PRESENT METHODS OF BEEF PRODUCTION.

IV.

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FEEDS AND THEIR PREPARATION.

It was shown in Part I. of this series that the Illinois cattle feeders represented in this summary consider a more intelligent use of feeds as second only to more intelligent breeding as an important factor in profitable beef production. This fact emphasizes the importance of the subject of this circular, and suggests an inquiry into the present practices of Illinois cattle growers with respect to the feeds used and methods of preparing them. Results obtained on these points in the investigation are herein presented.

PRODUCTION AND PURCHASE OF FEEDS COMPARED.

Because of the increasing agitation concerning the use of commercial feeds a study of the extent to which they have replaced and supplemented the crops grown on the farm is of interest in this connection. In the first place, we conclude from the replies received that only about ten percent of all the correspondents here represented raise all the feed which they use in beef production. It should be said that some of the replies on this point are somewhat vague. It is likely also

Note.—This is one of a series of papers based upon reports received from 509 cattle feeders in Illinois in reply to a list of 100 questions sent to each. The previous numbers, viz.: Circulars No. 79, 88, and 91 will be mailed upon application. For list of questions see Circular No. 65.
that many who do not mention purchased feeds use them at certain
times or use small amounts at all times. Many replies are to the effect
that all feeds used except nitrogenous concentrates are raised on the
farm of the correspondent; many state that as much as possible of the
feed used is raised, and others aim to produce all the roughage. The
above mentioned percentage, however, is believed fairly to represent
the data secured on this point. No doubt a larger proportion of all
feeders in the state raise all their own feed. It must be borne in mind
that the men who furnished the data upon which this summary is
based feed an average of 88 cattle each annually, which is probably
considerably above the average number fattened by all beef producers
in the state. Hence it is safe to assume that considerably more than
ten percent of the latter produce all their own cattle feeds.

Comparing the varieties of feed purchased, we find that 50 percent
of the correspondents who reply buy corn; 21 percent buy linseed oil
meal; 10 percent buy bran; 7 percent, "patent stock foods;" 7 percent,
cottonseed meal; 6 percent, hay; 4 percent, oats; 4.5 percent, "shipstuff,"
"millfeed," shorts, middlings, gluten meal, gluten feed, hominy hearts,
flaxseed meal, brewer's grains or cottonseed hulls; 2.5 percent, clover
hay, straw, or corn-stalk fields. In other words, about one half buy
corn and one-half buy commercial feeds. Farm crops other than corn are
also purchased for feeding cattle by 12.5 percent of the correspondents.

Of the feeds produced on the farm, Indian corn occupies first place
and is produced by practically all the correspondents, the exceptional
instances consisting of those who produce only grass and forage crops.
Next in importance among home grown feeds as reported is hay. Oats,
clover, straw, grass, rye, cowpeas, millet, sorghum, barley, redtop, and
mangels rank next in the order named. These comparisons are based
upon the number of correspondents mentioning each kind of feed.

**Methods of Preparing Corn for Feeding.**

Two questions were asked on this very important point. The re­
plies to the first may be studied separately as to winter and summer
feeding. The question: "How do you feed your corn; that is, in shock,
snapped, in the ear; husked, broken or shelled; do you crush, crack,
grind or soak your corn?" Many of the correspondents mentioned
several methods of preparation. A record was made of the number of
times each method was mentioned, and the data thus secured form the
basis of the following comparisons.

Winter feeding: 25 percent of the replies mention the use of shock
corn; 10 percent mention snapped corn; 39 percent, ear corn; 16 percent
shelled corn; 3 percent, corn and cob meal; 3 percent, corn meal; 2 percent, silage; 2 percent, “all ways.” Two reports also mention the use of cooked corn.

Considering each of these methods separately, it is found that 6 percent of those who feed shock corn shred or cut it. Of those mentioning snapped corn, 16 percent cut or crush before feeding. Of the number who feed ear corn, 15 percent crush, 3 percent split, slice, or chop the ears, 47 percent report preparation by breaking the ears, and doubtless a large proportion of the remaining 35 percent who answer simply “ear corn” prepare it to the extent of breaking at least. Only 2.5 percent of those who feed shelled corn either crack or soak before feeding. The methods involving mechanical preparation of the corn after harvesting (not including shelling) make up 17.5 percent of the total.

Summer feeding: The replies mentioning the use of shock corn are 3 percent of all; those mentioning snapped corn are 3 percent; ear corn, 50 percent; shelled corn, 36 percent; corn meal, 5 percent; corn and cob meal, 3 percent. All those who report the use of shock corn in summer feed the whole fodder. One fourth of those who feed snapped corn at that season cut or crush it. Of the replies mentioning ear corn, 49 percent report breaking the ears, 13 percent crush, 3 percent split, slice or chop, and 3 percent soak the ears; the remainder, 32 percent, do not specify the form in which the ear corn is fed, but a study of the replies warrants the statement that most of them also break the ears. Of those who feed shelled corn, one fifth soak it before feeding. The methods involving mechanical preparation of the corn (not including shelling) make up 17 percent of the total.

Summarizing the results for both winter and summer feeding, we find that shock corn forms 17 percent of all the methods of feeding corn as reported; snapped corn, 8.5 percent; ear corn, 43 percent; shelled corn, 22 percent; corn meal, 4 percent; corn and cob meal, 3 percent; silage, 1 percent; and the replies stating “all ways,” 1.5 percent. The methods by which the corn is mechanically prepared constitute 17.2 percent of the total, while 82.8 percent consist of those in which it is given whole either in shock, snapped, ear or shelled form.

The second question upon this point was: “As the result of your experience, what method or combination of methods of preparing the corn crop has returned the greatest profit, everything considered?” Only 197 correspondents volunteered definite replies. Of these, 24 percent answer in favor of shock corn; 11 percent, shredded corn fodder; 25 percent, shock corn in connection with corn otherwise prepared,
viz., snapped, ear, shelled, crushed or ground corn, corn-and-cob meal or ensilage; 13 percent, shredded corn fodder in connection with the various forms of corn just mentioned; 5 percent, snapped corn (one fifth of these specify the feeding of shelled or ear corn in connection); 7.5 percent, ear corn; 5 percent, the same, with corn stover, shelled corn or corn meal in addition; 5.5 percent, shelled corn; 4 percent, corn and cob meal. It is understood, of course, that these results refer to the feeding of beef cattle in general and not to any particular line of beef production. They must be regarded, therefore, in a very general way. In that light they are interesting as indicating the great utility of the crude corn plant and the favor in which it is held in its natural form as a cattle feed.

SILAGE.

As above indicated, a very small proportion of the correspondents represented in this investigation report the use of silage as a regular practice in the production of beef. Only eight feeders mention silage at all, and of them three feed it only to breeding cattle or calves. In order to determine whether the number shown by the summary was fairly comparable with the data relating to other methods of preparing corn, each correspondent who had reported the use of silage was requested to give the names of all those known by him to be feeding it to beef cattle, and similar letters were sent to prominent cattlemen and others in various parts of the state. The replies to these letters indicate clearly that relatively very few men have employed the silo in beef production in this state and that the percentage given above may be considered as fairly representative on the basis of this summary.

At the present time the writers know of but twenty cattle feeders in Illinois who are using silage for beef production. In general, it may be stated that those who are using silage for fattening steers usually buy young light-weight feeders (600 to 1000 pounds); that they feed silage in largest amounts at the beginning of the fattening period; that abundant shelter is generally provided; that silage is in most instances withdrawn from the ration several weeks before the cattle are finished; and that average gains in live weight appear commonly to be secured when silage is a part of the ration. Several of those who report the use of this form of corn state that its main utility is in preparing cattle for heavy feeding by putting them in condition to feed well; that as an appetizer and a laxative it has great value in starting cattle on feed.

The following statement made by a feeder in Henry County is representative of the experience of several seeders who have contributed to the data at hand:
"I am now fattening my fourth car of beef using silage as one feed per day and with such satisfactory results that I expect to continue its use as long as I am in the cattle feeding business. As to the method of feeding, we feed one-half bushel of silage per head in the morning and scatter five pounds of bran per head over it and stir it all up together; then let the cattle into the shed to the feed. Thus they all have an equal chance to get their share. At noon we feed a hundred hills of shock corn per car of 20 head, and at night a peck of ear corn per head, broken in the boxes, aiming to feed only so much at any one time as the cattle will eat up clean before they leave the racks and boxes. The amounts of shock corn and ear corn are varied so as to give the cattle all they will eat up clean. I find that cattle fed on silage as a part of the ration, while not ready for the market quite as soon as those fed a straight corn ration, make more growth per month during the fattening period than when fed clear corn as is the general practice in this county." This feeder buys in the fall steers weighing 800 to 900 pounds, fed them six to nine months, and reports average gains of 60 pounds per month. He omits silage from the ration during the last month of feeding. His cattle have graded "choice" when fat, selling from 40 to 50 cents per hundred weight below the "top" of the market.

USE OF THE CORN STOVER.

The disposition of the corn stalks is a matter of great importance to every stock farmer, and it was hoped the results of this investigation would aid in determining the extent to which the roughage portion of the corn plant is utilized in feeding by successful cattlemen in Illinois. Only one fifth of the correspondents, however, gave definite and satisfactory replies to the question, the remainder stating merely the use made of that portion of the stalks which is cut as shock corn, in which case the common practice of course is to feed the stalks either with the corn as "fodder" or separate as stover, the waste portion remaining being hauled out as manure. Of those who gave complete and definite replies, 80 percent either pasture the stalks in the field or cut part for shock corn and pasture the remainder; 12 percent plow under all the stalks; and the remainder either burn them or convert them into silage. Only five correspondents state that they cut the entire crop of corn. One man has found it profitable to cut the stalks with a binder after husking the crop, doing the work when the dew is on to avoid loss of leaves. There is no doubt that by far the larger part of the corn stalks of the state are either pastured off in the field or plowed under, but even an approximate estimate of the proportion so disposed of can not be derived from the data secured in this inquiry.
CONCENTRATES FED WITH CORN.

Linseed oil meal is fed by twenty-one percent of those who replied to the questions. The highest amount mentioned per head daily is 6 pounds, the lowest, for young cattle, 2 pounds, and the average of all replies and for all kinds of cattle is 2.2 pounds. The average amount fed to fattening steers is 3 pounds. Its principal use, as gathered from the replies, is for steers toward the close of the fattening period in order to improve the "finish" or bloom and as an aid to digestion. Some report its use only when stock is out of condition; others feed it only when the price is low or when corn is high; some report it equal to cotton seed meal; "new process" meal is less satisfactory than "old process"; and only five percent of all who have fed linseed oil meal have found it unprofitable.

Ten percent of the replies received mention the use of bran. Five pounds per head daily is the average amount calculated from all data secured; the greatest amount mentioned is 13 pounds and the smallest, 1 pound. No unfavorable comments upon bran as a feed are found in the correspondence. Those who express themselves as to its value for cattle regard it very highly. Many, however, state they consider bran too costly to occupy a prominent place in the ration and that they limit its use for that reason, utilizing it mainly for young stock, breeding animals or cows in milk. Several correspondents explain that they feed it only when it is cheap or when corn is very high, or when neither clover nor alfalfa is available.

Cotton seed meal is fed by 7 percent of the correspondents. The largest amount reported per steer per day is 9 pounds, the smallest amount, one pound, and the average of all, 4.1 pounds. Only one of those who report on this feed speaks unfavorably of it. Its advantages, according to the experience of those who report, are that it is cheaper than corn when corn is high; causes more rapid gains and quicker finish and gives a smoother finish than corn and roughage alone.

Judging from the data gathered in this investigation condimental preparations, or "patent stock foods," are bought by the same number of Illinois feeders as cotton seed meal. The advantages claimed for them by those who comment on the results secured are that they increase the amount of feed consumed, aid digestion and give gloss to the hair. A large proportion of those who buy such preparations use them only for young stock or breeding cattle.

Oats occupy a small place in Illinois cattle feeding operations, as only 3 percent of the correspondents mention their use for that purpose.

Various other grains and concentrates, viz.: gluten meal, gluten
feed, hominy hearts, "shipstuff," cottonseed hulls, shorts, middlings, flaxseed meal and brewer's grains are used by about 9 percent of all the correspondents.

**ROUGHAGES USED FOR FULL FEEDING.**

Most of the correspondents mention two or more kinds of roughage preferred for steers on full feed. Comparing these roughages on the basis of the number of times each feed is mentioned we find that clover hay constitutes 34 percent of the replies; corn fodder, 31 percent; hay (kind not specified), 11 percent; timothy hay, 6 percent; oats straw, 4 percent; corn stover, 3 percent; straw, 3 percent; bluegrass hay, 2 percent; the remainder, 6 percent, are divided among cowpea, alfalfa, redtop, sorghum, millet and native hay, sheaf oats, and silage.

**SALT.**

85 percent of the correspondents use barrel salt, 7 percent rock salt, and 8 percent both. Several feeders report the successful use of a mixture of equal parts of salt and wood ashes, the advantages of which are that the steers thus eat the salt slowly and that the mineral substances in the ash are beneficial to the cattle.

65 percent of those who reply keep salt before the cattle at all times; 35 percent feed it at regular intervals.

**WARMING WATER IN WINTER.**

17 percent of the correspondents consider it advisable to warm water for cattle during the winter months. The remainder, 83 percent, do not warm the water more than is necessary to keep it from freezing in exposed tanks.

**PASTURES AND THEIR MANAGEMENT.**

In many of the replies to the question concerning the kind of pasture used more than one kind is mentioned. The following summary is based upon the total number of times each kind is reported. In this way we find that bluegrass constitutes 55 percent of the replies; timothy, 25 percent; clover, 15 percent; redtop, rye, cowpeas, and orchard grass, and those mentioning "tame grass" and "mixed grass," 5 percent.

The question bearing upon the amount of pasture required was as follows: "How many acres of pasture named above, in an average season, are sufficient to carry (a) 20 two-year-old steers, (b) 20 yearling steers, (c) 20 cows or heifers with calves at foot?" A careful study of the replies to this question indicates that in a few instances the figures given relate to cattle fed grain on grass, but this factor is believed to be almost inappreciably small and the replies are assumed to represent approximately the acreage of grass used without grain in addition. For the conven-
ience of the reader the following summary is made on the basis of the number of acres required per head in each instance.

Two-year-old steers: 42 percent of all name less than 2 acres per head; 40 percent name 2 acres, and 18 percent more than that amount. To be more definite, 14 percent name 1 acre or less (the lowest amount being .5 acre); 28 percent, from 1 to 2 acres (two-thirds of which name 1.5 acres); 40 percent, 2 acres; 17 percent, from 2 to 3 acres, and 1 percent, more than 3 acres (the highest being 4 acres).

Yearling steers: 8 percent report less than 1 acre per steer; 33 percent name 1 acre or less; 41 percent name amounts above 1 and not more than 1.5 acres; 21 percent name amounts above 1.5 and not more than 2 acres; and 5 percent report more than 2 acres.

Cows with calves: 8 percent name amounts below 1.5 acres; 55 percent report 1.5 to 2 acres; 37 percent name amounts above 2 acres.

The average date of turning cattle to pasture, as computed from 415 replies, is May 2. The earliest date given is April 1, and the latest June 1. Ninety percent of the dates named are between April 15 and May 15.

The time of taking cattle off pasture varies much more with different feeders than the date of turning to grass in spring. Thus, 18 percent take them from pasture during September; 28 percent during October; 32 percent during November; 8 percent during December, and the remaining 14 percent at various other times during the year.

"How many months do you pasture your cattle intended for market?"

Two percent of the replies to this question report two months or less; 8 percent, 2 to 3 months; 18 percent, 3 to 4 months; 30 percent, 4 to 5 months; 28 percent, 5 to 6 months; 10 percent, 6 to 7 months; 4 percent, more than 7 months. It is observed that in most instances where the pasturing period is less than six months the cattle are turned out at the usual time in spring and finished with grain before the end of the grazing season.

Only one percent of all the correspondents state that they keep cattle off the pastures in July and August. 18 percent, however, feed other green feed in order to supplement the pastures at that time.

Summarizing the reports concerning the daily gain in weight of cattle during the whole grazing season, on grass alone, we find the average of all replies for two-year-old cattle to be 1.87 pounds per day. The greatest daily gain reported is 3 pounds, and the smallest 1 pound, but 80 percent of the reports name amounts from 1.5 to 2.5 pounds. The average of all replies for yearlings is 1.66 pounds per day. The greatest gain mentioned is 3 pounds, and the smallest, 1.5 pound. 75 percent of the replies as to yearlings report from 1 to 2 pounds daily gain.