ECONOMIC FACTORS IN CATTLE FEEDING

IV. CATTLE FEEDING CONDITIONS IN THE CORN BELT

By Herbert W. Mumford and Louis D. Hall

TOTAL CATTLE OTHER THAN MILCH COWS IN CORN-BELT STATES
SUMMARY

1. INTRODUCTION.—Seven corn-surplus states—Ohio, Indiana, Illinois, Missouri, Kansas, and Nebraska—embrace the corn belt, which is the natural center of beef production. About one-third of the cattle of the country other than milch cows are contained in the states named, and their value is equal to about two-fifths of the total value of such cattle in the United States.

2. RAPID EVOLUTION OF THE INDUSTRY.—Twenty to fifty years ago, the corn belt as a whole was a combined breeding, grazing and fattening ground for beef cattle, but now it is so generally devoted to corn raising that little grazing land—consequently few breeding cattle—remain; and a large proportion of the cattle fattened for market are purchased as feeders from the West or elsewhere. The number of cattle other than milch cows appears to be diminishing throughout the corn belt, and in some typical districts is now no greater than it was forty years ago.

3. INFLUENCE OF DAIRYING.—Statistics of cattle in corn-belt states indicate a proportion of milch cows amounting to about one-half of the total cattle in the eastern section, one-fourth in Kansas and Nebraska, and corresponding proportions in intervening states. Dairying has increased enormously as a factor in the cattle industry. The introduction of dairy cattle and indiscriminate breeding has deteriorated the quality of beef cattle, and at the same time the actual number of cattle worthy of the name of milch cows has increased but little. Relatively more steers are found in the western than in the eastern portion of the corn belt.

4. FATTENING STEERS.—Four-fifths to nine-tenths of the beef cattle marketed from typical corn-belt localities are cattle that have been purchased as stockers or feeders. The number of stockers and feeders shipped to the country from Chicago and Missouri river markets shows a considerable increase by decades. The fattening of cattle has passed largely from the hands of general farmers to those of professional cattle feeders, and in some sections has been abandoned to a considerable extent by the latter. Among the chief factors responsible for this tendency are relatively high prices for grain compared with those for fat cattle, increase in land values, extension of cattle feeding operations in the West, increase in farm tenancy, and neglect of soil fertility.

5. THE OUTLOOK.—The undeveloped state of beef-cattle production in proportion to population and area justifies the expectation of an ultimate extension and development of cattle raising and feeding. Corn-fed beef cattle doubtless will continue in demand by a class of trade in which the grass beef of the West can not compete. The grazing lands of the West may be expected to furnish a partial supply of stockers and feeders to the corn belt for many years to come; however, an increasing
proportion, and eventually a large proportion, of the cattle matured in the corn belt must be reared there.

Improved and intensified farming methods, the introduction of corn silage, alfalfa and other forage crops, the more complete utilization of waste roughage, and increased attention to manure as a means of maintaining fertility will tend to render cattle production more practicable. Nevertheless, those upon whom the cattle feeder is dependent for his market must consider the increasing cost of producing cattle and pay prices commensurate therewith; the resumption and extension of beef production will come only as a result of higher relative prices for fat cattle.

Note.—This is the fourth of a series of circulars dealing with economic factors in cattle feeding. The circulars that have been published are: No. 163, Relation of the United States to the World’s Beef Supply; No. 164, Argentina as a Factor in International Beef Trade; No. 169, A Review of Beef Production in the United States. The next circular in the series will treat of cattle feeding in its relation to farm management and soil fertility.
CATTLE FEEDING CONDITIONS IN THE CORN BELT

BY HERBERT W. MUMFORD, Chief in Animal Husbandry, and LOUIS D. HALL, Assistant Chief in Animal Husbandry

Seven "corn-surplus states"—Ohio, Indiana, Illinois, Iowa, Missouri, Kansas, and Nebraska—embrace the great corn-producing area and constitute the natural center of beef production in the United States. As shown in Circular No. 169, about one-third of the cattle of the country other than milch cows are contained in the states mentioned, and their value is equal to about two-fifths of the total value of such cattle in the United States. Furthermore, large numbers of cattle are shipped into these states to be fattened and forwarded to market, and are not included in the estimates of annual cattle population. Corn-fed cattle are the distinctive feature of the cattle industry of the United States, and this circular deals primarily with problems and methods of cattle feeding in the corn belt. It is therefore proper to consider somewhat fully the trend of general conditions surrounding the industry in that section and the fundamental economic factors that affect it.

RAPID EVOLUTION OF THE CATTLE FEEDING INDUSTRY

During the period of settlement and the earlier years of cultivation of corn-belt lands—a period extending from the fifties to the nineties inclusive, of the last century,—these lands generally were stocked with cows of beef type; and while the country was being brought into cultivation, they became a combined breeding, grazing, and fattening ground for cattle. Such localities were admirably suited to beef production because of the abundance of cheap grass and cheap corn they afforded. A most vivid and concise illustration of cattle-feeding conditions and methods in Illinois about 1880 is contained in the following statement quoted from one of the most widely known stockmen of that day, Mr. John D. Gillette:¹

COST OF STEER TWELVE MONTHS OLD

Value of calf at birth ........................................ $3.00

Expenses of dam of calf, chargeable to calf for one year as follows:

8 percent interest on $50, value of cow .......................... 4.00
Keep of yearling and feed of cow 12 months ...................... 12.25
Insurance on cow .................................................. 1.00
Risk of failure of cow to breed .................................. 1.75
Loss of calves by death, etc. ...................................... 1.00
No corn fed up to 12 months.

Value of pasture and keep up to 12 months ....................... 6.00

Total ................................................................. 29.00

Weight of calf at 12 months, 700 pounds, at 5 cents ............ 35.00
Profit at 12 months of age ....................................... 6.00

COST FROM TWELVE TO TWENTY-FOUR MONTHS OF AGE

Value of steer at 12 months of age ................................ 35.00
Value of shock corn, 110 bushels, at 35 cents .................. 38.50
Pasture 12 to 24 months ......................................... 3.00
Interest and risk ................................................... 2.80

Total ................................................................. 79.30

Less 500 pounds of pork made on droppings of steer, at 5 cents.. 25.00
Net cost 12 to 24 months ........................................ 54.30

Weight of steer at 24 months, 1,600 pounds, at 6½ cents ....... 104.00
Profit at 24 months of age ....................................... 49.70

COST FROM TWENTY-FOUR TO THIRTY-SIX MONTHS OF AGE

Value of steer at 24 months of age .............................. 104.00
Value of shock corn consumed in entire year, 125 bu., at 35 cents. 43.75
Pasture, May 1 to Nov. 1 ........................................ 4.00
Interest and risk ................................................... 8.32

Total ................................................................. 160.07

Less 500 pounds pork at 5 cents, made on droppings of steer .......................... 25.00
Cost at 36 months of age ........................................ 135.07

Weight at 36 months of age, 2,200 pounds, at 7 cents .......... 154.00
Profit at 36 months of age ...................................... 18.93
As the remarkable corn-growing possibilities of the soil and climate in the corn belt became more and more evident and the demand for corn grew greater, the westward movement of agriculture naturally stimulated the growing of corn and, to a corresponding degree, diminished the area of grazing land. Gradually, but surely, the plow drove out the cow until in the heart of the corn country but few females of the beef type remained. For thirty years or more in some such sections, it has been a proverb that "it does not pay to keep a cow a year for the chance of a calf."

At the same time that conditions within the corn belt were tending to reduce the rearing of beef cattle there, the industry was extending on the great breeding ground of the Southwest and the grazing lands of the West (see Circular No. 169). Thus an increasing supply of cheap stockers and feeders from the range was a further large factor in causing the abandonment of cattle raising by many farmers, who reasoned—and logically so—that calves could be produced and grown more economically on the cheap grass lands of the West than on corn-belt farms. Moreover, the attractive opportunities which the range country offered the cattleman induced many live-stock farmers of the Mississippi valley to migrate west, thus diminishing still further the proportion of cattle feeders to grain growers in the central states.

The extent to which this change in conditions has affected beef production is indicated somewhat accurately by the results of inquiries that have been made on an extensive scale among cattle feeders of Illinois and Indiana. In 1902 this experiment station secured reports of methods used by 509 cattle feeders in Illinois, and found that only 12 percent raised their entire supply of feeding cattle. It was estimated that only about 15 percent of the native steers marketed in Chicago from Illinois were carried from birth to maturity without changing hands.

The Indiana Experiment Station in 1906 investigated the methods of 929 cattle feeders in Indiana, and reported that "only 6 percent are really beef producers, that is, breeding their own

NUMBER OF BEEF CATTLE IN THE CORN BELT STATES IN 1913.
cattle and feeding them out." About one-half of the total number raised a part of their feeding cattle, and 42 percent made a practice of purchasing all their feeders. 1

It is significant that a considerably smaller proportion of breeders was found in Indiana than in Illinois. Altho the data are not strictly comparable, owing to possible differences in the class of cattle feeders represented and an interval of four years between the two investigations, it is undoubtedly true that the decrease in the proportion of breeders to feeders of beef cattle has moved gradually from the eastern to the western border of the corn belt.

Notwithstanding the abandonment of cattle breeding by a majority of the more extensive beef producers, the aggregate number of cattle in the region under consideration shows an increase from 1870 to 1910, altho in but few instances did it keep pace with the population. This is due mainly to the large number of farmers who keep only a few cattle to furnish the family supply of milk and beef and to consume the waste roughage and forage of the farm. The statistics for the years 1911, 1912, and 1913 show an actual decrease in the number of cattle in the corn belt. In order to illustrate this point more fully, Table 1 is presented.

### Table 1.—Number of Cattle Other than Milch Cows in the Corn-Belt States

<table>
<thead>
<tr>
<th>States</th>
<th>1870 1</th>
<th>1890 1</th>
<th>1910 2</th>
<th>1911 3</th>
<th>1912 3</th>
<th>1913 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ohio</td>
<td>801 000</td>
<td>918 000</td>
<td>978 000</td>
<td>942 000</td>
<td>885 000</td>
<td>814 000</td>
</tr>
<tr>
<td>Indiana</td>
<td>750 000</td>
<td>1 054 000</td>
<td>1 020 000</td>
<td>744 000</td>
<td>707 000</td>
<td>686 000</td>
</tr>
<tr>
<td>Illinois</td>
<td>1 224 000</td>
<td>1 765 000</td>
<td>1 974 000</td>
<td>1 391 000</td>
<td>1 266 000</td>
<td>1 228 000</td>
</tr>
<tr>
<td>Iowa</td>
<td>815 000</td>
<td>2 680 000</td>
<td>3 611 000</td>
<td>2 949 000</td>
<td>2 773 000</td>
<td>2 607 000</td>
</tr>
<tr>
<td>Missouri</td>
<td>731 000</td>
<td>1 819 000</td>
<td>2 165 000</td>
<td>1 671 000</td>
<td>1 501 000</td>
<td>1 444 000</td>
</tr>
<tr>
<td>Kansas</td>
<td>346 000</td>
<td>1 921 000</td>
<td>3 260 000</td>
<td>2 202 000</td>
<td>1 872 000</td>
<td>1 778 000</td>
</tr>
<tr>
<td>Nebraska</td>
<td>55 000</td>
<td>1 346 000</td>
<td>3 040 000</td>
<td>2 225 000</td>
<td>2 002 000</td>
<td>1 902 000</td>
</tr>
</tbody>
</table>

| Total     | 4 722 000 | 11 503 000 | 16 048 000 | 12 094 000 | 11 009 000 | 10 459 000 |

INFLUENCE OF DAIRYING

The remarkable growth of large and small cities throughout this fertile section resulted in a corresponding demand for milk and butter. This could be met only by the establishment of dairy farms within comparatively short distances from the cities and an increased production of dairy products on general farms; whereas the supply of beef could readily be secured from greater distances, especially in view of the increasing beef production of the range country at this time.

Table 2 shows the actual number of milch cows and also the proportion of milch cows to total cattle in the corn-belt states by twenty-year periods since 1870, including 1913.

<table>
<thead>
<tr>
<th>States</th>
<th>1870</th>
<th>Number</th>
<th>1890</th>
<th>Number</th>
<th>1910</th>
<th>Number</th>
<th>1913</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ohio</td>
<td>734 000</td>
<td>48</td>
<td>783 000</td>
<td>46</td>
<td>847 000</td>
<td>49</td>
<td>869 000</td>
<td>52</td>
</tr>
<tr>
<td>Indiana</td>
<td>435 000</td>
<td>37</td>
<td>608 000</td>
<td>36</td>
<td>687 000</td>
<td>40</td>
<td>634 000</td>
<td>48</td>
</tr>
<tr>
<td>Illinois</td>
<td>683 000</td>
<td>36</td>
<td>1 094 000</td>
<td>38</td>
<td>1 232 000</td>
<td>38</td>
<td>1 007 000</td>
<td>45</td>
</tr>
<tr>
<td>Iowa</td>
<td>465 000</td>
<td>36</td>
<td>1 279 000</td>
<td>32</td>
<td>1 570 000</td>
<td>30</td>
<td>1 337 000</td>
<td>34</td>
</tr>
<tr>
<td>Missouri</td>
<td>371 000</td>
<td>34</td>
<td>881 000</td>
<td>31</td>
<td>925 000</td>
<td>30</td>
<td>789 000</td>
<td>35</td>
</tr>
<tr>
<td>Kansas</td>
<td>162 000</td>
<td>32</td>
<td>758 000</td>
<td>28</td>
<td>737 000</td>
<td>18</td>
<td>698 000</td>
<td>28</td>
</tr>
<tr>
<td>Nebraska</td>
<td>35 000</td>
<td>39</td>
<td>424 000</td>
<td>24</td>
<td>879 000</td>
<td>22</td>
<td>607 000</td>
<td>24</td>
</tr>
</tbody>
</table>


Passing from the eastern to the western states of the corn belt, the percentages in the right-hand column show a remarkably uniform decrease in the proportion of milch cows. Approximately one-half of the cattle of Ohio, Indiana, and Illinois are classified as milch cows, while only about one-fourth of those of Kansas and Nebraska are so classified.

As in the case of beef cattle, the increase in the number of milch cows has been much less marked during the last twenty years than in the previous period, owing to the less pronounced changes in population and industrial development. The slight increase in the proportion of milch cows to the total number of cattle in Ohio, Indiana, and Illinois during forty years does not
adequately represent the increased importance of dairying as a factor in the cattle industry, nor the extent to which the dairy type predominates in the cattle stock of the states mentioned. It is a result of the extension of general farming and the neglect of systematic beef-cattle breeding, together with a great tendency on the part of the average farmer to cross-breed cattle of the beef and dairy types, thereby deteriorating the quality of both. In this way the relative number of animals worthy of the name of milch cows has been limited, and at the same time in most corn-belt localities, the production of steers suitable for the feed lot has very nearly approached the vanishing point.

The marked decrease in the proportion of milch cows to the total number of cattle in the four states west of Illinois, in spite of a large increase in their actual numbers, is explained by the general movement of range cattle into those states from the Southwest and West. It is likely with increased population and the adoption of intensive systems of agriculture, the proportion of milch cows will approach more nearly that of the states farther east.

Further light may be thrown on the types and classes of cattle kept on corn-belt farms by summarizing the returns of the United States Census relating to age and sex of cattle. Figures from the Twelfth Census are presented because of the more minute classification it affords in this particular.

**Table 3.—Relative Proportion of Various Classes of Cattle in the Corn-Belt States in 1900**

<table>
<thead>
<tr>
<th>States</th>
<th>Calves under 1 year</th>
<th>Steers 1 and under 2 years</th>
<th>Steers 2 and under 3 years</th>
<th>Steers 3 years and over</th>
<th>Bulls 1 year and over</th>
<th>Heifers 1 year and over</th>
<th>Dairy cows 1 year and over</th>
<th>Dairy cows 2 years and over</th>
<th>Dairy cows 2 years and over</th>
<th>Other cows 2 years and over</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ohio</td>
<td>23.6</td>
<td>10.6</td>
<td>6.9</td>
<td>4.4</td>
<td>1.9</td>
<td>10.4</td>
<td>41.0</td>
<td>4.2</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indiana</td>
<td>25.0</td>
<td>11.9</td>
<td>8.3</td>
<td>2.4</td>
<td>1.7</td>
<td>10.7</td>
<td>35.2</td>
<td>5.1</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illinois</td>
<td>22.8</td>
<td>11.4</td>
<td>9.5</td>
<td>3.7</td>
<td>1.9</td>
<td>10.4</td>
<td>33.4</td>
<td>7.2</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iowa</td>
<td>23.8</td>
<td>13.5</td>
<td>11.2</td>
<td>3.2</td>
<td>1.7</td>
<td>10.9</td>
<td>27.2</td>
<td>8.5</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Missouri</td>
<td>24.1</td>
<td>12.7</td>
<td>12.0</td>
<td>5.2</td>
<td>1.4</td>
<td>10.3</td>
<td>26.6</td>
<td>10.7</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kansas</td>
<td>20.5</td>
<td>12.4</td>
<td>11.7</td>
<td>9.5</td>
<td>1.4</td>
<td>9.9</td>
<td>15.7</td>
<td>18.9</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nebraska</td>
<td>23.6</td>
<td>12.5</td>
<td>9.9</td>
<td>3.9</td>
<td>1.6</td>
<td>10.8</td>
<td>16.7</td>
<td>21.0</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>22.7</strong></td>
<td><strong>12.4</strong></td>
<td><strong>10.4</strong></td>
<td><strong>4.6</strong></td>
<td><strong>1.6</strong></td>
<td><strong>10.5</strong></td>
<td><strong>26.1</strong></td>
<td><strong>11.7</strong></td>
<td><strong>100</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Calculated from Abstract of Twelfth Census, 1900, pp. 238, 246, 246, 247.
The smaller proportion of milch cows in the more westerly states, as previously shown, is here verified, and a correspondingly larger proportion of other cows is noted.

Relatively more steers are found in the western portion of the corn belt, and the difference is more marked in the case of the older than in that of the younger steers, thus showing the natural tendency to keep cattle longer in those sections of the country where pasture lands are both cheaper and more abundant. With respect to the proportion of calves under one year, heifers under two years, and bulls, the data show no striking differences; and likewise, with regard to the proportion of bulls to cows and the proportion of calves to cows, the various sections of the corn belt appear comparatively similar.

Table 4 gives available data from the Thirteenth Census. While these data are not in all respects comparable with similar data from the Twelfth Census, they show the same general tendencies.

### Table 4.—Relative Proportions of Various Classes of Cattle in the Corn-Belt States in 1910

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ohio</td>
<td>13.9</td>
<td>46.3</td>
<td>12.8</td>
<td>49.3</td>
<td>7.7</td>
<td>...</td>
<td>100</td>
</tr>
<tr>
<td>Indiana</td>
<td>13.5</td>
<td>46.9</td>
<td>13.3</td>
<td>46.5</td>
<td>9.8</td>
<td>...</td>
<td>100</td>
</tr>
<tr>
<td>Illinois</td>
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<td>12.6</td>
<td>43.0</td>
<td>11.6</td>
<td>...</td>
<td>100</td>
</tr>
<tr>
<td>Iowa</td>
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<td>29.1</td>
<td>12.7</td>
<td>31.6</td>
<td>13.8</td>
<td>...</td>
<td>100</td>
</tr>
<tr>
<td>Missouri</td>
<td>11.6</td>
<td>31.0</td>
<td>12.0</td>
<td>33.4</td>
<td>12.0</td>
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<td>100</td>
</tr>
<tr>
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<td>12.4</td>
<td>34.1</td>
<td>10.9</td>
<td>23.9</td>
<td>18.1</td>
<td>0.6</td>
<td>100</td>
</tr>
<tr>
<td>Nebraska</td>
<td>12.5</td>
<td>30.0</td>
<td>12.4</td>
<td>21.0</td>
<td>24.0</td>
<td>0.1</td>
<td>100</td>
</tr>
<tr>
<td>Average</td>
<td>12.8</td>
<td>26.9</td>
<td>12.3</td>
<td>33.2</td>
<td>14.7</td>
<td>0.1</td>
<td>100</td>
</tr>
</tbody>
</table>

1 Calculated from Abstract of Thirteenth Census, 1910, pp. 316, 317.
2 Includes unclassified animals.

## Fattening Steers in the Corn Belt

Notwithstanding the rapid extension of the acreage devoted to corn growing, and the great demand that has arisen for corn for other than feeding purposes, the crop is still fed chiefly to farm animals. As nearly as can be estimated, 80 percent of the corn produced in the United States is fed to live stock.1 It is, of

course, more largely sold off the farms of the corn-belt states than
those of other sections of the country, but probably not far from
one-half of the crop of Illinois is fed on the farm.\textsuperscript{1} A temporary
curtailment of one branch or another of the live-stock industry,
especially cattle and hog feeding, is so promptly reflected in a
reduced corn market that stock feeding is quickly resumed to
a greater or less extent, tho with increasing reluctance and mis-
givings. This applies especially to fattening cattle, as this branch
of live-stock production offers the most immediate and ready
means of disposing of large quantities of corn, and at the same
time utilizes much otherwise wasted roughage, such as stalk
fields, corn stover, and straw.

That beef production in the corn belt has become largely a
steer-fattening enterprise apart from breeding is clearly demo-
strated by the investigations of the Illinois and Indiana Experi-
ment Stations quoted in a preceding paragraph. In Illinois it was
found that in 1902 more than one-half of the cattlemen from
whom reports were obtained were feeders who purchased the
cattle they finished for market; in addition, more than one-third
were both feeders and breeders, but even the latter purchased
most of their feeding cattle.\textsuperscript{2} About 85 percent of the native beef
steers marketed in Chicago were fattened after having been pur-
chased as stockers and feeders.\textsuperscript{3} In Indiana in 1906, 929 reports
were received from cattlemen in that state, of whom 42 percent
were found to purchase all their feeding cattle and 52 percent
grew only a part of them and bought the remainder.\textsuperscript{4}

The extent and tendency of this important phase of the in-
dustry are also shown in a measure by the shipments of stockers
and feeders from the large cattle markets during recent decades
(see Table 5).

In the evolution, or transition, of corn-belt beef production
from a cattle-raising to a steer-feeding proposition with a large
proportion of the feeders purchased at the large markets, the
business, to a considerable extent, has gravitated into the hands
of men who handle comparatively large numbers of cattle—from
a few carloads to several hundred head. Tho these professional
cattle feeders in most cases are farmers, they usually buy all

\textsuperscript{1}Ill. Agr. Exp. Sta., Circ. No. 140, p. 8.
\textsuperscript{3}Ill. Agr. Exp. Sta., Circ. No. 79, p. 6.
\textsuperscript{4}Ind. Agr. Exp. Sta., Circ. No. 12, p. 12.
TABLE 5.—SHIPMENTS OF STOCKERS AND FEEDERS FROM VARIOUS MARKETS

<table>
<thead>
<tr>
<th>Markets</th>
<th>1880</th>
<th>1890</th>
<th>1900</th>
<th>1910</th>
<th>1913</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicago²</td>
<td>136,000⁴</td>
<td>647,000⁴</td>
<td>724,000⁴</td>
<td>406,000⁴</td>
<td>380,000⁴</td>
</tr>
<tr>
<td>Kansas City</td>
<td>266,000⁴</td>
<td>294,000⁴</td>
<td>431,000⁴</td>
<td>405,000⁴</td>
<td>405,000⁴</td>
</tr>
<tr>
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<td>102,000⁴</td>
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<td>178,000⁶</td>
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<td>Buffalo¹¹</td>
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1 From reports of Stock Yards Companies.
2 Statistics for 1880 and 1890 not obtainable.
3 Estimated.
4 1905. Statistics for 1900 not obtainable.
5 Statistics for 1880 not obtainable.
6 1897. Statistics for 1890 not obtainable.
7 Statistics for 1830, 1890, and 1900 not obtainable.
8 1908. Statistics for 1900 not obtainable.
9 1901. Statistics for 1900 not obtainable.
10 1898. Statistics for 1890 not obtainable.
11 Cattle shipments not classified as to stockers and feeders.

In some sections of the corn belt, cattle feeding has not only...
passed largely from the hands of general farmers to the large feeders, but has also been abandoned to a considerable extent by the latter. This tendency may be assigned to several causes:

(1) Prices of grain have been relatively higher than those of cattle, and inducements to sell corn for cash at the elevator instead of feeding have therefore been strong. (2) Land has increased rapidly in value, and it is a prevalent idea that high-priced land prohibits profitable cattle feeding. As a matter of fact, the actual influence of this factor is usually insignificant as compared with prices of corn and cattle in determining the profit in feeding cattle. Increased value of farm lands has made it possible for many cattlemen to retire or to relinquish active management of their farms to others less competent to engage profitably in the business. (3) Opportunities for cattle feeding in various portions of the West have attracted many successful cattle feeders from the older sections of the corn belt. The opportunities for exclusive grain growing in these newer regions have not been equally attractive; hence there has been a tendency for a large exodus of live-stock producers, while the grain growers more generally have remained. (4) The farms in many of the older, more prosperous communities have become occupied largely by tenants. The prevailing system of short-term leases and a lack of experience in feeding cattle on the part of tenants have resulted in a marked decrease not only in cattle feeding but in the production of live stock of all kinds. (5) The apparent continuation of satisfactory crop yields in a large part of the corn belt has resulted in a failure to appreciate the value and necessity of manure. This fact has blinded most farmers to an important factor in cattle feeding. (6) The fact that cattle, ready for the feed lot, could be produced cheaper in the West than in the corn belt has caused the general farmer, who produced his own feeders and did not use enough cattle to pay to buy them from the western country, to go out of the live-stock business. That is, at the prevailing prices he could not compete in the production of beef with the "big feeder," who was able to place his cattle in the feed lot at a lower cost than they could be produced in the corn belt.

**THE OUTLOOK**

In the light of conditions set forth in this and foregoing circulars, a few general deductions may safely be drawn relative to
the probable future trend of beef production in the corn-growing section of the United States.

The undeveloped state of cattle production in proportion to the population and the area of the United States as compared with the condition of the industry in older countries justifies the expectation of an ultimate extension and development of cattle raising and feeding in this country. The rapid increase of population and the slower rate of increase in the number of cattle have rendered the export beef trade a relatively insignificant factor; but with a large domestic demand in proportion to the supply, and limited competition from abroad, the industry should be practically independent of foreign trade. General market conditions are now and promise to remain favorable to the producer, for he has a domestic market as a regular outlet and a foreign market as an influential regulator of prices and as an elastic consumer of surplus.

The "passing of the range" has not diminished the number of western cattle entering the markets, but the growing population of the West and, consequently, the increased amount of beef slaughtered and consumed in that section have reduced the relative importance of western cattle as a factor in corn-belt markets. Further, corn fed beef cattle, which can be properly and profitably finished only within a limited section of the country, doubtless will continue in demand by a class of trade in which the cheaper grass beef of the West cannot compete.

Notwithstanding the general subdivision of western ranges and ranches by settlers, the fact that large areas of the West and Southwest are adapted only to grazing indicates that these sections will continue to produce a considerable number of feeding cattle. As Ireland with her abundance of grass has grown "store" or feeding cattle for the farmers of England and Scotland for many years and continues to do so, similarly the grass lands of our great West and South may reasonably be expected to supply stockers and feeders to large markets of the corn belt for many years to come.

An increasing proportion, and eventually a large proportion, of the cattle matured in the corn belt, however, must be reared there; because, as explained in Circular 164, the quality of western cattle will be adversely affected by an increased proportion of
cattle of the dairy type, and at the same time the development of agriculture will facilitate the finishing of a larger proportion of feeding cattle on western farms. Certain sections of the corn belt, and some farms in all sections, are partially or wholly unsuited to grain growing, and these lands, in many instances, may be most profitably used for grazing purposes.

With the development of more intensive farming methods, the introduction of corn silage, alfalfa, and forage crops in general will tend to render both cattle raising and feeding more practicable and profitable. Also, regardless of the price of land or of grain, a considerable amount of roughage and aftermath remains to be either fed or wasted on every farm, and this factor will contribute largely toward maintaining beef production in the corn belt.

Eventually, manure will be regarded more highly by corn growers in the Middle West than it is now. Long continued cropping without adequate rotation and fertilization will ultimately compel such attention to manure as it now receives from cattle feeders, not only in Great Britain and Continental Europe, but also in certain parts of Virginia, Pennsylvania, and Ohio. Cattle feeding will be found to be one of the most convenient and satisfactory means of obtaining this valuable fertilizer. This factor is of sufficient importance to be treated at some length in a subsequent circular.

Over against what has been said in the foregoing paragraphs, it must also be clearly understood that a remunerative and reasonably stable market will be indispensable to the further development of the beef-cattle industry. Farming in general, and stock raising in particular, must henceforth be recognized as a capitalized business, the products of which must sell above the cost of production in order to render the enterprise profitable. Those upon whom the cattle feeder is dependent for his returns must consider the increasing cost of producing cattle under present and future conditions, and pay prices commensurate therewith. Unfortunately, the cattle feeder frequently has been compelled to accept very inadequate returns, and seldom has his profit been in full proportion to his outlay if all elements of cost be figured at their just value.

"The important fact connected with the cattle-raising industry is a marked shortage, the extent and far reaching effects
of which the public has by no means fully realized. The con­suming public have complained of the high cost of meats. At times they have accused producers of securing too great profits from the business. There should be no mistake or misunderstand­ing. The present shortage is due primarily to the fact that farmers have found meat production, and primarily beef production, less profitable than other agricultural enterprises. Over-production and cheap meat, while possible, are extremely remote. An increased supply will come, not as a result of lower prices, but only as a result of higher prices. Consumers generally do not appreciate the fact that for a generation or more they have been able to buy meat products at a price which does not cover the cost of production under present-day conditions. It is obvious that the conditions which have brought about the increased cost of meat products will continue to operate even in greater force in the future than in the past.

"The public will ultimately come to understand that the producer must receive more rather than less for his product if an ample supply of meat is to be assured. In the past the price of cattle has been based, so far as it has been based upon anything, upon free or cheap range, cheap land and labor, and cheap corn. Even the cattle feeder of the corn belt has been guilty at times of relying for his profit upon sharp practice in buying feeding cattle for less than the cost of production when the producer, thru drouth or misfortune or possibly a lack of knowledge, has been forced to sell. Few, if any, of these conditions surround the industry today.

"All will readily agree that the producer is entitled to a modest profit in cattle production. No business which depends upon sharp practice, or upon depriving some necessary factor in the trade from its just proportion of the profits of the industry can long survive. It may well be asked, What is a modest profit? In the past, with rapidly changing conditions, it has been next to impossible to answer this question. Conditions are now likely to be more stable; that is, changes will be less frequent and less radical. A business-like beef production which extends over such a vast area of country where conditions surrounding it are so variable naturally presents a most difficult problem. One thing, however, is certain, and that is that if there is any con-

1 Extract from an address by Professor Mumford before the Illinois State Farmers' Institute at Galesburg, February 18, 1914.
siderable increase in the production of beef cattle in the United States, it will come from the establishment of small herds on many farms rather than of large herds on extensive areas. This means, if it means anything, that the price will be fixed by the cost of producing cattle on improved farms, so that ultimately the producer will be by far the most important factor in fixing the price of beef. This does not mean that producers will be permitted to fix a price altogether out of proportion with the cost of production, but one entirely consistent with it.

"Obviously, beef will be most extensively produced where conditions favor its economical production. Can it be denied that any considerable area in this or in any other country offers more favorable conditions for beef production than the corn belt? If not, then the corn belt holds the key to the solution of the cattle situation. Conditions surrounding the industry and the cost of producing beef cattle in the corn belt, therefore, will likely be a large factor in determining the answer to the question of a price basis which will represent the cost of production and a modest profit. Fortunately, nowhere in the country has the cost of production been more carefully worked out or more accurately determined. The largest and most advantageous use of these data is one of the problems of the corn-belt cattlemen.

"No price basis can prevail which does not represent the greatest use of the best methods in cattle production. The cattle raiser who does not and will not avail himself of the most economical practice must be content to accept lessened or, in many instances, no profits. This means that ultimately he must change his ways or go out of business.

"The resumption of cattle raising on many of the smaller corn-belt farms will present problems of marketing which will need adjustment. The producer of less than a carload is now distinctly handicapped, and yet it has just been predicted that the bulk of the cattle in the future will be produced by men who have considerably less than a carload of cattle ready for market at any one time during the year. There will need to be developed, therefore, some method of marketing which gives to the smaller operator substantially the same advantages enjoyed by the larger operators."