms with a value of land and buildings of $30,000 to $69,999 and a value of products of less than $3,000.

Class III:
- (a) Farms with a value of land and buildings of $20,000 to $29,999 and with a value of products of less than $1,200.

Class IV:
- (a) Farms with a value of land and buildings of $8,000 to $19,999 and a value of products of less than $500.

The purpose of making a special examination of farms listed above under (a) for Class I, Class II, Class III, and Class IV was to eliminate institutions, country estates, and similar types of farms from Classes I to VI, inclusive, and to classify properly those farms which, because of unusual circumstances, had an abnormally low value of products in 1944. Institutions, country estates, and farms having a high value of land and buildings because of being located in or near an urban center were placed in Class VII. On the other hand, farms with crop failure, farms building up inventories, farms with significantly different operations in 1945 from those in 1944, and farms not operated in 1944 but operated in 1945 were placed in the appropriate class on the basis of all the data reported for these farms.

Farms under (b) for Class I were specially examined and classified in order that feed lots and broiler and similar establishments having a relatively low value of land and buildings but a relatively large value of products could be assigned to the appropriate class. (See group (c) under Classes II and III.)

Data for farms classified by economic class are given in table 29. A large part of these data relate to items for which information was secured for all farms. However, the figures given in this table represent estimates based on reports for farms included in the sample. Therefore, totals given in table 29 for items such as cropland harvested, number of automobiles, etc., will not agree with those published in volume I and volume II of the Reports for the 1945 Census of Agriculture. The following tables present figures showing the extent of sampling errors for various items included in this table.

TABLE g.—SAMPLING RELIABILITY OF ESTIMATED TOTALS FOR ITEMS BY ECONOMIC CLASS: 1945 CENSUS OF AGRICULTURE[1]

Item	The chances are about 19 in 20 that the difference between the estimated item total for the economic class and the results of a tabulation for all farms would be[2]—	
	Less than 10% if the number of farms reporting is more than—	Less than 30% if the number of farms reporting is more than—
Total land in farms	20,000	2,000
Cropland harvested	2,000	200
Value of land and buildings	30,000	3,000
Value of implements and machinery	30,000	3,000
Number of trucks	15,000	1,500
Number of tractors	15,000	1,500
Number of automobiles	15,000	1,500
Farm population, total or by age and sex	4,000	400
Cost of feed bought	35,000	3,500
Expenditures for:		
Livestock and poultry	75,000	7,500
Commercial fertilizer	35,000	3,500
Lime and liming materials	45,000	4,500
Seeds, bulbs, etc.	45,000	4,500
Number of stationary gas engines	15,000	1,500
Number of combines	15,000	1,500
Value of:		
All farm products sold or used	15,000	1,500
Total farm products sold	15,000	1,500
Fruits and nuts sold	75,000	7,500
Vegetables sold	75,000	7,500
Horticultural specialties sold	30,000	3,000
All other crops sold	20,000	2,000
Dairy products sold	35,000	3,500
Poultry and poultry products sold	70,000	7,000
Livestock and livestock products sold	70,000	7,000
Forest products sold	70,000	7,000
Farm products used by farm households	2,000	200

[1] In comparing estimated totals from table 29 for economic class, it should be borne in mind that for estimates for the United States, and for geographic divisions and the larger States, sources of error other than sampling become relatively more important than sampling variation. The special examination of certain farms and the resulting exceptions, as described above, may have introduced a small subjective source of variation in the data that is not measured by figures for sampling reliability.

[2] For economic class I the numbers given should be multiplied by 2. However, for this class the downward adjustment for large farms of the given number of farms necessary for the given error limits becomes important (see general discussion of sampling reliability on page 6). Such adjustment is also important for many of the items, such as the value of horticultural specialties sold or expenditures for livestock and poultry.