

# The Secular Movement of Corn Prices

By GEOFFREY S. SHEPHERD

AGRICULTURAL EXPERIMENT STATION  
IOWA STATE COLLEGE OF AGRICULTURE  
AND MECHANIC ARTS

C. F. CURTISS, Director

AGRICULTURAL ECONOMICS SECTION



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Errata: p. 193, table I, under "Consumption of corn in bushels per head," read 3.7 instead of .37 in column headed "Human."

p. 222, appendix IX, in column headed "J," read (1x3.7) instead of (1x0.37).

p. 223, appendix IX, in column headed "J," read (1x3.7) instead of (1x0.37).

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## SUMMARY

### PERIOD 1866 TO 1919

The price of corn declined after the Civil War from 50 cents a bushel at the farm in 1866 to 34 cents in 1896. After that date the direction of the trend changed; it turned upward, rising more rapidly than it had previously fallen. By the outbreak of the recent World War, the price had risen to 65 cents a bushel.

During the inflation period of the World War, the price of corn rose as high as \$1.40 a bushel at the farm. Since the war, the price has fallen to about 75 cents.

If these prices are reduced to purchasing power, the movements are considerably reduced. The decline from 1866 to 1896 disappears entirely, leaving only a steady and gradual rise from 1866 to 1919. During this period the production of corn kept pace with the increasing population of livestock consuming corn. The rise in the purchasing power of corn was due mainly to the increasing purchasing power of the livestock to which the corn was fed. This, in turn, resulted from the fact that from 1866 to 1919 the demand for meat increased faster than the supply of it.

### DEVELOPMENTS SINCE THE WAR

Since the war, the trend of the purchasing power of corn has fallen about 25 percent.

This lower purchasing power is not due to any increase in corn production, for production has fallen off about 5 percent. It is due to a decrease in the demand for corn and an increase in the supply of it.

In the first place, the number of horses and mules has fallen off 30 percent since the war. Cattle numbers have been reduced. The numbers of hogs on farms have also decreased, altho the numbers of hogs slaughtered have not.

In the second place, the purchasing power of hogs and beef cattle has fallen about 25 percent. This has reduced the demand for corn per head of livestock. Changes in livestock production practices have also had a similar tho less important effect in reducing the demand per head.

Finally, improvements in corn production methods and the northwestward movement of the Corn Belt have increased the supply of corn.

### PROSPECTS FOR THE FUTURE

The price of corn will be affected in the future as in the past by the movements of the general price level. The future course of this general price level is uncertain. The outlook for the purchasing power rather than the price of corn will therefore be considered.

First as to the prospective demand for corn. The number of horses and mules may be expected to continue to decrease. The trend of cattle numbers will probably be horizontal. Hog slaughter is likely to increase slowly, altho the numbers of hogs on farms are declining. The total hog demand for corn will probably continue at about its present level.

The supply of corn is likely to continue to increase, due to continued improvement in corn production methods, the northwestward spread of the Corn Belt and perhaps to decreased competition from the smaller grains.

The trend of the purchasing power of corn, therefore, is likely to move slowly downward in the future. Those who are in a position to continue to cut the cost of producing corn should be able to preserve their profits—in some cases to increase them—but those on small, rough farms may not.

## APPENDIX I

In this bulletin mathematically fitted curves are used wherever advisable and free-hand curves wherever possible.

Free-hand curves are open to one or two serious objections. They are unscientific in that where they are used the work cannot be repeated with accuracy by others; no two investigators will draw in curves alike; and one is always open to the accusation, from himself if not from others, that he bent the curve a little here and there to make the work bear out whatever preconceptions he may have had, while others with different ideas might inflect the curve differently so that the work in their hands would lead to different conclusions.

The use of mathematically fitted curves is admittedly open to some of these objections also; one may reach certain conclusions, partly because he chose a certain type of curve, as easily as because he drew in a free-hand curve where he wanted it to go. But such liberties can be taken with mathematical curves only by breaking a straight line into many short sections, or by using a curved line the equation to which becomes very complicated, involving an almost prohibitive amount of labor; in either case the attempt stands convicted by its own objective characteristics.

In the case of this corn prices series, the secular movement before the war abruptly changes its direction in 1896 from downward to upward. It appears that a straight line broken at 1896 and discontinued at the war period would fit the data reasonably well. The post-war period is too short to be well represented by a trend line, but one is inserted for what it is worth.

The equations to these three consecutive trend lines, all of the type  $y = a + bx$ , are as follows:

1. 1866 to 1896, inclusive,  $y = 41.19 - .5611X$   
with origin at 1881
2. 1896 to 1915, inclusive,  $y = 46.29 + 1.97X$   
with origin halfway between  
1905 and 1906
3. 1922 to 1928, inclusive,  $y = 73.79 - .1429X$   
with origin at 1925

The corn production data are given in table 1 of U. S. D. A. Statistical Bulletin No. 28. The data from 1866 to 1888 have been revised slightly by Dr. O. C. Stine, in charge, Division of Statistical and Historical Research, B. A. E., U. S. D. A. As Dr. Stine stated in a letter to the author under date of April 30, 1929, "These revisions are merely mathematical adjustments to bring the figures at the end of a decade in line with the census figures. The revisions are made by distributing the difference between the estimate and the census figure back thru the previous 10 years, on the assumption of accumulative error. Acreage only was revised in this manner, the production revision being merely the revised acreage times the reported yield." These revisions "have never been published except as charted in the yearbook of 1921." They are shown in table 1 which came direct from Dr. Stine.

The equation for the unbroken trend line in fig. 2, the Secular Movements of the Purchasing Power of Corn, is:

$$y = 49.03 + .53x$$

With origin halfway between 1893 and 1894.

The trend line fitted to corn production in fig. 10 is a cubic parabola. The equation to it is:

$$y = 2383.81 + 1.9956x - .4281x^2 - .012369x^3$$

with origin at 1897

The trend lines in the rest of the charts were drawn in free-hand.

TABLE III. UNITED STATES: CORN PRODUCTION, REVISED FIGURES  
1866-1888

Year	Production (1,000 bushels)
1866	788,877
1867	684,896
1868	798,720
1869	760,935
1870	938,173
1871	1,022,487
1872	1,145,390
1873	991,960
1874	917,838
1875	1,452,550
1876	1,434,083
1877	1,526,653
1878	1,602,298
1879	1,821,175
1880	1,705,238
1881	1,174,962
1882	1,574,400
1883	1,499,812
1884	1,723,363
1885	1,842,396
1886	1,570,272
1887	1,360,991
1888	1,846,549

## APPENDIX II

A later study shows that the relationship between fluctuations in the size of the corn crop and in farm purchasing power December 1 for the period 1886-1905 is 1 to 1.5. That is, a crop 10 percent larger than average results in a purchasing power 15 percent lower than average.

The influence of the large crops from 1895 to 1900, inclusive, can be removed according to the method shown in the following table. Columns A and B are taken directly from the original corn production and purchasing power series expressed as percentage fluctuations about their trend value.

TABLE IV

Year	A Production in percent of trend	B 1.5xA	C Purchasing power in percent of trend	C and B	D C and B + 100	E Trend value	DxE 100 Pur- chasing power cor- rected for size of crop
1895	+ 5.8	+ 8.7	-28.4	-19.7	80.3	49.83	40.01
1896	+27.3	+40.95	-36.7	+ 4.25	104.25	50.36	52.50
1897	+ 9.8	+14.7	-23.6	- 8.9	91.1	50.89	46.36
1898	+ 4.6	+ 6.9	-20.7	-13.8	86.2	51.42	44.32
1899	+ 9.8	+14.7	-23.2	- 8.5	91.5	51.95	47.53
1900	+ 8.5	+12.75	-16.9	- 4.15	95.85	52.48	50.30

The equations to the two straight lines fitted to the data thus corrected are:  
 Period 1866-1896,  $y$  equals  $42.8 + .477x$ , origin at 1881.  
 Period 1896-1915,  $y$  equals  $54.6 + .88x$ , origin halfway between 1905-1906.



## APPENDIX III

The question may be asked whether there is any difference between the effect of a vertical and horizontal shift in demand upon the market price for a good.

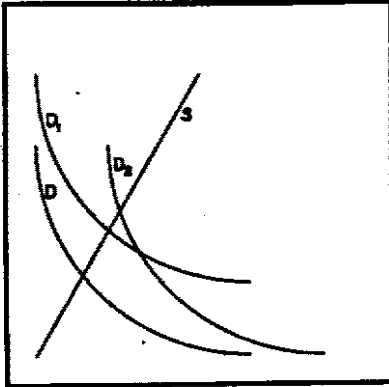


Fig. 12. Effect of vertical and horizontal shifts in the demand curve.

There is. This is shown most clearly if a strongly curved demand curve is considered, as in the chart (fig. 12). The original position of the demand curve is shown at  $D$ ; the location of the curve after a 10 percent vertical rise is shown at  $D_1$ , and after a 10 percent horizontal move to the right, at  $D_2$ . The difference between  $D_1$  and  $D_2$  is considerable.

It appears that with conditions of inelastic supply, a shift in demand to the right will result in a higher price than an equal shift in demand upward. The intersection point of the supply curve  $S$  and the demand curve  $D_1$  is higher than the intersection point with the demand curve  $D_2$ . This situation would be reversed if an elastic supply curve were used.

Apparently, a horizontal shift in demand has the same effect on price as an equal vertical shift only if the supply curve cuts the intersection of  $D_2$  and  $D_1$ ; that is, if its slope is such that  $\Delta y$  divided by  $\Delta x$  equals 1.

The main reason, however, for distinguishing between vertical and horizontal shifts in the demand curve is the usefulness of the distinction as a conceptual tool in rational analysis.

## APPENDIX IV

## LIVESTOCK NOT ON FARMS

It is shown in the text that annual data on the numbers of livestock not on farms are not available. The figures given in the decennial census reports must therefore be used, and even they run back no farther than 1900.

Almost the only thing that can be done with this item is first to decide on *a priori* grounds whether the numbers of livestock not on farms bore a fairly constant relation to the numbers on farms before 1900. If they did, the next thing is to work out what that relation (proportion) has been since 1900, and then to correct the annual data showing the numbers on farms accordingly. The correction formula, if the original datum is called  $y$ , and the proportion is designated  $x$ ,

$$\text{is } \bar{y} = y \frac{x + 100}{100}.$$

Data for 1930 are not yet compiled, but it is safe to assume that the proportion between horses and mules not on farms and those on farms has very heavily declined since 1920 due to the advent of the motor truck and automobile in the cities. This decline was already in progress before 1920, as the reduction in numbers from 1910 to 1920 shown in table V reveals. Probably, however, the proportion remained

fairly constant before 1900 since it changed little between 1900 and 1910.

The proportion between the number of hogs not on farms and those on farms fluctuated rather widely between 1900 and 1920, as table V shows; but that was probably due to the movements of the hog production cycle. The cattle proportion apparently rises steadily from 1900 to 1920. There is no way of telling, however, whether or not this is a continuation of a rise before 1900.

The whole situation is very unsatisfactory. The only redeeming features are that the proportions for hogs and cattle, which fluctuate considerably, are small (about 3 percent), so that the effect of the fluctuations is not great; while the proportion for horses and mules, which is rather high (running over 14 percent), does not fluctuate much.

The procedure that will be followed in compiling the index of demand from all livestock (on farms and not on farms) will be to multiply the annual livestock-on-farms data from 1866 to 1920 by the average

TABLE V. RELATION BETWEEN LIVESTOCK NOT ON FARMS AND LIVESTOCK ON FARMS  
A. Not On Farms

	1900	1910	1920
Cattle	1,616,422	1,878,782	2,111,527
Horses and Mules	3,110,789	3,453,160	2,083,861
Swine	1,818,114	1,287,960	2,638,389
B. On Farms			
	1900	1910	1920
Cattle	67,719,410	61,803,866	66,652,559
Horses and Mules	21,531,635	24,042,882	25,199,552
A x 100 <sup>1</sup>			
B			Average proportion
			1900-1920
			(1900-1910 for horses)
	1900	1910	1920
Cattle	2.4	3.0	3.2
Horses and Mules	14.5	14.4	
Swine	2.9	2.2	4.4

<sup>1</sup>A is the numbers not on farms; B is the numbers on farms. The figures in this column show the percentage that A is of B.

Sources of data for livestock on farms:

1920 Census Report

Swine table 60, page 598

Cattle, table 37, page 572

Horses and mules, table 21 and 22, pages 547-548

Sources of data for livestock not on farms for 1900:

1910 Census Report

Swine, table 69, page 447

Cattle, table 65, page 430

Horses and Mules, table 67, page 437

Sources of data for livestock not on farms, 1910-1920:

1920 Census Report

Swine; for years 1910 and 1920, table 76, page 617

Cattle; for years 1910 and 1920, table 75, page 615

Horses and Mules; 1910 and 1920, table 74, page 615

proportion existing between it and the figures for livestock not on farms for the period 1900 to 1920 (for horses and mules, however, the average 1900 to 1910 will be used because of the marked decline in their proportion after 1910) plus 100, and dividing them by 100.

This computation, and the index figures obtained are shown in Appendix IX.

## APPENDIX V

### INCREASE IN CORN EXPORT DEMAND

If the purchasing power of corn had remained constant from 1866 to 1919, an increase in exports would accurately reflect an increase in export demand. The gradual decline in exports since 1877 (except for the period of big crops and business depression in the late '90's) shown in fig. 13, would then be evidence of a gradual decline in export demand.

The purchasing power of corn, however, did not remain constant; it rose gradually from beginning to end of the period, as earlier sections have shown. From 1877 to 1918, the trend of corn purchasing power rose from 40 to 62 cents.

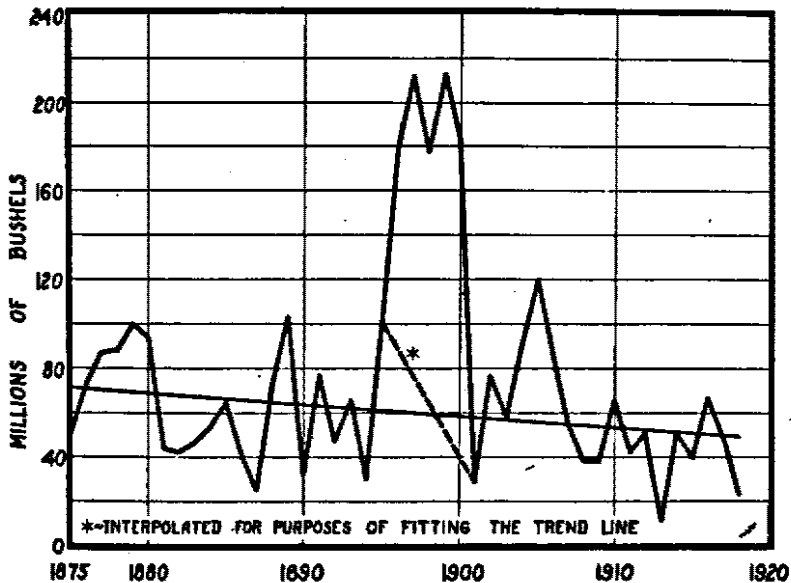


Fig. 13. United States domestic exports of corn.

At the same time, as fig. 13 shows, the trend of exports declined from 70 million bushels to 50 million. Was this decline simply the result of the rise in the purchasing power of corn, the position of the export demand curve remaining unchanged, or does it represent a decline in the export demand for corn in the full schedule sense?

Figure 14 throws light on the answer. It shows the relation between annual fluctuations in corn purchasing power and exports.

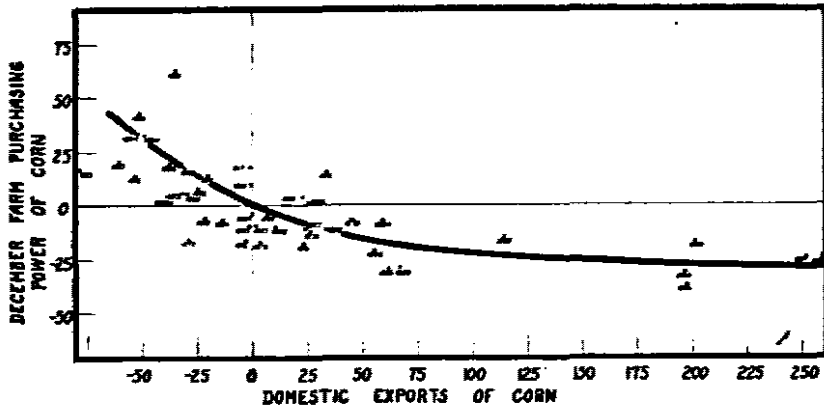


Fig. 14. Exports-and-purchasing-power curve for corn.

The free-hand curve drawn thru the dots indicate that the export demand is very elastic at the lower end but only moderately so in its upper ranges.

It has been previously stated that from 1877 to 1918 the trend of corn purchasing power rose from 40 to 62 cents. This is a percentage (of the mean of 40 and 62) rise of 43.

If the corn exports and purchasing power curve had remained unchanged during this period, reference to fig. 14 shows that this 43 percent increase in the purchasing power of corn would have cut exports down two-thirds.

Actually, exports were cut only one-third, from 70 million bushels in 1877 to 50 million in 1918. The export demand for corn then must have increased 20 or 25 million bushels from 1877 to 1918.

This is only a rough approximation, because the exports-and-purchasing-power curve based on long-time movements does not necessarily, or even probably, have the same slope as one based on annual fluctuations.

On the one hand, the exports-and-purchasing-power curve based on annual fluctuations might be expected to be more elastic than the exports-and-purchasing-power curve based on long-time changes. The surplus from an occasional bumper crop of corn would be readily taken up by European buyers who could expect to sell it at higher and more normal prices within the next year or two after they had purchased it. A persistent export surplus of corn, however, would not be so readily absorbed. It would have to be sold each year as purchased.

On the other hand, it must be remembered that in general the longer the time on which the individual exports-and-purchasing-power curve data are based, the more elastic is the curve likely to be. Buyers have more time then to adjust the uses to which their purchases are put, so as to take large quantities more easily, i.e., at higher prices.

The period of bumper crops and low prices from 1895 to 1900, inclusive, seems to support the latter view rather than the former. During that period of six successive large crops and low prices, the export takings continued to be very great; the export curve remained very elastic right up to the end of the five years.

The assumption is apparently justified, then, that the long-time exports-and-purchasing-power curve should be fully as elastic as the exports-and-purchasing-power curve based on annual fluctuations.

## APPENDIX VI

The rise in the purchasing power of hogs cannot be taken as a direct measure of the vertical rise in the position of the demand curve for corn.

Simply because an increase has taken place in the price of a good, it does not follow that there has been an equal vertical rise in the position of the demand curve for it. Whether a shift in the location of a demand curve, either upwards or to the right, will result in an increase in the price or in the quantity taken, or both, depends upon the conditions of supply, that is, upon the slope of the supply curve.

If in this case the number of bushels of corn fed per hog remained substantially unchanged over this whole period and the total numbers of livestock also kept pace with the growth of total corn production, the conclusion would be that the vertical rise in the position of the demand curve was roughly as great as the rise in the marginal cost of production for the larger quantity of corn being produced.

If, however, the number of bushels fed per hog increased, then the vertical rise in the location of the hog-demand curve for corn must have been greater than the rise in the marginal costs of producing the larger production of corn.

This second situation appears to be what actually happened; because, as pointed out in a later section, the consumption of corn per head increased to some extent in the later part of the period.

The conclusion is, then, that a somewhat greater vertical rise took place in the demand curve for corn than is indicated by the increase in the purchasing power of hogs thruout this period.

## APPENDIX VII

The changes in the small items have been slight.

The first item is the exports. In the period just before the war they amounted to 1.5 percent of the total crop. After the war they fell off: the simple average of the exports from the United States for the last four years, 1923-1927 inclusive, is 0.7 percent of the total crop. The reduction in exports therefore accounts for only 0.8 percent of the total production of corn.<sup>2</sup>

The amounts taken by merchant mills have decreased. The data are shown in table VI.

TABLE VI.<sup>3</sup> CORN: QUANTITY MILLED IN THE UNITED STATES, CENSUS YEARS 1914-1927 (IN MILLIONS OF BUSHELS)

	1909	1914	1919	1921	1923	1925	1927*
United States	209.3	180.1	113.8	122.2	125.2	105.3	92.7

Compiled from reports of the Census of Manufactures.

\*Preliminary report.

<sup>3</sup>Tables VI, VII and VIII are taken from pp. 80 and 81 of U. S. D. A. Statistical Bulletin No. 28, "Corn Statistics," 1928, prepared by the Bureau of Agricultural Economics, Washington, D. C.

<sup>2</sup>It could at the most have accounted for only 1.5 percent of the total production of corn, since this is all that was exported on the average just before the war. Yet it must be remembered that actually the reduction in the export demand must have been very great. Otherwise the 25 percent reduction in the purchasing power of corn after the war would have resulted in greatly increased exports, instead of the slight decrease that actually occurred; for fig. 14 in Appendix V shows that the export demand for corn is elastic, especially in the lower part of the curve. See also the discussion in Appendix V.

The table shows that since 1920 there has been a reduction of about 30 million bushels in the amount of corn taken by merchant mills. Other industrial uses take only small amounts of corn. The changes in these items are negligible, as tables VII and VIII show.

TABLE VII. CORN: QUANTITY USED FOR THE PRODUCTION OF ALCOHOL AND OTHER DISTILLED SPIRITS  
1901-1928  
(000 omitted)

Year ended June 30	Corn used	Year ended June 30	Corn used
1915	14,260	1922	3,093
1916	32,070	1923	3,106
1917	33,973	1924	4,835
1918	14,545	1925	7,201
1919	3,890	1926	7,948
1920	2,652	1927	8,383
1921	4,811	1928	6,189

Compiled from reports of the Bureau of Internal Revenue.

TABLE VIII. CORN: GRINDINGS, IN THE MANUFACTURE OF CORNSTARCH GLUCOSE, ETC. 1920-1928  
(000 omitted)

1920	48,429
1921	66,852
1922	68,190
1923	71,545
1924	70,857
1925	74,688
1926	78,323
1927	92,119
1928	

Compiled from monthly reports of the Survey of Current Business, United States Department of Commerce. Grindings of corn by the wet process in the manufacture of cornstarch, glucose, etc., as compiled by the Associated Corn Products Manufacturers from reports of manufacturers.

These tables show that there has been a decrease in the quantity used for alcohol and other spirits; but this has been more than offset by the 30 or 40 million bushel increase in the grindings by cornstarch and glucose mills.

It must be remembered, however, that this does not show that the total industrial demand for corn remained unchanged. The amounts taken remained roughly unchanged, but this was in the face of a reduction in the purchasing power of corn. The total industrial demand for corn then must have decreased considerably since 1920.

#### APPENDIX VIII

There are several reasons for the lack of agreement between the numbers of hogs on farms and total hogs slaughtered.

In the first place, with the passage of time a larger proportion of total hog slaughter has been coming under federal inspection. The proportion grew from 48 percent in 1900 to about 66 percent in 1925. Most of the increase in this proportion, however, took place before 1920.

A more important change since 1920 is the shifts that have occurred in the geographical distribution of hog production. "Rather significant changes took place in the geographical distribution of hogs between 1920 and 1925 and very slight changes between 1925 and 1929. In 1920 about 37 percent of the hogs in the United States were in the West North-Central states; in 1925 the proportion had increased to 50 percent. In 1920, 31 percent of the hogs of the country were in the South Atlantic and South Central states; in 1925 only 20 percent. Changes in other sections were small, altho there was a tendency for production in both the North-Atlantic and East North-Central states to decline in relative importance. This tendency toward concentration, which has brought half of the hogs in the country into the West North-Central states, where hog production is conducted rather efficiently, accounts for a part of the increase in the output of pork."<sup>4</sup>

An additional effect of these geographical shifts is that it has brought hogs into the area in which the highest proportion of total hog slaughter comes under federal inspected slaughter. This would increase the proportion of federal inspected slaughter to total slaughter.

Furthermore, improvement has taken place in the technique of hog production.

"Apparently the campaign for more sanitary methods of production, which has resulted in appreciably larger litters of pigs saved and reduced the losses from cholera and other diseases,—and the use of better animals"<sup>5</sup> are enabling a given hog population on farms to produce more hogs for market now than formerly.

Finally, either one or both of the two series may be revised in the light of the 1930 census figures. Such a revision might lessen the disparity between the two series.

<sup>4</sup>University of Illinois Agricultural Experiment Station Bulletin 363, Prices of Illinois Farm Products from 1921 to 1929, by L. J. Norton, page 539.

<sup>5</sup>U. S. D. A. mimeographed publication, Regional Changes of Farm Animal Production in Relation to Land Utilization, by O. E. Baker, 1929. Page 25. See also U. S. D. A. Yearbook, 1930, page 848, table 873.

## APPENDIX IX

### CHANGES IN UNITED STATES DOMESTIC DEMAND FOR CORN DUE TO LIVESTOCK AND OTHER POPULATION CHANGES

1867-1930

(000's omitted)

DATE	A No. of hogs on farms & elsewhere* (No. on farms x 1.032)	B Estimated hog consumption of corn** (Ax19.7)	C No. of horses & mules on farms & elsewhere* (No. on farms x 1.145)	D Estimated horse & mule consumption of corn (Cx22.3)	E No. of cattle on farms & elsewhere (No. on farms x 1.020)	F Estimated cattle consumption of corn (Ex8.6)	G No. of poultry on farms Jan. 1st	H Estimated poultry consumption of corn (Gx0.33)	I U. S. human population	J Estimated human consumption of corn (Ix0.37)	K No. of sheep on farms	L Estimated sheep consumption of corn (Kx0.61)	TOTAL of B.D.F. H. J. and L.
1867	25,484	502,034	7,125	158,888	20,662	130,369	92,347	30,475	35,078	129,789	39,385	24,025	981,580
1869	25,095	494,372	7,572	168,856	21,232	140,131	94,898	31,316	36,238	134,081	38,992	23,785	992,941
1863	24,062	474,021	8,307	185,240	22,055	145,503	97,449	32,158	37,398	138,383	37,724	23,012	998,373
1870	27,907	543,858	9,469	211,159	26,223	173,072	100,000	33,000	39,558	142,665	28,478	17,372	1,121,126
1871	30,401	598,900	11,386	253,908	26,996	178,174	102,551	33,941	39,718	146,957	31,851	19,429	1,231,209
1872	32,814	646,436	11,756	262,159	27,468	181,289	105,102	34,684	40,878	151,249	31,679	19,324	1,295,141
1873	33,676	663,417	12,059	268,016	27,773	183,302	107,653	35,525	42,038	155,541	32,002	20,131	1,326,832
1874	31,849	627,425	12,221	272,528	27,704	182,846	110,204	36,367	43,198	159,833	33,938	20,702	1,299,701
1875	28,960	570,512	12,478	278,259	28,009	184,859	112,755	37,209	44,358	164,125	33,784	20,608	1,255,572
1876	26,550	523,035	12,095	289,789	28,678	189,295	115,306	38,051	45,518	168,417	35,935	21,920	1,230,487
1877	26,976	570,827	13,281	296,166	30,084	198,422	117,857	38,893	46,878	172,709	35,804	21,850	1,298,857
1878	33,294	655,982	13,703	305,577	31,408	207,293	120,408	39,735	47,838	177,001	35,740	21,801	1,407,299
1879	35,879	706,816	14,487	323,060	34,198	225,707	122,959	40,576	48,998	181,293	38,124	23,246	1,500,708
1880	35,123	691,923	13,935	310,751	34,222	225,865	125,507	41,417	50,155	185,574	35,192	21,467	1,476,997
1881	37,408	736,038	15,058	338,793	34,274	226,208	141,517	79,701	51,434	190,306	43,570	26,578	1,595,524
1882	45,534	897,020	14,149	315,523	36,933	243,758	157,527	51,984	52,713	195,038	45,016	27,460	1,730,783
1883	44,655	879,704	14,532	324,510	42,366	279,616	173,537	67,237	69,992	199,770	49,237	30,035	1,713,635
1884	46,615	898,615	14,981	334,076	43,781	288,855	189,547	62,551	55,271	204,503	50,627	30,882	1,819,582
1885	45,588	917,784	15,501	345,872	45,041	297,271	205,657	67,834	66,550	209,235	50,360	30,720	1,868,516
1886	46,667	937,070	16,159	360,246	46,830	309,078	221,667	73,117	67,829	213,967	48,322	29,476	1,923,054
1887	46,041	907,008	16,733	373,146	49,427	326,218	237,677	78,400	69,108	218,700	44,759	27,304	1,930,775
1888	45,766	901,590	17,593	392,324	50,662	334,369	253,587	83,084	60,387	223,432	43,545	26,623	1,962,022
1889	51,612	1022,666	18,230	406,529	51,791	341,821	269,597	88,967	61,666	228,164	42,599	25,985	2,114,132
1890	53,254	1049,104	19,768	440,826	54,333	358,598	258,109	85,176	62,176	232,904	35,935	21,920	2,188,528
1891	52,345	1029,227	18,725	417,568	54,430	359,238	257,360	84,929	64,252	237,732	43,431	26,493	2,155,187
1892	54,075	1065,278	20,396	454,831	55,635	367,191	256,811	84,682	65,557	242,561	44,936	27,412	2,241,955
1893	47,870	937,129	21,226	473,340	53,897	355,720	256,882	84,434	66,862	247,399	47,274	28,837	2,126,849
1894	46,653	919,064	21,106	470,664	54,635	360,591	254,113	84,187	68,167	252,218	45,048	27,479	2,114,203
1895	45,679	897,906	20,869	465,379	52,344	345,470	254,364	83,940	69,472	257,046	42,294	25,799	2,075,540
1896	44,214	871,016	19,926	444,350	49,621	327,615	253,615	83,693	70,777	261,875	38,299	23,362	2,031,795
1897	41,899	825,410	18,986	423,366	47,797	315,460	252,866	83,446	72,082	266,703	36,819	22,460	1,936,845
1898	41,032	808,330	18,403	412,394	46,413	306,326	255,117	83,199	73,387	271,532	37,657	22,971	1,904,752
1899	39,889	785,813	18,090	403,407	45,260	298,716	251,368	82,951	74,692	276,360	39,114	23,860	1,871,107

222

2,245,536  
2,269,203<sup>†</sup>  
2,412,070  
2,354,881  
2,399,243  
2,417,588  
2,410,851  
2,392,909  
2,417,824  
2,441,188



CHANGES IN UNITED STATES DOMESTIC DEMAND FOR CORN DUE TO LIVESTOCK AND OTHER POPULATION CHANGES

1867-1930  
(000's omitted)

DATE	A No. of hogs on farms & else- where* (No. on farms x 1.032)	B Estima- ted hog consump- tion of corn** (Ax19.7)	C No. of horses & mules on farms & elsewhere (No. on farms x 1.145)	D Estimated cattle con- sumption of corn (Cx22.3)	E No. of cattle on farms & else- where (No. on farms x 1.029)	F Estimated cattle con- sumption of corn (Ex6)	G No. of poultry on farms Jan. 1st	H Estimated poultry consump- tion of corn (Gx0.33)	I U. S. human popula- tion	J Estimated human consump- tion of corn (Ix0.37)	K No. of sheep on farms	L Estima- ted sheep consump- tion of corn (Kx0.61)	TOTAL of B.D.F. H. J. and L.
1860	54,283	1069,375	24,654	549,784	59,186	390,716	250,623	82,706	75,994	281,178	61,504	37,517	2,441,189
1901	54,902	1081,569	22,452	500,879	82,300	411,180	255,149	84,199	77,592	287,090	59,757	36,452	2,401,189
1902	44,298	951,471	22,085	492,496	64,019	422,525	259,675	85,693	79,190	293,003	62,039	37,844	2,283,032
1903	48,710	959,587	22,081	492,063	65,638	433,211	264,201	87,186	80,788	298,916	63,965	39,019	2,309,982
1904	51,094	1006,355	22,321	497,758	65,997	435,580	263,727	88,690	82,386	304,828	61,630	31,493	2,361,695
1905	53,644	1057,181	22,839	509,310	65,859	434,889	273,253	90,173	83,994	310,741	45,170	27,554	2,429,628
1906	56,347	1110,036	25,231	564,881	64,695	428,987	277,779	91,667	85,582	316,653	50,632	30,886	2,541,110
1907	59,134	1164,940	26,981	601,876	64,182	423,601	282,305	93,161	87,180	322,566	53,240	32,478	2,638,420
1908	63,282	1246,261	27,321	609,258	62,557	412,876	286,831	94,654	88,778	328,479	54,631	33,325	2,724,853
1909	58,824	1158,833	28,273	630,488	61,893	404,996	291,337	96,148	90,376	334,399	56,094	34,211	2,659,015
1910	50,878	1002,297	27,529	613,897	59,630	393,492	295,890	97,640	91,972	340,296	52,448	31,993	2,479,625
1911	57,482	1132,365	28,167	628,124	57,849	381,806	303,575	100,180	93,246	345,380	53,633	32,716	2,620,598
1912	57,482	1132,365	28,477	635,037	56,618	373,679	311,270	102,719	94,720	350,501	52,362	31,941	2,626,272
1913	55,728	1097,842	28,646	639,698	57,452	379,183	318,965	105,258	96,094	355,548	51,462	31,404	2,608,933
1914	53,458	1053,123	29,096	648,841	60,440	398,904	326,660	107,798	97,468	360,362	49,719	30,329	2,599,357
1915	58,824	1158,833	29,397	655,553	64,345	424,677	334,355	110,337	98,842	365,715	49,956	30,473	2,745,588
1916	61,610	1213,717	29,486	657,538	68,319	450,905	342,050	112,877	100,216	370,799	48,625	29,661	2,835,497
1917	58,514	1152,726	29,692	662,154	71,549	472,223	349,745	115,418	101,590	375,883	47,616	29,046	2,807,448
1918	63,158	1244,213	30,260	674,798	73,295	483,747	357,440	117,955	102,964	380,967	48,603	29,648	2,931,328
1919	65,842	1297,087	30,269	674,998	72,209	477,173	365,135	120,496	104,338	386,051	48,866	29,808	2,985,612
1920	61,878	1218,907	28,846	643,265	70,868	467,729	372,826	123,032	105,710	391,127	39,025	23,805	2,889,950
1921	60,477	1191,397	28,239	629,730	69,132	456,291	380,520	125,572	107,417	397,443	37,452	22,846	2,823,279
1922	61,465	1210,861	28,079	626,162	69,215	456,819	388,215	126,111	109,123	403,755	36,327	22,159	2,847,867
1923	71,253	1403,694	27,608	615,658	68,075	449,295	395,910	130,650	110,829	410,067	37,223	22,706	3,032,060
1924	68,485	1349,155	27,135	605,111	66,318	437,699	403,605	133,190	112,536	416,383	38,361	23,400	2,964,938
1925	57,346	1129,718	26,413	568,710	63,794	421,040	411,300	135,729	114,242	422,695	38,112	23,248	2,899,198
1926	53,817	1060,195	24,698	550,765	60,837	401,534	418,995	138,268	115,949	429,011	39,730	24,235	2,694,008
1927	56,541	1113,858	23,799	530,718	58,480	385,968	426,690	140,808	117,655	435,324	41,881	25,547	2,632,223
1928	62,353	1228,354	22,982	512,499	57,296	378,154	434,385	143,347	119,362	441,639	44,554	27,178	2,731,171
1929	56,715	1117,286	22,300	497,200	57,369	378,628	442,080	145,886	121,068	447,952	47,171	28,774	2,615,816
1930	62,600	1036,220	21,482	479,049	59,648	393,677	449,775	148,326	122,776	454,268	48,913	29,837	2,541,477

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Livestock data from U. S. D. A. Yearbooks; human population data from census reports.

\*Numbers on farms multiplied by a factor to include those not on farms. Factor given in Appendix, "Livestock not on farms."

\*\*Numbers of hogs multiplied by 10.7, the estimated consumption per head. The figure 19.7 is derived by dividing 40 percent of United States average corn production 1912-1921 by the average number of hogs for the same period.

†The livestock figures from 1890 to 1899 show a marked downward movement followed by a jump from 1899 to 1900, the census year. One-tenth of this 1899-1900 difference in these data in the last column has therefore been added cumulatively to the 1890-1899 figures.