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## CHAPTER 3

### AGRICULTURE <sup>1</sup>

#### § 3a. Sources of Information

The statistics utilized in this field are derived mainly from the Census and from the reports of the Department of Agriculture. As this is one of the largest of the nation's industries, it is fortunate that the data available are both abundant and reasonably reliable. Since, unfortunately, the returns for the Census of 1920 are not yet complete in some respects, it has been necessary in such instances to use the preliminary estimates for about half the States as bases for the 1919 statistics. In certain lines, the Census figures for the volume of production for 1919 are materially lower than are those of the Agricultural Department for the same year. Since the Census estimates are probably the more accurate, they have been relied upon in so far as possible. Even with the Census reports for twenty-three States still unavailable in some fields, it nevertheless appears probable that the percentage of error in the figures for this industry is lower than the like percentages for many of the other fields.

#### § 3b. Method of Procedure

The method adopted in order to arrive at the net value product of the industry has been to deduct from the gross value product all payments to other industries for their goods or services used in agricultural production. The remainder represents the amount left as a reward for the services of persons or property devoted to the agricultural field. The general plan of procedure is illustrated by the following examples.

Nearly half of the total crop yield is fed to livestock. The remainder is either sold to outside purchasers or consumed by the farmers themselves. Both sales and consumption evidently form part of the net income of agriculture. In addition to crops, the agricultural industry turns out a great quantity of livestock products in the form of draft animals, milk cows, milk, butter, meat, eggs, honey, wool, and mohair. Farmers also contribute each year to the national income by bringing into a state of cultivation a large area of previously unimproved land.

Manifestly, however, this output cannot all be ascribed to the labors of agriculturalists alone; for, in order to keep up production, farmers must

<sup>1</sup> Drs. L. C. Gray and O. C. Stine of the U. S. Department of Agriculture have given very helpful suggestions which have been utilized in this chapter.

buy from other industries fertilizers, tools, machinery, automobiles, gasoline, harness, and saddles, and also a certain amount of bank credit and fire insurance. Payments for these articles and services must, therefore, be estimated and subtracted.

In certain years, farmers dispose of their livestock in large numbers, thus bringing in an increased money income, but at the expense of reduced inventories. Evidently, then, accuracy requires that account be taken of the diminution in inventories in figuring up actual production for the year.

### **§ 3c. The Value of Animal Products**

With these fundamentals in mind, we can now proceed to analyze some of the more important items entering into the accounts of this field. Animal products may well be considered first. By combining the reports of the United States Department of Agriculture and the Food Administration, we are able to secure a complete estimate of the value of all meat obtained from the larger animals. This record appears in Table 3A.

TABLE 3A

## THE VALUE OF THE LARGER DOMESTIC ANIMALS GROWN AND SLAUGHTERED IN THE CONTINENTAL UNITED STATES

| A         | B  | C                                       | D  | E   | F               | G   |
|-----------|--|---|--|---|-----------------|---|
| Year      | Estimated production in millions of pounds | Index of average meat prices to farmers | Index of total value meat produced (Millions) $\frac{B \times C}{100}$ | Estimated total value to farmers of all animals slaughtered (Thousands) | Ratio of E to D | Estimated total value to farmers of all animals slaughtered (Millions) $F \times D$ |
| 1909..... | 19,752 <sup>a</sup>                        | 6.05 <sup>d</sup>                       | 1,195  | \$1,381,303 <sup>f</sup>  | 1.156           | \$1,381   |
| 1910..... | 17,390 <sup>c</sup>                        | 6.88 <sup>d</sup>                       | 1,196  |   |                 | 1,382   |
| 1911..... | 19,131 <sup>b</sup>                        | 5.74 <sup>d</sup>                       | 1,098  |   |                 | 1,269   |
| 1912..... | 18,249 <sup>b</sup>                        | 6.24 <sup>e</sup>                       | 1,138  |   |                 | 1,314   |
| 1913..... | 18,474 <sup>b</sup>                        | 7.03 <sup>e</sup>                       | 1,299  |   |                 | 1,501   |
| 1914..... | 17,706 <sup>b</sup>                        | 7.23 <sup>e</sup>                       | 1,280  |   |                 | 1,480   |
| 1915..... | 19,540 <sup>b</sup>                        | 6.64 <sup>e</sup>                       | 1,298  |   |                 | 1,500   |
| 1916..... | 21,030 <sup>b</sup>                        | 7.79 <sup>e</sup>                       | 1,638  |   |                 | 1,892   |
| 1917..... | 18,692 <sup>b</sup>                        | 11.52 <sup>e</sup>                      | 2,154  |   |                 | 2,489   |
| 1918..... | 22,337 <sup>b</sup>                        | 13.54 <sup>e</sup>                      | 3,025  |   |                 | 3,497   |
| 1919..... | 22,564 <sup>a</sup>                        | 13.87 <sup>d</sup>                      | 3,130  |   |                 | 3,618   |
| 1920..... | 21,000 <sup>g</sup>                        | 11.84 <sup>d</sup>                      | 2,487 <sup>g</sup>   |   |                 | 2,874 <sup>g</sup>  |

<sup>a</sup> U. S. Dept. of Agriculture, *Monthly Crop Reporter*, March, 1919, p. 30, and March, 1920, p. 27.

<sup>b</sup> U. S. Food Administration, Stephen Chase, *Production of Meat in the United States*, p. 80.

<sup>c</sup> 0.91 of the 1911 amount, this being the ratio of the 1910 to the 1911 quantity of livestock shipped on railways as shown by the *Statistics of Railways*, published by the Interstate Commerce Commission.

<sup>d</sup> Extended back from 1912 and forward from 1918 on the basis of the tables in the *Monthly Crop Reporters* for March, 1920, p. 28, and February, 1921, p. 11.

<sup>e</sup> *Monthly Crop Reporter*, February, 1919, p. 19.

<sup>f</sup> From data in the *Census of Manufactures* for 1910, Vol. VIII, p. 380, and from the *Abstract of the Census* for 1910, pp. 356 and 478, it is possible to calculate that, in 1909, retail slaughter houses killed 4,088,000 beefs, 2,880,000 calves, 1,940,000 sheep and lambs, 3,970,000 hogs and 135,000 goats and miscellaneous animals. If the animals in each of these classes were on the average worth the same as the animals slaughtered on farms, their value was \$178,636,000. Wholesale slaughterhouses paid farmers \$960,726,000. From this amount should be deducted the \$28,298,000, which is shown by the *Statistics of Railways* to have been paid as freight on livestock, leaving \$932,428,000 as returns to farmers. In addition, the Census shows that farmers slaughtered animals worth some \$270,239,000. The total value of meat animals to farmers therefore amounted to \$1,381,303,000 in 1909. No allowance is made for profits to dealers and shippers, for it is assumed that the larger part of this class are themselves included by the Census under the heading of agriculture.

<sup>g</sup> Rough preliminary estimate.

Dairy products also form an important part of the output of American farms. In 1909, according to estimates based upon the *Abstract of the Census* of 1910, p. 344, the butter made on farms reporting dairy cows but

no dairy products amounted probably to about \$16,530,000, in addition to the butter valued at \$122,483,000, reported as used on farms. The Census also indicates that milk amounting in value to \$158,700,000, was consumed on the farm as human food, making a total of \$297,713,000, in dairy products used for sustenance by farmers and their families. This amount added to the \$473,769,000, value of dairy products reported as sold by farmers gives \$771,482,000, as the total value of dairy products consumed or sold off the farm by farmers in the year 1909. The method of making estimates for the intercensal years is outlined in Tables 3B and 3C.

TABLE 3B

AN ESTIMATE OF THE VALUE OF DAIRY PRODUCTS CONSUMED BY FARM FAMILIES IN THE CONTINENTAL UNITED STATES

| A       | B   | C  | D  | E   | F   |
|---------|---|--|--|---|---|
| Year    | Index of price of dairy products <sup>a</sup> | Index of number of farms in the U. S. <sup>b</sup> | Index of total value of dairy products consumed by farmers B × C | Dairy products consumed by farm families in 1909 <sup>c</sup> (Thousands) | Estimated dairy products consumed by farm families (Millions) D × E |
| 1909... | 1.000   | 1.000  | 1.000  | \$297,713   | \$298   |
| 1910... | 1.063   | 1.005  | 1.068  |   | 318   |
| 1911... | 1.000   | 1.007  | 1.007  |   | 300   |
| 1912... | 1.076   | 1.009  | 1.086  |   | 323   |
| 1913... | 1.088   | 1.011  | 1.100  |   | 327   |
| 1914... | 1.065   | 1.013  | 1.079  |   | 321   |
| 1915... | 1.064   | 1.014  | 1.079  |   | 321   |
| 1916... | 1.118   | 1.015  | 1.135  |   | 338   |
| 1917... | 1.433   | 1.016  | 1.456  |   | 434   |
| 1918... | 1.783   | 1.017  | 1.813  |   | 540   |
| 1919... | 2.024   | 1.018  | 2.060  |   | 613   |
| 1920... | 2.197   | 1.019  | 2.239  |   | 667   |

<sup>a</sup> A simple arithmetic average of the index for butter prices, (derived from the Year-books of the Dept. of Agriculture,) and the respective indices of retail and wholesale prices of milk as reported by the U. S. Bureau of Labor Statistics.

<sup>b</sup> Based on the U. S. Census reports for 1910 and 1920, numbers for the intermediate years being interpolated along a smooth curve.

<sup>c</sup> For mode of derivation, see the text.

TABLE 3C

## AN ESTIMATE OF THE TOTAL AMOUNT OF DAIRY PRODUCTS SOLD BY FARMERS

| A    | B   | C   | D  | E  | F               | G   | H   | I               | J  |
|------|---|---|--|--|-----------------|---|---|-----------------|--|
| Year | Estimated number of cows kept principally for milk <sup>a</sup> (Thousands) | Estimated number of cows whose products are marketed <sup>b</sup> (Thousands) | Preliminary index of total value of dairy products sold <sup>c</sup> | Value of whole milk and cream purchased by factories in census years (Thousands) | Ratio of E to D | Estimated value of whole milk and cream purchased by factories (Millions) D × F | Value of dairy products sold by farmers in census years (Thousands) | Ratio of H to G | Estimated value of dairy products sold by farmers (Millions) G × I |
| 1909 | 17,010  | 10,680  | 10,680   | \$213,702 <sup>d</sup>   | 20.01/          | \$214   | \$ 473,769 <sup>h</sup>   | 2.217/          | \$ 474   |
| 1910 | 17,120  | 10,738  | 11,435   | -  | 20.78/          | 238   |   | 2.149/          | 511  |
| 1911 | 17,300  | 10,924  | 10,924   |  | 21.52/          | 235   |   | 2.083/          | 490  |
| 1912 | 17,180  | 10,792  | 11,612   |  | 22.30/          | 259   |   | 2.017/          | 522  |
| 1913 | 17,000  | 10,600  | 11,532   |  | 23.11/          | 266   |   | 1.952/          | 520  |
| 1914 | 17,195  | 10,785  | 11,486   | 275,232 <sup>d</sup>   | 23.96/          | 275   |   | 1.885/          | 519  |
| 1915 | 17,645  | 11,227  | 11,946   |  | 24.82/          | 297   |   | 1.819/          | 540  |
| 1916 | 18,335  | 11,910  | 13,315   |  | 25.87/          | 345   |   | 1.753/          | 605  |
| 1917 | 19,000  | 12,568  | 18,010   |  | 26.89/          | 484   |   | 1.687/          | 816  |
| 1918 | 19,325  | 12,887  | 22,979   |  | 27.94/          | 642   |   | 1.621/          | 1,041  |
| 1919 | 19,490  | 13,047  | 26,407   | 770,624 <sup>e</sup>   | 29.18/          | 771   | 1,199,300 <sup>i</sup>  | 1.556/          | 1,199  |
| 1920 | 19,672  | 13,224  | 29,055   |  | 30.15/          | 876   |   | 1.491/          | 1,307  |

<sup>a</sup> Estimate based on Census for 1920, the assumption being that the number in earlier years varied in proportion to the number of dairy cows as estimated by the U. S. Dept. of Agriculture.

<sup>b</sup> Numbers in Column B less 1 cow for each farm allowed for supplying farm families and feeding calves.

<sup>c</sup> Numbers in Column C multiplied by the price indices of dairy products given in Table 3B, Column B.

<sup>d</sup> Census of Manufactures, 1914, pp. 32-33.

<sup>e</sup> Preliminary Report of Census of 1920.

<sup>f</sup> Computed by division.

<sup>g</sup> Interpolated along a smooth curve.

<sup>h</sup> Abstract of U. S. Census for 1910, p. 347.

<sup>i</sup> Estimates based on reports by Census of 1920 for 25 States.

Another important class of animal products consists of poultry and eggs. For these articles, relatively little information is available for the intercensal years. The Census figures themselves are to a considerable extent estimates—hence no high degree of accuracy can be expected in the final results. The interpolations recorded in Tables 3D and 3E have been based upon shipments of poultry and eggs on the railways and receipts at the leading markets combined with the average prices for chickens and eggs as reported by the United States Department of Agriculture.

TABLE 3D

AN ESTIMATE OF THE VALUE OF POULTRY CONSUMED OR SOLD BY FARM FAMILIES

| A     | B  | C  | D  | E   | F                 | G   |
|-------|--|--|--|---|-------------------|---|
| Year  | Preliminary index of quantity of poultry produced <sup>a</sup> | Average price paid farmers for chickens <sup>b</sup> (Cents per lb.) | Index of total value of poultry produced $\frac{B \times C}{10}$ | Census estimate of value of products <sup>c</sup> (Thousands) | Ratio of E to D   | Estimated total net product (Millions) $D \times F$ |
| 1900. | 3,463  | 10.67  | 3,695  | \$192,500   | 52.1 <sup>e</sup> | \$192   |
| 1910. | 3,538  | 11.69  | 4,136  |   | 49.8 <sup>f</sup> | 206   |
| 1911. | 3,651  | 10.72  | 3,914  |   | 48.0 <sup>f</sup> | 188   |
| 1912. | 3,812  | 10.89  | 4,151  |   | 46.0 <sup>f</sup> | 191   |
| 1913. | 3,923  | 11.77  | 4,618  |   | 44.2 <sup>f</sup> | 204   |
| 1914. | 3,992  | 12.21  | 4,874  |   | 42.5 <sup>f</sup> | 207   |
| 1915. | 4,046  | 11.88  | 4,807  |   | 40.8 <sup>f</sup> | 196   |
| 1916. | 4,268  | 13.27  | 5,664  |   | 39.4 <sup>f</sup> | 223   |
| 1917. | 4,030  | 16.67  | 6,718  |   | 38.1 <sup>f</sup> | 256   |
| 1918. | 4,141  | 20.85  | 8,633  |   | 33.7 <sup>f</sup> | 317   |
| 1919. | 4,200 <sup>d</sup>   | 23.84  | 10,012   | \$356,200   | 35.6 <sup>e</sup> | 356   |
| 1920. | 4,000 <sup>d</sup>   | 26.12  | 10,448   |   | 31.5 <sup>f</sup> | 360   |

<sup>a</sup>Sum of thousands of tons of poultry, game and fish originating on railways as freight; one-tenth of cars of live poultry reaching New York City; packages of dressed poultry reaching New York City, divided by 2,000; and 0.3 of number of farms in United States. The last item is added to account for home consumption.

<sup>b</sup>Average of prices for 12 months—see *Monthly Crop Reporter* for December of each year.

<sup>c</sup>95 per cent of value of poultry raised, the other 5 per cent being allowed for losses. See *Abstract of Census of 1910*, p. 353, and preliminary reports of 1920 Census for 25 States.

<sup>d</sup>Preliminary estimate.

<sup>e</sup>Computed by division.

<sup>f</sup>Interpolated along a smooth curve.

TABLE 3E

AN ESTIMATE OF THE VALUE OF POULTRY AND EGGS CONSUMED OR SOLD BY FARM FAMILIES

| A       | B  | C                                       | D  | E   | F   |
|---------|--|---|--|---|---|
| Year    | Millions of dozens of eggs not used for hatching | Average price to farmers per dozen eggs | Total value of eggs to farmers (Millions)<br>B × C | Total value of poultry to farmers <sup>a</sup> (Millions) | Total value to farmers of poultry and eggs consumed or sold (Millions)<br>D + E |
| 1909... | 1,516 <sup>ab</sup>                              | \$0.1926 <sup>b</sup>                   | \$292  | \$192   | \$484   |
| 1910... | 1,600 <sup>c</sup>                               | .1999 <sup>c</sup>                      | 320  | 206   | 526   |
| 1911... | 1,699 <sup>c</sup>                               | .1730 <sup>f</sup>                      | 294  | 188   | 482   |
| 1912... | 1,601 <sup>c</sup>                               | .1986 <sup>f</sup>                      | 318  | 191   | 509   |
| 1913... | 1,561 <sup>c</sup>                               | .1922 <sup>f</sup>                      | 300  | 204   | 504   |
| 1914... | 1,491 <sup>c</sup>                               | .2041 <sup>f</sup>                      | 304  | 207   | 512   |
| 1915... | 1,691 <sup>c</sup>                               | .2005 <sup>f</sup>                      | 339  | 196   | 535   |
| 1916... | 1,629 <sup>c</sup>                               | .2257 <sup>f</sup>                      | 368  | 223   | 591   |
| 1917... | 1,470 <sup>c</sup>                               | .3112 <sup>f</sup>                      | 457  | 256   | 713   |
| 1918... | 1,406 <sup>c</sup>                               | .3644 <sup>f</sup>                      | 512  | 317   | 829   |
| 1919... | 1,544 <sup>ad</sup>                              | .4065 <sup>d</sup>                      | 628  | 356   | 984   |
| 1920... | 1,481 <sup>e</sup>                               | .4460 <sup>f</sup>                      | 660  | 360   | 1,020   |

<sup>a</sup> Number of eggs produced minus two for each fowl raised.

<sup>b</sup> *Abstract of Census* for 1910, p. 353.

<sup>c</sup> Interpolated upon the basis of egg receipts at 7 leading markets.

<sup>d</sup> Preliminary report of 1920, Census.

<sup>e</sup> Rough estimate.

<sup>f</sup> Interpolated upon basis of average monthly prices as reported by the Department of Agriculture.

<sup>g</sup> See Table 3D, Column G.

The fact is worthy of note that though the value has greatly increased, the quantity of eggs produced has actually diminished during the decade, indicating that the per capita egg supply available for the people of the United States is decreasing still more rapidly.

The productions of wool and of mohair are reported for the Census years, presumably with a reasonable degree of accuracy. The interpolation for the intercensal years has been made by aid of the figures from the Department of Agriculture "Desk Sheet" furnished through the courtesy of the Bureau of Crop Estimates. There seems no reason to believe that the figures thus arrived at are seriously in error.



TABLE 3F

AN ESTIMATE OF THE VALUE OF WOOL AND MOHAIR PRODUCED IN THE CONTINENTAL UNITED STATES

| A         | B  | C  | D                  | E  |
|-----------|--|--|--------------------|--|
| Year      | Value reported by the Census (Thousands) | Value of wool as estimated by the Department of Agriculture <sup>c</sup> (Thousands) | Ratio of B to C    | Probable value of product (Millions) C × D |
| 1909..... | \$66,374 <sup>a</sup>                    | \$ 65  | 1.021 <sup>d</sup> | \$ 66                                      |
| 1910..... |  | 72   | .958 <sup>e</sup>  | 69   |
| 1911..... |  | 52   | .942 <sup>e</sup>  | 49   |
| 1912..... |  | 55   | .909 <sup>e</sup>  | 50   |
| 1913..... | 129,000 <sup>b</sup>                     | 51   | .902 <sup>e</sup>  | 46   |
| 1914..... |  | 53   | .887 <sup>e</sup>  | 47   |
| 1915..... |  | 65   | .862 <sup>e</sup>  | 56   |
| 1916..... |  | 80   | .850 <sup>e</sup>  | 68   |
| 1917..... |  | 133  | .827 <sup>e</sup>  | 110  |
| 1918..... |  | 173  | .809 <sup>e</sup>  | 140  |
| 1919..... |  | 162  | .796 <sup>d</sup>  | 129  |
| 1920..... |  | 125  | .784 <sup>e</sup>  | 98   |

<sup>a</sup> Abstract of Census of 1910, p. 352.

<sup>b</sup> Estimated on basis of preliminary bulletin of Census, issued April 11, 1921; allowance made for mohair.

<sup>c</sup> From Desk Sheet of Bureau of Crop Estimates.

<sup>d</sup> Computed by division.

<sup>e</sup> Interpolated along a straight line.

The preliminary estimates of the Census indicate a clip of only 240,000,000 pounds of wool in 1919 as against 289,000,000 pounds in 1909, showing a rather sharp decrease in the physical production of this commodity.

Most business plants have bookkeeping systems and make annual inventories, the changes in which affect the accounts of profit and loss. The Department of Agriculture estimates one very large item in the agricultural inventory at the beginning of each year, namely, the value of live stock on hand. The changes in this item are so large that it seems advisable to take them into account in making up the net totals for the agricultural industry. Since many fluctuations in the total money value of live stock arise solely from changes in prices and hence represent no real variations in the numbers or weights of animals, it has been necessary to use a rather devious plan of computation in order to secure figures which show the magnitude of the changes in the physical quantity on hand, which have occurred between the respective inventory periods. This computation is recorded in Table 3G.

TABLE 3G

AN ESTIMATE OF THE VARIATIONS IN THE VALUE OF THE AGGREGATE OF LIVE STOCK ON THE FARMS OF THE UNITED STATES

| A        | B  | C   | D                  | E   | F   | G  | H   | I   | J  |
|----------|--|---|--------------------|---|---|--|---|---|--|
| Year     | Census estimate of value of all live-stock on farms Jan. 1 <sup>a</sup> (Millions) | Agricultural Department estimate of value of domestic animals <sup>d</sup> on farms Jan. 1 (Millions) | Ratio of B to C    | Probable value of all live-stock (Millions) C × D | Index of prices of farm animals January 15 <sup>a</sup> | Value of all live-stock at 1913 prices Jan. (Millions) E/F | Gain in inventory of animals at prices of 1913 (Millions) | Index of prices of farm animals <sup>k</sup> (Average for year) | Gain in inventory at current prices (Millions) H × I |
| 1909.... |  | \$4,525   | 1.004              | \$4,543   | .845  | \$5,375  | -\$587  | .890  | -\$523   |
| 1910.... | \$4,925 <sup>b</sup>   | 4,911   | 1.003 <sup>f</sup> | 4,925   | 1.029   | 4,788  | + 430   | 1.001   | + 430  |
| 1911.... |  | 5,276   | .995 <sup>g</sup>  | 5,250   | 1.006   | 5,218  | + 382   | .882  | + 337  |
| 1912.... |  | 5,008   | .990 <sup>g</sup>  | 4,960   | .886  | 5,600  | - 188   | .925  | - 174  |
| 1913.... |  | 5,502   | .984 <sup>g</sup>  | 5,412   | 1.000   | 5,412  | + 50  | 1.000   | + 50   |
| 1914.... |  | 5,891   | .977 <sup>g</sup>  | 5,755   | 1.053   | 5,462  | + 408   | 1.002   | + 409  |
| 1915.... |  | 5,969   | .971 <sup>g</sup>  | 5,800   | .988  | 5,870  | + 109   | .938  | + 102  |
| 1916.... |  | 6,021   | .965 <sup>g</sup>  | 5,810   | .972  | 5,979  | - 544   | 1.047   | - 569  |
| 1917.... |  | 6,736   | .958 <sup>g</sup>  | 6,454   | 1.187   | 5,435  | - 525   | 1.412   | - 742  |
| 1918.... |  | 8,284   | .953 <sup>g</sup>  | 7,896   | 1.608   | 4,910  | + 60  | 1.593   | + 96   |
| 1919.... |  | 8,828   | .946 <sup>g</sup>  | 8,352   | 1.681   | 4,970  | + 410   | 1.577   | + 646  |
| 1920.... | \$7,996 <sup>c</sup>   | 8,507   | .940 <sup>f</sup>  | 7,996   | 1.486   | 5,380  | - 85  | 1.398   | - 119  |

<sup>a</sup> Census of 1910 was taken April 15.

<sup>b</sup> Abstract of U. S. Census of 1910, p. 312.

<sup>c</sup> Estimated from U. S. Census reports for 25 States.

<sup>d</sup> Includes horses, mules, cattle, sheep, and swine.

<sup>e</sup> Monthly Crop Reporter and Yearbooks of Dept. of Agriculture.

<sup>f</sup> Computed by division.

<sup>g</sup> Interpolated along a straight line.

<sup>h</sup> Average of indices for meat animals and for horses, weighting the former 2 and the latter 1. Data from Monthly Crop Reporters.

In Table 3H, the values of the various animal products are summarized. The figures used in the derivation of the estimates for honey and wax produced and for horses sold off farms are not shown, as these are relatively minor items and no first class data are available as a basis for interpolation.

The value of horses sold off the farms has been computed on the assumption that one-fourteenth of the city supply is replaced annually. The number of horses in cities is estimated from the Census by aid of a smooth curve. The values per head are those stated in the Census with interpolations for intercensal years based upon the Department of Agriculture reports of farm prices for horses and mules. The numbers multiplied by these average values are used as estimates of the total values of horses and mules sold to supply city needs. To these totals have been added quantities representing 90 per cent of the excess in the value of exports over

imports, it being assumed that the farmers would receive 10 per cent less than the export value.

The estimated amounts representing the production of honey and wax have been roughly interpolated between the values recorded by the Census in 1909 and 1919, the "Desk Sheet" furnished by the Bureau of Crop Estimates being used as an approximate guide. Since the value of wax produced in 1919 has not yet been reported by the Census, a slight adjustment has been made in the reported honey value in order to take both into account.

TABLE 3H

AN ESTIMATE OF THE AGGREGATE FARM VALUE OF ANIMAL PRODUCTS PRODUCED ON THE FARMS AND RANGES OF THE CONTINENTAL UNITED STATES

(Values in Millions of Dollars)

| Year    | All animal products | Larger animals slaughtered <sup>a</sup> | Dairy products <sup>b</sup> | Poultry and eggs <sup>c</sup> | Wool and mohair <sup>d</sup> | Honey and wax <sup>e</sup> | Horses sold for city use <sup>e</sup> | Gains in live-stock inventory <sup>f</sup> |
|---------|---------------------|---|-----------------------------|-------------------------------|------------------------------|----------------------------|---------------------------------------|--|
| 1909... | \$2,218             | \$1,381                                 | \$ 771                      | \$ 484                        | \$ 66                        | \$ 6                       | \$ 31                                 | -\$523                                     |
| 1910... | 3,277               | 1,382                                   | 829                         | 526                           | 69                           | 6                          | 35                                    | + 430                                      |
| 1911... | 2,968               | 1,269                                   | 790                         | 482                           | 49                           | 6                          | 35                                    | + 337                                      |
| 1912... | 2,585               | 1,314                                   | 845                         | 509                           | 50                           | 6                          | 35                                    | - 174                                      |
| 1913... | 2,989               | 1,501                                   | 847                         | 504                           | 46                           | 6                          | 34                                    | + 50                                       |
| 1914... | 3,359               | 1,480                                   | 840                         | 512                           | 47                           | 6                          | 65                                    | + 409                                      |
| 1915... | 3,166               | 1,500                                   | 861                         | 535                           | 56                           | 6                          | 105                                   | + 102                                      |
| 1916... | 3,041               | 1,892                                   | 943                         | 591                           | 68                           | 7                          | 108                                   | - 569                                      |
| 1917... | 3,902               | 2,489                                   | 1,250                       | 713                           | 110                          | 9                          | 73                                    | - 742                                      |
| 1918... | 6,189               | 3,497                                   | 1,581                       | 829                           | 140                          | 12                         | 34                                    | + 96                                       |
| 1919... | 7,228               | 3,618                                   | 1,813                       | 984                           | 129                          | 13                         | 25                                    | + 646                                      |
| 1920... | 5,882 <sup>g</sup>  | 2,874                                   | 1,974                       | 1,020                         | 98                           | 15                         | 20                                    | - 119                                      |

<sup>a</sup> See Table 3A, Column G.

<sup>b</sup> Sum of items in Table 3B, Column F and Table 3C, Column J.

<sup>c</sup> See Table 3E, Column F.

<sup>d</sup> See Table 3F, Column E.

<sup>e</sup> For description of derivation, see the text.

<sup>f</sup> See Table 3G, Column J.

<sup>g</sup> Rough preliminary figures.

The value of all animal products showed an upward trend throughout the period until 1919. In 1920, however, there was a sharp diminution in the total value, this being mainly occasioned by a fall in the value of meat animals. Because of variations in the value of money, the apparent changes in total values must, of course, not be construed to indicate corresponding changes in the physical output of livestock products.

### § 3d. The Value of Crops Not Fed to Live Stock

In addition to livestock products, farmers and their families consume large quantities of fruits and vegetables, burn fuel from the farm, and sell great amounts of grain and other vegetable products for use by other persons. To calculate the net value of crops thus consumed or sold is not a simple matter. It is first necessary to subtract the amount used for seed. This amount has been calculated by multiplying the normal seed requirements per acre of each crop by the acreage in each year and deducting the resulting amount from the crop of the year previous, since it was from this supply that the farmer reserved his seed.

Estimates of grain fed to livestock have been based upon the 1910 Census and carried forward by aid of the reports in the *Monthly Crop Reporter*<sup>1</sup> showing the quantities in each year not shipped outside the county where grown.

The Census enumerators failed to secure complete reports for farm gardens, hence an estimated item has been added to fill in the omission. In 1910, there were reported 707,763 gardens for which no value of products was assigned. W. C. Funk in *Farmers' Bulletin 635*, published by the Department of Agriculture, shows that the average farm garden produced for home consumption fruit and vegetables worth \$52. If the non-reported gardens produced half as much, or \$26 each, the total would be \$18,624,000 for 1909. This amount has been varied in other years in proportion to the combined value of the reported crops of beans and white and sweet potatoes.

<sup>1</sup> Published by the Bureau of Crop Estimates.

TABLE 3I

AN ESTIMATE OF THE VALUE OF CROPS SOLD OFF THE FARMS OR CONSUMED DIRECTLY BY FARM FAMILIES

| A      | B   | C   | D                  | E   | F   | G   | H   | I   | J   |
|--------|---|---|--------------------|---|---|---|---|---|---|
| Year   | Census estimate of value of all recorded crops (Millions) | Agricultural Department estimate of value of all recorded crops <sup>c</sup> (Millions) | Ratio of B to C    | Probable value of all recorded crops (Millions) C × D | Value of non-recorded gardens <sup>f</sup> (Millions) | Total value of all crops (Millions) E + F | Value of crops fed to live-stock on farms <sup>f</sup> (Millions) | Value of seeds cuttings and plants for next year's crop <sup>f</sup> (Millions) | Net value of all crops consumed on or sold off farms (Millions) G - (H + I) |
| 1909.. | \$ 5,487 <sup>a</sup>                                     | \$ 5,487  | 1.000 <sup>d</sup> | \$ 5,487  | \$19  | \$ 5,506                                  | \$2,601   | \$143   | \$2,762   |
| 1910.. |   | 5,486   | .995 <sup>e</sup>  | 5,461   | 17  | 5,478                                     | 2,645   | 138   | 2,696   |
| 1911.. |   | 5,562   | .991 <sup>e</sup>  | 5,511   | 20  | 5,531                                     | 2,793   | 153   | 2,585   |
| 1912.. |   | 5,842   | .986 <sup>e</sup>  | 5,762   | 18  | 5,780                                     | 2,826   | 139   | 2,816   |
| 1913.. |   | 6,133   | .982 <sup>e</sup>  | 6,020   | 20  | 6,040                                     | 2,924   | 145   | 2,971   |
| 1914.. |   | 6,112   | .977 <sup>e</sup>  | 5,971   | 18  | 5,989                                     | 2,985   | 184   | 2,820   |
| 1915.. |   | 6,907   | .972 <sup>e</sup>  | 6,717   | 20  | 6,737                                     | 3,182   | 207   | 3,347   |
| 1916.. |   | 9,054   | .968 <sup>e</sup>  | 8,763   | 35  | 8,798                                     | 3,926   | 331   | 4,541   |
| 1917.. |   | 13,479  | .963 <sup>e</sup>  | 12,983  | 50  | 13,033                                    | 6,209   | 395   | 6,429   |
| 1918.. |   | 14,094  | .959 <sup>e</sup>  | 13,511  | 47  | 13,558                                    | 5,989   | 450   | 7,119   |
| 1919.. | \$15,295 <sup>b</sup>                                     | 16,035  | .954 <sup>d</sup>  | 15,295  | 52  | 15,347                                    | 6,550   | 434   | 8,362   |
| 1920.. |   | 10,465  | .949 <sup>e</sup>  | 9,935   | 45  | 9,980                                     | 4,604   | 282 <sup>o</sup>  | 5,094   |

<sup>a</sup> Statistical Abstract for 1916, pp. 155-156.

<sup>b</sup> Calculated from data in Press Summary of April 11, 1921, furnished by the Census.

<sup>c</sup> Monthly Crop Reporter for December and Yearbooks of the Department of Agriculture.

<sup>d</sup> Computed by division.

<sup>e</sup> Interpolated along a straight line.

<sup>f</sup> For mode of estimation, see text.

<sup>o</sup> Rough preliminary estimate.

Table 3I indicates that between 1914 and 1919 there was an enormous increase in the book income of agriculturalists from the sale or consumption of crops and that this book income diminished very sharply from 1919 to 1920. These fluctuations were doubtless due far more to price changes than to variations in physical output.

§ 3e. Payments by Agriculture for the Products of Other Industries

In computing the net value product of agriculture, it is, as before explained, necessary to deduct from the gross output amounts paid to other recorded industries for their services. The chief deductions made are those

for the cost of agricultural implements, fertilizers, automobiles used in farm business, harness and saddles, fire insurance, and interest paid to banks. The estimates of these quantities have been recorded in Table 3J.

The value of agricultural implements purchased by farmers has been estimated for the Census years by subtracting from the values of those reported as manufactured the excess values of exports over imports, and multiplying the remainder by 1.20<sup>1</sup> in order to allow for the profits made by retailers. The interpolation for the intercensal years has been based upon an index representing the product of the tons of agricultural implements shipped on the railways (as reported by the Interstate Commerce Commission), and the prices of agricultural implements (as compiled from the records of the United States Department of Agriculture and the International Harvester Company).

That not all of the implements purchased are used up in the year when bought is evidenced by the Census report indicating an increase in the physical supply between 1910 and 1920 amounting to about 41 per cent of all purchases during the decade. The remaining 59 per cent has therefore been assumed to represent the current cost to the industry.

The Census records the amount paid by farmers for fertilizer in the Census years. For the intervening years, the amounts have been estimated on the basis of the figures in the American Fertilizer Handbook, a publication which reports for each year the approximate number of tons of fertilizer used in the United States and also the prices of leading varieties. The average price per ton has been estimated therefrom and multiplied by the tons used in order to obtain an estimate of the total value. This estimate has been corrected by comparing with the amount reported in the Census years and the interpolation has been carried out according to the usual ratio method, using a smooth curve for estimating the ratios in the intercensal years.

It is, of course, impossible to say just what share of the expense of automobiles used on farms should be allowed as a business cost and how much should be charged against pleasure; nevertheless, some rough apportionment must be made. According to the National Automobile Chamber of Commerce,<sup>2</sup> farmers in 1919 operated 32.6 per cent of all cars. These cars are perhaps somewhat smaller than city cars on the average but probably make up at least one-fourth of the automobile value of the country. By combining this figure with others arrived at in the study of the industry of repairing automobiles, one is led to the conclusion that if 40 per cent of total costs be charged to business uses, the figures presented

<sup>1</sup> Ratio based upon a study of the Federal Trade Commission report on the Agricultural Implement Industry.

<sup>2</sup> *Facts and Figures of the Automobile Industry*, 1920, p. 13.

in Table 3J, may represent a rough approximation to the business expense to farmers of the automobiles which they operate.

The amount expended for harness and saddles has been estimated by a rather complex process which presumably gives results not very far from the truth. The gist of the plan is as follows: For the Census years 1909, 1914, and 1919, the quantity of harness and saddlery manufactured is recorded. From this amount in each case the value of exports has been subtracted, there being no imports recorded. It has been assumed that, of the remainder, farmers use the same proportion as *farm* horses and mules constitute of *all* horses and mules. The interpolations for the intercensal years have been made on the basis of an index representing the product of the number of horses and mules on farms and the price of harness to farmers, both figures being taken from the *Monthly Crop Reporter* published by the Agricultural Department. The customary ratio method has been used, the ratio for the intercensal years being interpolated along a smooth curve.

Farmers pay a considerable amount annually for fire insurance and for interest on loans from banks, but there is no information available throwing any definite light on the size of either of these quantities. The assumption has been made that the excess of interest paid to banks over interest received therefrom amounts to 1 per cent of the total crops and animal products sold or consumed. A study of the reports of the Comptroller of the Currency for the smaller banks indicates that it is improbable that the amount is much larger than this, but it may be somewhat smaller.

The cost of fire and tornado insurance has been assumed to be one-tenth of one per cent of the value of all farm buildings. The value of the buildings is given by the Census of 1910 and has been estimated for 1920 on the basis of the preliminary States reports already published. The interpolation has been made along a smooth curve.

An important deduction which is omitted from the list here given is the amount of taxes paid by farmers for services rendered by the various branches of government to their business. This item has been left out because of the impracticability of estimating what part of the service of government benefits the farmer as an entrepreneur and what part contributes to his needs as a consumer. The failure to allow for this expense makes the net value product of agriculture as here stated somewhat larger than the correct figure and also makes the percentage of the value product recorded as being paid to employees slightly smaller than it really is. The error is, however, presumably not large enough to be of very serious moment.

TABLE 3J

## DEDUCTIONS FROM THE GROSS VALUE PRODUCT OF AGRICULTURE ON ACCOUNT OF BUSINESS PAYMENTS MADE TO OTHER INDUSTRIES

(Millions of dollars)

| Calendar year | Total deductions | Value of implements purchased <sup>a</sup> | Value of fertilizers purchased <sup>a</sup> | Expense for business use of automobiles <sup>a</sup> | Value of harness and saddles purchased <sup>a</sup> | Expense of insurance against fire and wind <sup>a</sup> | Interest paid to banks for loans <sup>a</sup> |
|---------------|------------------|--|---|--|---|---|---|
| 1900.....     | \$ 319           | \$ 85                                      | \$115 <sup>b</sup>                          | \$ 6   | \$ 57 <sup>b</sup>                                  | \$ 6  | \$ 50   |
| 1910.....     | 384              | 116  | 135   | 9  | 57  | 6   | 60  |
| 1911.....     | 404              | 103  | 160   | 20   | 59  | 7   | 56  |
| 1912.....     | 405              | 107  | 147   | 32   | 58  | 7   | 54  |
| 1913.....     | 449              | 122  | 161   | 42   | 58  | 7   | 60  |
| 1914.....     | 467              | 93   | 188 <sup>b</sup>                            | 58   | 57 <sup>b</sup>                                     | 7   | 62  |
| 1915.....     | 446              | 90   | 160   | 83   | 64  | 7   | 65  |
| 1916.....     | 551              | 111  | 162   | 116  | 77  | 8   | 76  |
| 1917.....     | 785              | 149  | 222   | 186  | 116   | 8   | 103   |
| 1918.....     | 1,031            | 183  | 294   | 274  | 139   | 8   | 133   |
| 1919.....     | 1,276            | 187  | 329 <sup>b</sup>                            | 417  | 177 <sup>b</sup>                                    | 9   | 156   |
| 1920.....     | 1,300            | 239  | 360 <sup>c</sup>                            | 400 <sup>c</sup>                                     | 177   | 11  | 110   |

<sup>a</sup> For mode of estimating these items, see the text.<sup>b</sup> Derived from the Census.<sup>c</sup> A guess.

The indications from Table 3J are that the combined deductions form a sum which is relatively small as compared to the net value product of this industry.

### § 3f. The Net Value Product of Agriculture

We are now in a position to estimate the total net value product of the industry. In making up this aggregate, it seems necessary to add to the combined value of crops and animal products a small allowance for the improvement in farm lands brought about by the labor of the farmer. This item should be clearly distinguished from the increase in farm values caused by currency inflation or relative increase in urban population. The mode of estimating the additional land value created by the efforts of farmers has been to subtract the farm acreage in 1910 from that in 1920, distribute this amount among the various intervening years, and multiply the estimated acreage increase in each year by the current value of land per acre. This average land value has been calculated from the Census reports and the index of land values found in the Department of Agriculture's *Monthly Crop Reporter*.

Another source of income to farmers which is of considerable importance



is the rental value of farm homes. Some time was devoted to estimating this amount but the ultimate conclusions reached were that the net rent was just about equalled by the expense for materials needed for the construction of all farm buildings and fences. Under these circumstances, it was decided to omit both items from the computation.

Table 3K summarizes the chief factors entering into the net value product of agriculture.

TABLE 3K

AN ESTIMATE OF THE TOTAL NET VALUE PRODUCT OF AGRICULTURE  
IN THE CONTINENTAL UNITED STATES

| A             | B  | C  | D   | E   | F  |
|---------------|--|--|---|---|--|
| Calendar year | Value of animal products <sup>a</sup> (Millions) | Net value of crops consumed or sold off farm <sup>c</sup> (Millions) | Increase in land value due to improvements by farmers <sup>d</sup> (Millions) | Business expenditure for products of other industries <sup>e</sup> (Millions) | Net value product of agriculture (Millions)<br>B + C + D - E |
| 1909.....     | \$2,218  | \$2,762  | \$ 25   | \$ 319  | \$ 4,686   |
| 1910.....     | 3,277  | 2,696  | 139   | 384   | 5,728  |
| 1911.....     | 2,968  | 2,585  | 219   | 404   | 5,368  |
| 1912.....     | 2,585  | 2,816  | 290   | 405   | 5,286  |
| 1913.....     | 2,989  | 2,971  | 376   | 449   | 5,887  |
| 1914.....     | 3,359  | 2,820  | 328   | 467   | 6,040  |
| 1915.....     | 3,166  | 3,347  | 310   | 446   | 6,376  |
| 1916.....     | 3,041  | 4,541  | 218   | 551   | 7,249  |
| 1917.....     | 3,902  | 6,429  | 174   | 785   | 9,720  |
| 1918.....     | 6,189  | 7,119  | 405   | 1,031   | 12,682   |
| 1919.....     | 7,228  | 8,362  | 520   | 1,276   | 14,835   |
| 1920.....     | 5,882 <sup>b</sup>                               | 5,094  | 177   | 1,300 <sup>b</sup>  | 9,853 <sup>b</sup>   |

<sup>a</sup> See Table 3H.

<sup>b</sup> Rough preliminary figures only.

<sup>c</sup> See Table 3I, Column J.

<sup>d</sup> For mode of derivation, see text.

<sup>e</sup> See Table 3J.

The net value product of agriculture evidently increased very rapidly between 1915 and 1919, but suffered a sharp decline in 1920.

### § 3g. The Share of the Employees

It is desirable next to learn what share of this net value product is paid out in the form of wages or salaries (including under these heads, board and lodging furnished to employees), and also the average wage paid per employee. The mode of estimation used is shown in Tables 3L, 3M, and 3N.

TABLE 3L

## AN ESTIMATE OF THE AGGREGATE OF WAGES AND SALARIES PAID BY FARMERS TO EMPLOYEES

| A             | B  | C  | D                  | E   | F  |
|---------------|--|--|--------------------|---|--|
| Calendar year | Wages of farm hands (Census years) (Thousands) | Index of total payments to farm labor <sup>c</sup> (Thousands) | Ratio of B to C    | Estimated total wage of farm hands (Millions) C × D | Estimated total wages paid to employees on farms <sup>f</sup> (Millions) $\frac{11}{10} E$ |
| 1909.....     | \$651,611 <sup>a</sup>                         | 7,918  | 82.29 <sup>d</sup> | \$ 652  | \$ 717   |
| 1910.....     |  | 8,000  | 81.37 <sup>e</sup> | 651   | 716  |
| 1911.....     |  | 8,546  | 80.42 <sup>e</sup> | 687   | 756  |
| 1912.....     |  | 8,710  | 79.47 <sup>e</sup> | 692   | 761  |
| 1913.....     | \$1,363,454 <sup>b</sup>                       | 9,100  | 78.52 <sup>e</sup> | 715   | 786  |
| 1914.....     |  | 8,980  | 77.67 <sup>e</sup> | 697   | 767  |
| 1915.....     |  | 9,330  | 76.62 <sup>e</sup> | 715   | 786  |
| 1916.....     |  | 10,170   | 75.77 <sup>e</sup> | 771   | 848  |
| 1917.....     |  | 12,890   | 74.72 <sup>e</sup> | 963   | 1,059  |
| 1918.....     |  | 15,390   | 73.87 <sup>e</sup> | 1,137   | 1,251  |
| 1919.....     |  | 18,720   | 72.83 <sup>d</sup> | 1,363   | 1,500  |
| 1920.....     |  | 22,000   | 71.97 <sup>e</sup> | 1,583   | 1,742  |

<sup>a</sup> Census of Agriculture, 1910, Vol. V., p. 563. Includes board and lodging.

<sup>b</sup> Preliminary bulletin of the Census, June 29, 1921.

<sup>c</sup> The product of the acreage of leading crops, and the average monthly wage of farm hands without board, as reported by the Bureau of Crop Estimates of the Department of Agriculture.

<sup>d</sup> Computed by division.

<sup>e</sup> Interpolated along a straight line.

<sup>f</sup> Assumed that domestics receive one-tenth the total wages paid farm hands. The allowance here is for only that share of domestic labor required to facilitate the productive work of the farm.

TABLE 3M

## AN ESTIMATE OF THE NUMBER OF EMPLOYEES ON THE FARMS OF THE CONTINENTAL UNITED STATES

| A        | B  | C  | D   | E  | F  | G   |
|----------|--|--|---|--|--|---|
| Year     | Total wages paid to farm hands <sup>a</sup> (Millions) | Estimated average full-time wage for farm hands <sup>d</sup> | Estimated number of full-time hands required (Thousands)<br>$\frac{B}{C}$ | Estimated fraction of workers actually employed <sup>c</sup> | Number of farm hands attached to the industry (Thousands)<br>$\frac{D}{E}$ | Number of employees attached to the industry <sup>e</sup> (Thousands) |
| 1909.... | \$ 652   | \$363  | 1,794   | .881   | 2,037  | 2,376   |
| 1910.... | 651  | 352  | 1,849   | .907   | 2,039  | 2,379   |
| 1911.... | 687  | 367  | 1,873   | .915   | 2,047  | 2,388   |
| 1912.... | 692  | 378  | 1,831   | .894   | 2,048  | 2,390   |
| 1913.... | 715  | 389  | 1,837   | .895   | 2,052  | 2,394   |
| 1914.... | 697  | 386  | 1,809   | .882   | 2,051  | 2,393   |
| 1915.... | 715  | 389  | 1,838   | .900   | 2,042  | 2,382   |
| 1916.... | 771  | 422  | 1,825   | .897   | 2,034  | 2,373   |
| 1917.... | 963  | 526 <sup>b</sup>   | 1,832   | .934   | 1,961  | 2,288   |
| 1918.... | 1,137  | 652  | 1,744   | .959   | 1,818  | 2,121   |
| 1919.... | 1,363  | 767  | 1,778   | .934   | 1,903  | 2,220   |
| 1920.... | 1,583  | 846  | 1,872   | .923   | 2,028  | 2,366   |

<sup>a</sup> See Table 3I, Column E.

<sup>b</sup> A weighted average of summer and winter wages and of wages of different classes of laborers. Data from the 1918 *Annual Report* of the Iowa Bureau of Labor, p. 139, and from the Agricultural Department *Crop Report*, March, 1918, p. 24.

<sup>c</sup> A rough estimate.

<sup>d</sup> Includes value of any food and lodging furnished.

<sup>e</sup> Includes the estimated number of domestic servants required to facilitate the productive work of the farm.

TABLE 3N

AN ESTIMATE OF THE AVERAGE ANNUAL EARNINGS OF FARM EMPLOYEES<sup>a</sup> IN THE CONTINENTAL UNITED STATES AND THEIR SHARE IN THE NET VALUE PRODUCT OF AGRICULTURE

| A        | B   | C   | D  | E   | F   | G  | H  |
|----------|---|---|--|---|---|--|--|
| Year     | Total money wages <sup>b</sup> (Millions) | Number of employees attached to the industry <sup>c</sup> (Thousands) | Average annual earnings per employee $\frac{B}{C}$ | Index of prices of goods consumed by manual and clerical workers <sup>d</sup> | Purchasing power of average annual earnings at prices of 1913 $\frac{D}{E}$ | Net value product of agriculture <sup>e</sup> (Millions) | Per cent of value product paid out in wages and salaries $\frac{B}{G}$ |
| 1909.... | \$ 717                                    | 2,376   | \$302  | .955  | \$316   | \$ 4,686   | 15.3   |
| 1910.... | 716                                       | 2,379   | 301  | .978  | 308   | 5,728  | 12.5   |
| 1911.... | 756                                       | 2,388   | 317  | .984  | 322   | 5,368  | 14.1   |
| 1912.... | 761                                       | 2,390   | 319  | .994  | 321   | 5,286  | 14.4   |
| 1913.... | 786                                       | 2,394   | 328  | 1.000   | 328   | 5,887  | 13.4   |
| 1914.... | 767                                       | 2,393   | 321  | 1.01  | 317   | 6,040  | 12.7   |
| 1915.... | 786                                       | 2,382   | 330  | 1.03  | 320   | 6,376  | 12.3   |
| 1916.... | 848                                       | 2,373   | 357  | 1.10  | 325   | 7,249  | 11.7   |
| 1917.... | 1,059                                     | 2,288   | 463  | 1.29  | 359   | 9,720  | 10.9   |
| 1918.... | 1,251                                     | 2,121   | 590  | 1.58  | 373   | 12,682   | 9.9  |
| 1919.... | 1,500                                     | 2,220   | 675  | 1.773   | 381   | 14,835   | 10.1   |
| 1920.... | 1,742                                     | 2,366   | 736  | 2.165   | 340   | 9,853  | 17.7   |

<sup>a</sup> Includes both farm hands and domestic servants.

<sup>b</sup> See Table 3L, Column F.

<sup>c</sup> See Table 3M, Column G.

<sup>d</sup> Bureau of Labor index carried back by means of a special study.

<sup>e</sup> See Table 3K, Column F.

The preceding tables indicate that the number of employees attached to the industry has increased but slightly during the decade, a conclusion which accords with the almost stationary number of farms shown by the Census. Average wages, when measured in terms of purchasing power, were just a little higher in 1920 than in 1909, though the years 1917 to 1919 were marked by a noticeable increase in the prosperity of the farm laborer. In all years, the wages of farm laborers are much lower than are those of employees in most other lines even when an allowance is made for board and lodging at farm prices, but this differential is doubtless accounted for to some extent by the fact that food and lodging are valued on the farm at rates much cheaper than those which must be paid by city workers for goods or services of equal quality. The fraction of the total net value product paid out in salaries and wages is evidently far lower than in most other industries, due doubtless to the large number of farm operators who

have practically no hired employees. The percentage rose sharply in 1920, the laborers not suffering from the price decline as severely as did the entrepreneurs.

**§ 3h. The Share of the Entrepreneurs and Other Property Owners**

Table 30 shows that the entrepreneurs and other property owners attained unusual prosperity in the years 1917 to 1919 inclusive, but that 1920 was for them materially the worst year in the decade, their income being less than half what it was in the year previous.

**TABLE 30**

**AN ESTIMATE OF THE SHARE OF THE ENTREPRENEURS AND OTHER PROPERTY OWNERS<sup>a</sup> IN THE NET VALUE PRODUCT OF AGRICULTURE**

| A         | B   | C  | D   | E   | F  |
|-----------|---|--|---|---|--|
| Year      | Total net value product <sup>b</sup> (Millions) | Share of employees <sup>c</sup> (Millions) | Share of entrepreneurs and other property owners (Millions) B - C | Index of prices of goods consumed by workers and well-to-do families <sup>d</sup> | Purchasing power of share of entrepreneurs and other property owners at price of 1913 (Millions) $\frac{D}{E}$ |
| 1909..... | \$ 4,686  | \$ 717                                     | \$ 3,969  | .955  | \$4,156  |
| 1910..... | 5,728   | 716  | 5,012   | .978  | 5,124  |
| 1911..... | 5,368   | 756  | 4,612   | .984  | 4,687  |
| 1912..... | 5,286   | 761  | 4,525   | .995  | 4,547  |
| 1913..... | 5,887   | 786  | 5,101   | 1.000   | 5,101  |
| 1914..... | 6,040   | 767  | 5,273   | 1.011   | 5,215  |
| 1915..... | 6,376   | 786  | 5,590   | 1.023   | 5,464  |
| 1916..... | 7,249   | 848  | 6,401   | 1.097   | 5,835  |
| 1917..... | 9,720   | 1,059                                      | 8,661   | 1.280   | 6,766  |
| 1918..... | 12,682  | 1,251                                      | 11,432  | 1.547   | 7,390  |
| 1919..... | 14,835  | 1,500                                      | 13,335  | 1.747   | 7,634  |
| 1920..... | 9,853   | 1,742                                      | 8,111   | 2.124 <sup>e</sup>  | 3,819 <sup>e</sup>   |

<sup>a</sup> Includes owners of rented farms and owners of farm mortgages.

<sup>b</sup> See Table 3K, Column F.

<sup>c</sup> See Table 3L, Column F.

<sup>d</sup> An average of the indices for the working classes and for families spending \$5,000 on consumption goods, the weights used being 3 and 1 respectively.

<sup>e</sup> Rough preliminary estimate.

**§ 3i. The Physical Output of Agricultural Produce**

It is also of interest to see whether the output of the industry is increasing or diminishing. This point is covered by the figures in Table 3P.

TABLE 3P

AN ESTIMATE OF THE VALUE AT PRICES OF 1913 OF ALL PRODUCTS CONSUMED BY FARMERS OR SOLD OFF THE FARMS OF THE CONTINENTAL UNITED STATES

| Year   | Crops   |                                 |  | Animals and animal products                             |  |  | All products                             |
|--------|---|---------------------------------|--|---|--|--|--|
|        | Value at prices of December 1st <sup>a</sup> (Millions) | Index of prices at December 1st | Value at prices of December 1st, 1913 (Millions)<br>B<br>C | Value at average prices of year <sup>b</sup> (Millions) | Index of average prices of year <sup>c</sup> | Value at average prices of 1913 (Millions) | Value at 1913 prices (Millions)<br>D + G |
|        |   |                                 |  |   |  | E<br>F                                     |  |
| 1909.. | \$2,762   | .957 <sup>d</sup>               | \$2,886  | \$2,218   | .891   | \$2,489                                    |  |
| 1910.. | 2,696   | .887 <sup>d</sup>               | 3,039  | 3,277   | .987   | 3,320                                      | \$5,375                                  |
| 1911.. | 2,585   | .997 <sup>c</sup>               | 2,593  | 2,968   | .850   | 3,492                                      | 6,359                                    |
| 1912.. | 2,816   | .879 <sup>c</sup>               | 3,204  | 2,585   | .925   | 2,795                                      | 6,085                                    |
| 1913.. | 2,971   | 1.000 <sup>c</sup>              | 2,971  | 2,989   | 1.000  | 2,389                                      | 5,999                                    |
| 1914.. | 2,820   | .883 <sup>c</sup>               | 3,194  | 3,359   | 1.022  | 3,287                                      | 5,960                                    |
| 1915.. | 3,347   | .969 <sup>c</sup>               | 3,454  | 3,166   | .963   | 3,287                                      | 6,481                                    |
| 1916.. | 4,541   | 1.610 <sup>c</sup>              | 2,821  | 3,041   | 1.098  | 2,769                                      | 6,741                                    |
| 1917.. | 6,429   | 2.050 <sup>c</sup>              | 3,136  | 3,902   | 1.557  | 2,506                                      | 5,590                                    |
| 1918.. | 7,119   | 2.101 <sup>c</sup>              | 3,389  | 6,189   | 1.851  | 3,344                                      | 5,642                                    |
| 1919.. | 8,362   | 2.436 <sup>c</sup>              | 3,433  | 7,228   | 1.962  | 3,684                                      | 6,733                                    |
| 1920.. | 5,094   | 1.401 <sup>c</sup>              | 3,636  | 5,882 <sup>f</sup>                                      | 1.833  | 3,209                                      | 7,117                                    |
|        |   |                                 |  |   |  |  | 6,845                                    |

<sup>a</sup> See Table 3I.

<sup>b</sup> See Table 3H.

<sup>c</sup> Computed from table in *Monthly Crop Reporter*, Dec. 1920, p. 150, weighting crops in proportion to importance of sales or home consumption.

<sup>d</sup> Estimated on basis of index of all crops. See *Yearbook of Department of Agriculture*, 1918, p. 701.

<sup>e</sup> Average of prices of meat animals, poultry, eggs, and dairy products weighted in proportion to the sales of each in 1919. Data from *Monthly Crop Reporter*.

<sup>f</sup> Rough estimate only.

Table 3P makes it clear that the physical volume of agricultural products has tended to increase slowly during the decade, 1919 being the banner year.

It is however, of greater interest to learn whether the output per person engaged in agriculture is increasing or diminishing and also whether the output is or is not keeping pace with the growth of population in the United States. The facts in this connection are shown in Table 3Q.

TABLE 3Q

AN ESTIMATE FOR THE CONTINENTAL UNITED STATES OF THE OUTPUT OF AGRICULTURAL PRODUCTS PER INHABITANT AND PER PERSON ENGAGED IN AGRICULTURE

| Year    | Thousands of Persons Engaged in Agriculture |                             |       | Estimated Population of United States, <sup>e</sup> June 30 (Millions) | Value of Output at Prices of 1913 |   |   |
|---------|---|-----------------------------|-------|--|-----------------------------------|---|---|
|         | Farmers                                     | Em-<br>ployees <sup>d</sup> | Total |  | Total / (Millions)                | Per person engaged in agriculture F ÷ D | Per inhabitant of the United States F ÷ E |
|         |   |                             |       |  |                                   |   |   |
| 1909... | 6,330 <sup>c</sup>                          | 2,376                       | 8,706 | 90.4   | \$5,375                           | \$617                                   | \$59                                      |
| 1910... | 6,362 <sup>a</sup>                          | 2,379                       | 8,741 | 92.2   | 6,359                             | 727                                     | 69  |
| 1911... | 6,376 <sup>c</sup>                          | 2,388                       | 8,764 | 93.8   | 6,084                             | 694                                     | 65  |
| 1912... | 6,388 <sup>c</sup>                          | 2,390                       | 8,778 | 95.3   | 5,999                             | 683                                     | 63  |
| 1913... | 6,400 <sup>c</sup>                          | 2,394                       | 8,794 | 97.3   | 5,960                             | 678                                     | 61  |
| 1914... | 6,410 <sup>c</sup>                          | 2,393                       | 8,803 | 99.2   | 6,481                             | 736                                     | 65  |
| 1915... | 6,418 <sup>c</sup>                          | 2,382                       | 8,800 | 100.4  | 6,741                             | 766                                     | 67  |
| 1916... | 6,425 <sup>c</sup>                          | 2,373                       | 8,798 | 101.7  | 5,590                             | 635                                     | 55  |
| 1917... | 6,432 <sup>c</sup>                          | 2,288                       | 8,720 | 103.1  | 5,642                             | 647                                     | 55  |
| 1918... | 6,438 <sup>c</sup>                          | 2,121                       | 8,559 | 104.2  | 6,733                             | 786                                     | 65  |
| 1919... | 6,443 <sup>c</sup>                          | 2,220                       | 8,663 | 104.8  | 7,117                             | 821                                     | 68  |
| 1920... | 6,448 <sup>b</sup>                          | 2,366                       | 8,814 | 106.6  | 6,845 <sup>g</sup>                | 777                                     | 64  |

<sup>a</sup> Abstract of Census of U. S. 1910, p. 265. Number of farms is identical with number of farmers.

<sup>b</sup> Press bulletin of Bureau of Census, June 22, 1921.

<sup>c</sup> Interpolated along a smooth curve.

<sup>d</sup> See Table 3M, Column G.

<sup>e</sup> Interpolated between Census estimates by means of a special study elsewhere recorded.

<sup>f</sup> See Table 3P, Column H.

<sup>g</sup> Rough estimate only.

The figures in Column G show that the gross value of the output per person engaged in agriculture is about the same as the average annual earnings of factory or railway employees. From this gross output, however, the agriculturalist must subtract payments for interest, insurance, fertilizers, machinery, etc., before arriving at his net income and this net income includes not only payment for his services but also for the use of any property which he may possess and for any farm work performed by his wife or children. It seems clear then that when farm laborers and farmers are considered as a joint group, their economic condition, if measured in monetary terms, compares unfavorably with that of the employees of railways or of manufacturing concerns.

The last column of the table shows that gross agricultural output is just

about keeping pace with the population of the nation, no marked trend being discernible.

### § 3j. The Relative Position of Agriculture Among the Industries

The final question to be considered is: "Is agriculture playing an increasing or diminishing rôle in the industry of the country?" This query is answered by Table 3R which shows that the proportion of the total value product of all industries produced by agriculture remained nearly constant until 1917 and then rose very sharply. The probabilities are, however, that the percentage will fall very materially in 1920.

TABLE 3R

THE PER CENT OF THE NET VALUE PRODUCT OF ALL INDUSTRIES IN THE CONTINENTAL UNITED STATES PRODUCED BY AGRICULTURE

| Year      | Total net value product of all industries <sup>c</sup><br>(Millions) | Net value product of agriculture <sup>b</sup><br>(Millions) | Per cent of the net value product originating in agriculture |
|-----------|--|---|--|
| 1909..... | \$28,775   | \$ 4,686  | 16.3   |
| 1910..... | 31,766   | 5,728   | 18.0   |
| 1911..... | 31,188   | 5,368   | 17.2   |
| 1912..... | 33,554   | 5,286   | 15.8   |
| 1913..... | 35,580   | 5,887   | 16.5   |
| 1914..... | 33,936   | 6,040   | 17.8   |
| 1915..... | 36,109   | 6,376   | 17.7   |
| 1916..... | 45,418   | 7,249   | 16.0   |
| 1917..... | 53,860   | 9,720   | 18.0   |
| 1918..... | 60,366   | 12,682  | 21.0   |
| 1919..... | 65,000 <sup>a</sup>  | 14,835  | 22.8 <sup>a</sup>  |
| 1920..... |  | 9,853 <sup>a</sup>  |  |

<sup>a</sup> Rough preliminary estimate only.

<sup>b</sup> See Table 3K, Column F.

<sup>c</sup> Summary compiled from the reports of the separate industries.

### § 3k. Returns for the Efforts of Farm Operators

It is a fact worthy of comment that while about thirty per cent of the gainfully employed persons in the United States are engaged in agriculture, the industry normally receives only about seventeen per cent of the national income. In a preceding paragraph, attention has been called to the relatively small average income received by farmers and agricultural laborers when considered as a single class. Column D of Table 3N makes it clear, however, that agricultural laborers receive low wages. Do farm operators secure high returns for their physical and mental effort and managerial skill? Table 3S has been constructed with a view to answering that query.



TABLE 3S

AN ESTIMATE OF THE REWARDS FOR MANAGEMENT AND LABOR RECEIVED BY THE FARMERS OF THE CONTINENTAL UNITED STATES

| A    | B   | C                                   | D   | E  | F   | G  | H                                       | I   | J   |
|------|---|-------------------------------------|---|--|---|--|---|---|---|
| Year | Total value of farm property including cash used as working capital <sup>g</sup> (Millions) | Assumed interest rate on investment | Rewards ascribable to property (Millions) B × C | Total returns to entrepreneurs and other property owners <sup>d</sup> (Millions) | Reward for farmer's management and labor (Millions) E - D | Number of farmers <sup>e</sup> (Thousands) | Average reward per farmer $\frac{F}{G}$ | Index of prices of goods consumed by farmers <sup>f</sup> | Average reward per farmer at prices of 1913 $\frac{H}{I}$ |
| 1909 | \$40,059 <sup>c</sup>   | .05                                 | \$2,003   | \$3,969  | \$1,966   | 6,330                                      | \$ 311                                  | .955  | \$326   |
| 1910 | 41,400 <sup>a</sup>   | .05                                 | 2,070   | 5,012  | 2,942   | 6,362                                      | 462                                     | .978  | 472   |
| 1911 | 42,225 <sup>c</sup>   | .05                                 | 2,111   | 4,612  | 2,501   | 6,376                                      | 392                                     | .984  | 398   |
| 1912 | 42,917 <sup>c</sup>   | .05                                 | 2,146   | 4,525  | 2,379   | 6,388                                      | 372                                     | .995  | 374   |
| 1913 | 45,227 <sup>c</sup>   | .05                                 | 2,261   | 5,101  | 2,840   | 6,400                                      | 444                                     | 1.000   | 444   |
| 1914 | 46,619 <sup>c</sup>   | .05                                 | 2,331   | 5,273  | 2,942   | 6,410                                      | 459                                     | 1.011   | 454   |
| 1915 | 48,199 <sup>c</sup>   | .05                                 | 2,410   | 5,590  | 3,180   | 6,418                                      | 495                                     | 1.023   | 484   |
| 1916 | 52,687 <sup>c</sup>   | .05                                 | 2,634   | 6,401  | 3,767   | 6,425                                      | 586                                     | 1.097   | 534   |
| 1917 | 57,110 <sup>c</sup>   | .05                                 | 2,855   | 8,660  | 5,805   | 6,432                                      | 903                                     | 1.280   | 705   |
| 1918 | 64,122 <sup>c</sup>   | .05                                 | 3,206   | 11,432   | 8,226   | 6,438                                      | 1,278                                   | 1.547   | 826   |
| 1919 | 71,848 <sup>c</sup>   | .055                                | 3,951   | 13,335   | 9,384   | 6,443                                      | 1,456                                   | 1.747   | 833   |
| 1920 | 78,707 <sup>b</sup>   | .065                                | 5,116   | 8,111  | 2,995   | 6,448                                      | 465                                     | 2.124   | 219   |

<sup>a</sup> Abstract of the Census of 1910, p. 265.

<sup>b</sup> Preliminary Census bulletins for 1920.

<sup>c</sup> Interpolated

<sup>d</sup> See Table 3-O, Column D.

<sup>e</sup> See Table 3-Q, Column B.

<sup>f</sup> See Table 3-O, Column E.

<sup>g</sup> 1.01 times the value of farm property as shown by the Census—the one per cent allowance being an estimate for the cash and bank deposits held by farmers as working capital.

Since we do not know what percentage<sup>1</sup> of all farms are owned by active farmers, it is impossible to ascertain either the total or average income of this class. It is, however, feasible by aid of the material at hand, to make a crude estimate of the amount received by the farmers of the country, as a reward for their physical and managerial labor. Such an estimate involves the assumption that a percentage return should be allowed on the investment before calculating the payment for the services of the farmer. This assumption is open to some criticism, but, since it is often entirely practicable for the farmer to sell all of his property and invest it in securities, there seems to be nothing unreasonable in using it as a hypothesis. It should, however, be kept firmly in mind that the amounts entered in

<sup>1</sup> The fact that many rented farms are owned by men who operate other farms, prevents the computation of this percentage.

Column J are not the average incomes of the farmers but only the amounts which they could count as pay for their physical and managerial services. Individual farmers who were property owners, may well have made or lost several times the recorded sum because of a rise or fall in land values during the year and that part of their income assigned to the interest allowance on the current value of their property may have been far larger than the remainder ascribed to managerial or physical effort or to other profits. Column B shows a gain of 15 billions in the value of farm property from 1919 to 1920, and, while most of this nominal gain was doubtless merely a reflection of the rise in the general price level, yet, in some sections, farm lands probably rose in value even faster than commodities in general. Were the speculative gains in such instances added to the \$219 recorded in Column J, the average gain for farm owners in 1920 would doubtless compare much more favorably with other years in the decade. In connection with the latter point it should also be noted that the extremely low calculated reward for the farmer's labor and management in 1920 was occasioned to a considerable extent by the heavy property charge resulting from the unusually high land values and high interest rates current at that time.

The indications from Table 3S are then that farmers, even though they are entrepreneurs, and belong to the class usually considered to consist of men of higher talents than mere employees, nevertheless obtain on the average less money value in return for their efforts than do the average employees in most lines of industry. Only in the years 1918 and 1919 did they receive more than the average earnings for all employees in the United States, while in 1920 their rewards fell to a mere fraction of the average wage in other lines. Even though the same money will buy considerably more of certain commodities in the country than in the city, it nevertheless appears that the average farmer can scarcely with justice be considered a pampered child of fortune.