Special Bulletin No. 146 January, 1932

# Modern Methods in Beef Production

W. H. Peters
W. E. Morris

*Division of Animal Husbandry*
*Division of Agricultural Extension*
*Agricultural Experiment Station*





UNIVERSITY OF MINNESOTA
AGRICULTURAL EXTENSION DIVISION

Published in furtherance of Agricultural Extension, Act of May 8, 1914. F. W. Peck, Director Agricultural Extension Division, Department of Agriculture, University of Minnesota, co-operating with U. S. Department of Agriculture.

## SUMMARY

1. The equivalent of 12,000,000 cattle weighing 1,000 pounds each is required annually to supply the United States with beef.

2. The fat yearling or "baby beef" steer or heifer carcass is at present in greater demand than any other type.

3. Specialization in one of four types of production is essential to success with beef cattle.

4. The maintaining of a cow herd, raising calves, and fattening them as baby beeves on the same farm is an enterprise admirably adapted to many Minnesota farms.

5. While in baby-beef production it is generally considered good practice to allow the calves to nurse their mothers, it has been demonstrated that calves raised on skimmilk can be successfully fattened for marketing as baby beef.

6. In fattening calves for baby beef it must be kept in mind that calves are primarily a means of marketing grain, not roughage.

7. The plan of specialization with beef cattle in which calves are sold as stocker and feeder cattle is practically obsolete in Minnesota.

8. The purchase of thin cattle and fattening them is a type of beef cattle enterprise adapted especially to the farm on which all of the land is suitable to cultivation and where there would be an advantage in having all of the available labor employed in crop production in summer.

9. Getting value received for the money invested at the time of purchase of thin cattle for fattening is of greater importance than the particular type or grade of cattle purchased.

10. Selection of feeds and preparation of rations offer a wide opportunity for the display of judgment and skill in cattle fattening.

11. The purebred beef cattle breeder's opportunity arises through the possible sale of at least part of the calves produced for use as breeding animals at prices above their market value.

12. The risk of loss from disease and parasites is less with beef cattle than with any other important type of farm animal.

## INTRODUCTION

Beef cattle have long been the most fascinating of all types of farm livestock. Men of wealth have chosen beef cattle more often than any other type to establish on farms maintained for pleasure. The romance of early cattle ranching in the United States will live in history and in fiction for many years. Tales of money made and money lost in the cattle fattening enterprise on the corn-belt farm have been told in the past and will again be told in the future. Our large centralized livestock markets and the magnitude of our meat processing and distributing companies have been marvelled at by visitors from foreign countries. On the other hand, statistics show that the importance of the beef cattle industry in the United States has been steadily, tho slowly, declining since about 1890. We find that a one-time export market of considerable proportions has completely disappeared and the beef producer finds it necessary to make a strong stand against imported beef. There yet remains one bright spot for the American beef producer; that is, that 123,000,000 people in the United States are still eating from 50 to 60 pounds of beef annually, and it takes the equivalent of about 12,000,000 cattle weighing 1,000 pounds live weight to supply this demand. These people like beef of good quality and many of them demand beef of good quality. This is sufficient assurance to the beef cattle enthusiast that under favorable conditions he may continue his favorite farm enterprise with assurance of a fair profit.

## PROGRESSIVE DEVELOPMENTS IN BEEF PRODUCTION

Beef production has passed through several marked changes since its inception as an important livestock enterprise in the United States. In its early development, wide variation existed in the type of cattle available and in the type of cattle acceptable for slaughter as beef. Then, with the wave of prosperity sweeping the country from 1870 to 1890, came the importation of many high quality, purebred beef cattle from Great Britain. This was closely followed by the stocking of the range and the development of the export trade in highly finished heavy, three-year-old steers as well as a demand for similar cattle from the large, rapidly industrializing cities of the East. This market, in turn, led to the development of the practice of bringing into the corn belt in large numbers from the range country thin two- and three-year-old steers and fattening them on corn before marketing. Then came the decrease in export demand for United States beef and a demand at home for a beef carcass of an entirely different character. Instead of the large, heavy, fat, somewhat wasteful carcass of the two- and three-year-old steer, a demand developed for the lighter-weight carcass of

the fat yearling or baby-beef steer or heifer. This simple change in market demand has caused more changes in breeding practices, feeding methods, and even in beef-cattle distribution over the country than any other factor operating in the last 40 years. Stated briefly, this change brought about and is still bringing about the establishment of many small herds of cows of beef type on the moderate-sized farms of the corn belt and surrounding territory, where it is found that a cow herd can be maintained with profit so long as her fat calf, steer or heifer, can be sold at from twelve to sixteen months old at a price from $20 to $50 more than can be obtained for a thin two-year-old steer off grass.

Maintaining the cow herd and raising calves and fattening them on the same farm is an enterprise admirably adapted to the average farm where such a rotation as corn, oats, hay; or barley, oats, hay, is used. On such a farm there is a supply of rough feed that can be utilized in maintaining the herd cheaply through the winter, and there is a supply of grain that can be utilized in fattening the calves, generally with grain enough left to grow and fatten a group of hogs also.

This continual increase in the number of small cow herds through the corn belt and the demand for calves instead of two-year-old steers from the range for fattening has made it difficult for many formerly profitable ranching areas to make the change. The result is that there has been a big decrease in cattle coming from the range during the last 25 years, and an increase in the number of small herds through the rest of the country.

## SPECIALIZATION ESSENTIAL TO PROFITABLE BEEF PRODUCTION

While the tendency toward the production of baby beef by the plan of maintaining a cow herd, raising calves and fattening them on the same farm is, perhaps, the most universal type of production now followed with beef cattle, several other types are well suited to certain areas and to certain farms in nearly any part of the country.

There are four lines of specialization in beef production, one of which any beef-cattle man should select according to the suitability of his farm, his equipment, and his personal qualifications. They are:

1. Breeding and fattening baby beeves.
2. Producing stocker, feeder, and grass-fat cattle.
3. Fattening purchased, thin cattle.
4. Breeding purebred cattle.

## RAISING AND FATTENING BABY-BEEF CALVES

Baby-beef production is the most intensive method of producing beef. It can be maintained profitably on many farms in the western and southern parts of Minnesota where acreages are large, where an enormous amount of rough feed is produced, and where labor is scarce. Baby-beef production lessens considerably the risk and trouble of feeding where only calves are fed. This type of production has the advantage, as a cow herd is maintained to utilize lands in permanent or tame grass pasture during the summer, and to market rough feeds, such as cornstalks, hay, fodder, and silage during the winter. In this way, a cow herd is maintained at a low cost while it provides a market for rough feeds, much of which would be unsalable. The calves represent the price paid by the cow for her maintenance.

Fig. 1. Thick, Compact Cows of Good Size Most Desirable for Producing Baby Beeves

On large farms, baby-beef production offers a solution for the labor situation, as a minimum of labor is needed in handling a beef-cow herd in summer and in the fattening of the calves after weaning as baby beeves in winter. This type of beef production to a large extent eliminates the financial risk existing in fattening purchased cattle. While the home-raised feeder calf represents a cost, quite a few of the cost items are items for which there has been actually no cash outlay. Figures gathered in the Minnesota Carload Baby-Beef Contest indicate that for several years it cost about $35 to produce a baby-beef calf to weaning age. More recent figures taken on the southwest Minnesota

statistical route show that a calf at weaning costs about $30 under present conditions. During those years, purchased calves of the same quality cost from $35 to $50. Most baby-beef feeders in this state are of the opinion that home-raised calves of like quality start on feed easier and finish more quickly than shipped-in calves.

**Selecting cows to produce baby-beef calves.**—For the most successful baby-beef production, cows showing beef breeding should be maintained. Preferably, the cows should be of medium to large size with a thick covering of natural flesh. Cows lacking in beef conformation, even when bred to bulls of good type, may produce calves so lacking in beef type as to be undesirable for raising baby beef. Even cows of desirable type, that is, those having good size with thickness, may produce calves that do not feed out satisfactorily. Such cows should be discarded and replaced with heifers from cows known to be producers of desirable feeding calves.

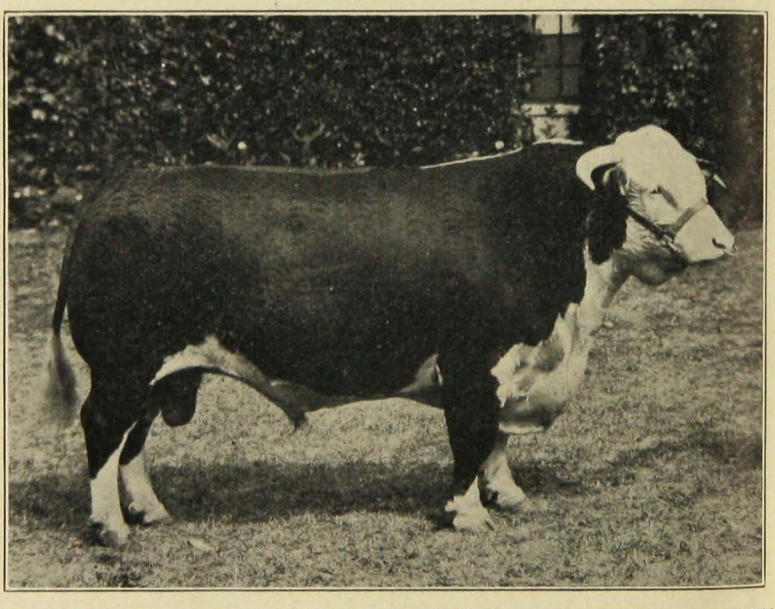

Fig. 2. A Desirable Type of Sire for Baby Beeves—Medium to Large, Compact and Thick

**Selecting the sire.**—From results of the Minnesota Carload Baby Beef Contest, it seems that the desirable type of bull to use for baby-beef production is one medium or large in size, having considerable thickness and quality along with scale. This type of bull sires calves that attain good weight at an early age, and at the same time put on a desirable degree of finish so as to command top prices on a good weight when sold.

**Shelter.**—A shelter for the cow herd may consist of nothing more than a shed that will provide a dry bed and protection from cold winds or rain. This protection can be supplied by a straw shed.

**Winter feed for the cow herd.**—The common way of wintering a beef-cow herd is to keep the cows in stalk fields, hay meadows, and pastures as late as possible in the fall, until the pasture is all used or covered with snow. Roughage may constitute the entire winter ration if the cows are in good flesh at the beginning of the winter. Corn silage and sweet clover or alfalfa hay and oat straw may constitute the ration. Corn fodder may be used to advantage. No grain need be fed except that received in silage or corn fodder. This utilizes the rough feeds that can not be used in feeding calves. In this way cows may be maintained at a low cost, will come through the winter in suitable flesh, and will give birth to good, strong, vigorous calves. The cows must be maintained economically or profits will be eaten up by the excessive cost of the calf resulting from the high cost of keeping the cow that raised it.

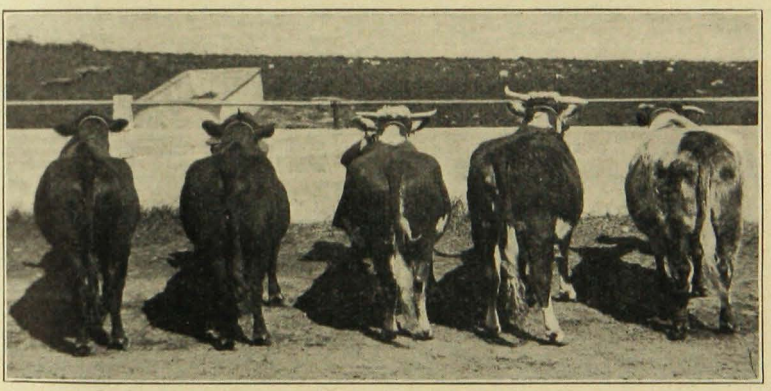

Fig. 3. Cows Like These Mated with Good Beef Bulls Produce Choice Feeder Calves

**Date of calving.**—Calves for baby-beef production are dropped, preferably, from March to June. March and April calving offers advantages as well as disadvantages. The early-born calf makes it possible to give the cow and calf more time and attention, and the cow on the winter ration will generally produce no more milk than the young calf can take. When calves are born after the cows go to pasture, the flow of milk may be more than they can readily take, with the risk of udder troubles. On the other hand, more and better housing facilities are required for early calving when the weather may be cold and inclement. With calves born on pasture, the cows can usually take care of themselves and have no difficulty in calving, and for that reason will need little attention.

Spring calving is more desirable than fall calving, when the cows are not milked and the calves nurse. The reason for this is that when calves are born in the spring the cows have been maintained on rough feed during the winter at a low cost. Besides, they are turned on pasture in the spring, which will supply an abundance of feed to stimulate the milk flow for the nursing calves. When calves are born in the fall, the cows require heavy grain feeding in order to supply the calves with the milk needed to make proper growth and development. This naturally increases considerably the cost of the calf by weaning time. When the cows are milked and the calves raised by hand, the situation is different. Such cows should calve in the fall so that the milking can be done during the months when labor is not needed for field work and when dairy products sell at highest prices.

**Pastures are important.**—An abundant supply of pasture is needed for the cows. This will keep them in good flesh, stimulate milk flow to nourish the calves properly, and supply grass for the growing calves. The kind of pasture is not so important if there is a good supply. It may be native bluegrass, or, if tame pastures are used, bromus and sweet clover, sweet clover alone, or medium red clover. With clovers, there is always the possibility of bloat, but if cattle are pastured continuously, cases of bloat are the exception rather than the rule. Sweet clover will continue to be an important pasture crop because of its large carrying capacity per acre.

After haying, the herd may be pastured in the meadows and stubble field. After corn picking, pasturing of the stalk field turns into a cash value a considerable amount of feed which would be otherwise wasted.

**Dehorning calves.**—All dehorning should be done in the early spring or late fall, in order to avoid trouble from flies. The operation should be done when the calves are about three weeks old. At this time the small horn buttons may be irritated by scraping with a knife blade and the growth of the horn stopped by the application of a caustic pencil that has been slightly moistened. The action of the caustic causes a scab to form over the irritated spot. This soon shrivels and drops off, and the horn growth is stopped. If dehorning is not done early, the operation should be delayed until after the fly season. It then becomes necessary to use a saw or clippers. In all cases the horns should be taken off, as this usually means less nervousness in the feed lot, larger gains, fewer bruises when the cattle go to market, and a better price by 50 cents or more per hundred pounds

**Castrating.**—All bull calves fed for baby beef must be castrated, preferably before fly time and when the calf is about four weeks old.

**Feeding calves in creep before weaning.**—Calves running with their dams on pasture should make as rapid gains as possible, as cheaper

gains can be made at this time than at any other. For this reason, good milk flow and good pasture are important. In addition to the milk and pasture it is advisable to feed some concentrates to the calves, separate from the cows. The grain may be conveniently fed in a creep near the watering place by providing a pen having an opening which the calves but not the cows can enter. Most farm grains are suitable for this feeding, as a liberal supply of protein is already furnished by the milk and the green pasture. A mixture of equal parts of shelled corn and whole oats is good for the purpose.

Calves that are fed in a creep while nursing will usually weigh 100 pounds more at weaning time than those not so fed. They will make this extra gain on about 300 pounds of grain, or will produce one pound of gain on 3 pounds of grain. It is impossible to produce a cheaper

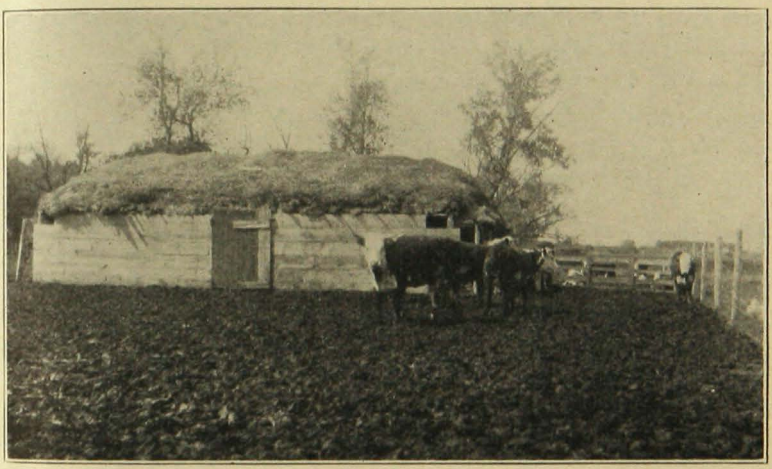

Fig. 4. A Cheap but Satisfactory Winter Shelter for Beef Cows or Fattening Cattle

gain than this at any other time in the life of the calf. Some producers keep the calves confined and turn the cows in twice a day to nurse the calves. The advantage of this method is that such calves are protected from the heat and flies and can be fed some grain in addition to the mother's milk, and make good gains. This, however, requires a little more labor than allowing the calves to run with the dams and may not be practiced where the herd is pastured some distance from the buildings.

**Raising beef calves on skimmilk.**—Baby-beef calves can be raised successfully by hand, if carefully fed. If they are not allowed to nurse the cows until old enough to wean, they should be given whole milk for two weeks and then gradually changed to skimmilk. They should be given grain from the time they will eat it. Oats is

satisfactory to start on, with corn added a little later. Then corn and oats will constitute the grain feed so long as the calf is receiving skimmilk.

Pail-fed calves are usually unsatisfactory to feeders because they are frequently thin in flesh, owing to insufficient and improper feed and carelessness in feeding, and the development of intestinal ailments. For this reason, in raising calves by hand the greatest care should be taken to keep the utensils absolutely sanitary and always to feed the skimmilk at the same temperature. In this way the digestive tract will not become unsettled and the calf should stay on feed regularly and make proper use of his feed. Hhe should have grain before him from the beginning in order to maintain his vigor and to make rapid gains. For such calves a self-feeder might be used to advantage. At University Farm it has been found profitable, in raising beef calves, to use a free-choice self-feeder in which corn, ground barley, ground oats, bran, and linseed meal are offered in separate compartments. Hand-raised calves can make rapid gains and be ready for market as finished baby beef at nearly the same age as a calf allowed to run with the dam during the summer.

**Feeding after weaning.**—Spring calves are weaned, usually, at the end of the pasture season, and are immediately put into the feed lot, usually about the first of November. The calves are put on a full feed of grain as rapidly as possible. Care should be used in starting calves on feed. A non-nitrogenous roughage, what they will eat, and two to three pounds of grain per head per day is sufficient. This can be increased about half a pound every other day until the calves are on full feed. While this change is taking place, it is well to change the non-nitrogenous hay to a legume hay, such as alfalfa or clover, making this change gradually, otherwise the calves may scour badly or bloat.

Oats are an excellent starting feed for calves. Oats may be fed as the sole grain for a few days, with corn or barley added as the oats are reduced, so that by the end of three weeks the ration consists of oats and corn, half and half. From then on the oats are reduced gradually. Once the calves are on full feed, oats should not constitute more than 20 per cent of the ration. More oats in the ration would reduce the gain and increase the amount of feed needed to make 100 pounds of gain, and probably would lower the finish of the cattle at the end of a given time.

Barley or wheat can replace corn in the ration. These two grains must always be ground for best results. It is desirable that a protein supplement be fed at the rate of a pound and a half per day per calf. This may be linseed meal, cottonseed meal, soybean meal, corn gluten

meal, or a combination of several of these feeds. This is especially true if corn silage constitutes a part of the roughage. Silage may be fed up to the latter part of the feeding period, but for the last third of the period it should be discontinued if the calf is to have a good finish.

In baby-beef feeding it is necessary to keep in mind that calves are primarily a means of marketing grain and not of roughage. Calves can consume only a limited amount of roughage to good advantage if maximum gains are to be obtained. When calves are on a full feed of grain, they will consume only about one-third to one-half as much roughage as grain by weight. A full feed of grain is the amount that a calf will clean up nicely twice a day in about an hour's time. The more accurate way, however, is to give each calf two pounds of grain per day, including the protein supplement, for each 100 pounds of weight. Sometimes it may be necessary to limit the roughage consumed in order to secure consumption of a full feed of grain. In fattening calves, it should be remembered that grain must be consumed if a finish is to be obtained, and finish determines the selling price. In estimating the amount of feed needed to fatten a lot of calves, it is safe to figure on 35 bushels of corn, or its equivalent in other grains, for each calf to be fattened. In addition to this, a pound and a half per day of linseed meal or some other protein supplement, about 700 pounds of a good legume hay, and some more common roughage will be required.

Steer and heifer calves may be fed together. However, in feeding a mixed lot, the steers outgain the heifers but the heifers fatten more quickly and are ready for market about six weeks earlier than the steers. It takes at least 200 days to finish a lot of baby-beef calves properly. The heifers are usually ready for market about 40 days earlier than the steers and it is well to sell them at that time rather than keep them until the steers are finished. If they are held, they are likely to become overfat and will then take a discount. If the mixed lot of steers and heifers is sold straight, the overfat heifers may pull down the price on the entire lot.

## PRODUCING STOCKER, FEEDER, AND GRASS-FAT CATTLE

The production of stockers, feeders, and grass-fat cattle at present is suited almost entirely to the range areas of the country. At least, it can be conducted, with advantage and profit, only on large tracts of cheap land where pasture and hay are about the only crops grown. To produce thin feeder cattle at a profit, and at a price that the fattener can pay and make a profit, requires that the cattle be produced at a low cost. This can only be accomplished where cheap feed, a

minimum of investment in working equipment, and a low labor requirement are possible. There are a few, but only a very few, tracts of land remaining in Minnesota that are suitable to this type of production. A thoro discussion of it here is not warranted, and readers interested in it are referred to publications given to a discussion of cattle-ranching methods. The marketing of calves from a herd of combined milk- and beef-type cattle is justified when there is little grain available or when the grain can be used to better advantage fed to milk cows or to hogs; also occasionally when feeder calves from beef-type herds can be marketed to advantage at weaning time and it might pay better to feed the grain to hogs.

## FATTENING PURCHASED CATTLE FOR MARKET

The fattening of thin beef cattle for market on corn, in the corn-belt area, is a practice that is as old as the growing of corn itself. One of the first extensive uses of corn, as its production developed in the now great corn-belt area of the country, was in the fattening of beef cattle, and this is still one of the most extensive means of marketing corn.

For many years, about the only plan followed in fattening cattle on grain was feeding corn and prairie hay, or corn, corn fodder, and some timothy or clover hay. Now the variety of feeds has been so extended as to include other crops and by-products, until we find thousands of cattle very successfully and profitably fattened annually without the use of any corn. Fall, winter, and spring are the favored months for cattle fattening. Cattle to be fattened are generally started on the fattening ration in the fall and early winter months. Among the reasons are: (1) Cattle eat better and make larger gains for the feed consumed during cool or cold weather when there are no flies to worry them than during hot weather and fly time. (2) Thin cattle suitable for fattening are offered for sale in largest numbers toward the close of the grass season. Generally, such cattle can be purchased more cheaply during the closing months of the pasture season than at any other time. (3) The farmer who chooses to purchase thin cattle and fatten them generally prefers to devote his labor during the cropping season to the production of feeds and then utilize labor during the winter for the care of the fattening cattle.

The general practice of fattening cattle through the winter sometimes leads to an oversupply of grain-fed cattle on the markets during the late winter and early spring and to a shortage during the summer and fall.

There is, therefore, an opportunity for some to benefit by planning to have their grain-fed cattle ready for market during the sum-

mer or fall. It is sound advice, however, to the beginner in the cattle-fattening enterprise, to get his first experience in fattening purchased cattle during the fall, winter, and spring, as fattening during this season is fraught with less risk and requires less skill than in summer.

Most cattle suitable for fattening, that are offered for sale in a thin condition, are produced in the range areas and are offered for sale in August, September, October, and November. To feed good cattle and get them on a buyer's market, they must be purchased in that period.

Fig. 5. Good Baby Beef Prospects
Well-bred thick-fleshed calves with good width and depth of body.

**Purchasing the feeders.**—Thin feeder cattle can be purchased in any one of several ways. The buyer may go to the ranch and purchase them directly from the producer. Comparatively few feeder cattle are purchased that way, however, because the seller has the advantage of having his cattle at home and can ask any price he chooses and the buyer may take them or leave them as he likes. The buyer, therefore, may have to do quite a little traveling and run up too large an expense account in getting the cattle he wants.

Throughout the range areas commission men list cattle that are to be for sale from ranchers and anyone wanting feeder cattle may order from them. The number obtained by this plan has been on the increase, but this method and the first mentioned combined have not provided a market for any large percentage of the feeder cattle of the country. As a consequence the great majority of thin feeder cattle

are shipped to the large central markets to be sold, and farmers go there or send orders there to purchase what they want. That such a large percentage of the feeder cattle of the country find their way to the fattening yards by this route is pretty good evidence that it is considered by most people the most satisfactory way of both disposing of and obtaining thin feeder cattle. In recent years, the development of producer-owned co-operative selling agencies offers an opportunity for the cattle fattener to use the service of such organizations in buying cattle on the markets or direct from the producer.

**Kind of feeders to buy.**—A question that is often uppermost in the mind of the cattle fattener is what "kind" of cattle he should buy. Many kinds of thin feeder cattle are to be found through the country and on the large markets. There are thin cattle in all stages of improvement through breeding from veritable scrubs to high-grade and even purebred cattle of the three beef breeds. There are steers and heifers of all ages, bulls, and cows, and all in various degrees of thrift, growth for age, and amount of fat carried. Generally there is money to be made in fattening any of these if they are bought right. In fact, getting value received for the money invested at the time of purchase of the thin cattle is of greater importance than the particular type or grade that is purchased. There are differences in the way cattle of the different kinds must be fed to have the largest profit from that particular kind. For instance, older cattle fatten in a shorter time than younger ones. Older cattle can utilize a higher percentage of roughage than young cattle. Older cattle make a larger daily gain than young cattle. Older cattle require a larger amount of digestible nutrients per 100 pounds of gain than young cattle. Heifers fatten more quickly than steers, but steers show a slightly larger daily gain than heifers. It is a good policy for the beginner to stick to the standard types of fairly well graded, two-year-old steers, yearlings, or calves of the beef breeds that will grade good to choice thin feeder steers.

**Feeds for fattening cattle.**—Because profit in fattening cattle depends largely upon the degree of success in feeding them and because the farmer himself is entirely responsible for the production, selection, or purchase of the feeds and for the method of preparing them and feeding, one of the items in cattle fattening that should have and does have the enthusiastic interest of the feeder is the feeding itself. The wide distribution of the practice of cattle fattening over the entire country during recent years has demonstrated that dozens of feeds, many methods of preparation, and many different combinations of feeds may be used successfully and profitably in fattening cattle. What feeds to use, how to prepare them, how to mix

them, and what quantities to feed must be determined separately for every group of cattle to be fattened. If home-grown feeds are to be fed, the farmer can simplify the problem by growing crops that will produce suitable feeds. Often, however, the question of what feeds are available will be the deciding factor in determining what should be fed. Again, comparative cash values or costs of feeds must be the deciding factor. To some extent the age, type, and grade of cattle to be fattened may determine the selection, preparation, and mixture of feeds.

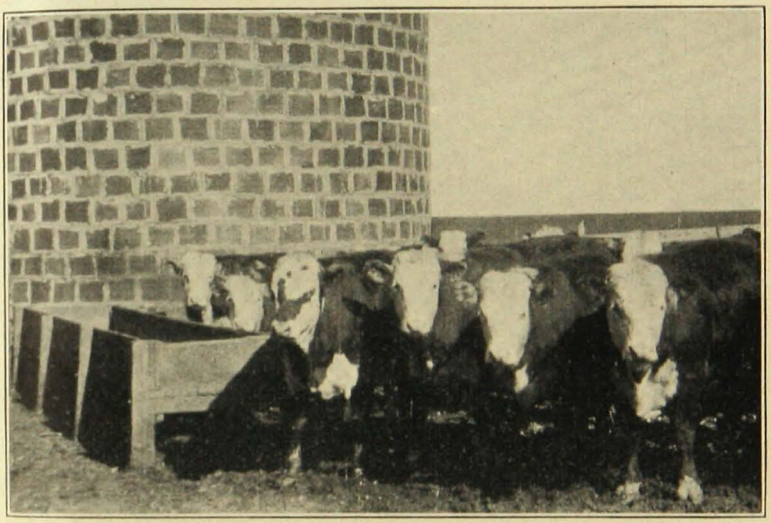

Fig. 6. Baby Beeves on Concrete Feeding Floor
Note the excellent type of bunk for feeding grain.

A few statements in a general way will apply with regard to compounding fattening rations. If a group of thin cattle that have just come off of grass are to be put on a fattening ration at once, there is no better way to start them than to feed prairie hay, timothy-clover hay, or corn fodder as the roughage for about the first week. At the same time, a mixture of one-half whole oats and one-half shelled corn or one-half ground oats and one-half ground corn, or one-half ground oats and one-half ground barley, should be fed as the starting grain. While the cattle are becoming accustomed to grain, they should have all the roughage they care to eat. Calves should be started on not more than 2 pounds of grain per head per day; yearlings, on 3 pounds, and two-year-olds, on 4 pounds. The amount of grain can be increased at the rate of a half pound per head every other day for calves and every day for yearlings and two-year-olds for about the first ten days. After that increases may be made a little more slowly and the percentage of oats in the mixture reduced gradually until in

ten days more the oats will be eliminated and the total amount of grain raised to nearly a full feed. While oats are excellent for starting cattle on feed because they are not a good fattening grain, their use should be limited to not more than 25 per cent of the ration or none at all, after the cattle are well accustomed to eating grain.

If alfalfa or sweet clover hay is to be used in the fattening ration, one feed per day of either may be given after the cattle have eaten prairie hay, timothy, or corn fodder for about a week. By the end of the second week, two feeds of alfalfa or sweet clover hay per day may be given, eliminating the non-leguminous roughage. If corn silage is to be fed, it may be given from the beginning, feeding small amounts at first and gradually increasing to 10 to 15 pounds a day for calves, 15 to 20 pounds for yearlings, and 20 to 25 pounds for two-year-olds.

If a protein supplement is to be fed, it may be given any time after the first week of feeding. It is desirable to start with not more than a half pound per head per day of any of the standard protein supplemental feeds, such as linseed meal, cottonseed meal, corn gluten meal, or soybean oilmeal, and to increase the amount gradually to 1½ or 2 pounds per head per day by the time the cattle have been on feed six weeks.

The question is often asked, "How can one tell when a group of fattening cattle have reached a full feed of grain or approximately a full feed?" This can readily be detected by an experienced feeder through the behavior of the cattle, but it is not so easy for the inexperienced feeder. When some animals begin to leave the feed bunk before the feed is all cleaned up, the entire group is getting just all the feed they can handle. As just a little less than a full feed of grain is generally more profitable than self-feeding or "full" feeding, it is good practice to feed no more grain than will be just about cleaned up by the time the first animals begin to leave the feed bunk at each feeding time.

Space will not allow a complete discussion of the feeding of fattening cattle. This discussion of starting cattle on feed was presented because this part of the feeding period is so important and because so many mistakes are made at this time. Hundreds of questions arise about the feeding of fattening cattle. Answers to a few of them may be found in the following statements:

A few rations highly satisfactory and commonly available for fattening cattle in Minnesota are:

1. Shelled corn, full fed
   Linseed meal, 1½ pounds per head daily
   Alfalfa hay, full fed
   Corn silage, full fed

2. Shelled corn, full fed
   Linseed meal, 1½ pounds per head daily
   Alfalfa hay, full fed
3. Ground barley, 85 per cent; ground oats, 15 per cent, full fed
   Linseed meal, 1½ pounds per head daily
   Alfalfa hay, full fed

1. If pigs can follow fattening cattle receiving corn, it matters little whether the corn is fed as ear corn, shelled corn, ground ear corn, or ground shelled corn.

2. All small grains, such as oats, barley, wheat, and rye, should be ground before feeding.

3. It is generally profitable to add a protein supplement to any ration composed entirely of farm-grown feeds.

4. It is especially important to feed a protein supplement when corn silage is extensively fed or when prairie hay, timothy, or corn fodder comprises the only roughage.

5. The grinding of roughages of good quality for fattening cattle is of doubtful value.

6. The feeding of molasses when a plentiful supply of farm-grown grains is available is of doubtful value.

7. When wheat is equal in price, bushel for bushel, with corn, it can be used for fattening with results about equal to those secured from corn. Wheat is best fed as a part of the grain ration only.

8. Ground barley may be used as the only grain for fattening cattle but usually with results a little less satisfactory than when corn is fed.

9. Salt in some form (either as block salt or flake salt) should be before fattening cattle at all times.

10 The problem of supplying minerals that may be needed by fattening cattle can be satisfactorily solved by placing some animal-feed bonemeal in a protected small box where the cattle can get what they want. Do not add bonemeal or any mineral mixture to the salt or grain ration.

Many modifications of these rations can be made and good gains with good profits still be obtained. For more extensive information on the selection of rations and methods of feeding fattening cattle readers are referred to Bulletins 237, Rations for Fattening Baby Beeves and Selection of Calves for Baby Beef Production, by H. W. Vaughan[1],

[1] Out of print.

and 274, Grinding Shelled Corn, Barley, and Alfalfa Hay for Fattening Cattle; Feeding Cane Molasses to Fattening Cattle; Peat-Land Hay as Roughage for Cattle, by W. H. Peters, of the Minnesota Agricultural Experiment Station.

**Shelter for fattening cattle.**—The problem of shelter and equipment for a group of fattening cattle even in cold weather is one that is easily solved and does not require a large expenditure in proportion to the total investment in the cattle and feeds. Any simple, cheaply constructed shed that will afford protection from wind, snow, and cold rains, and that is kept comfortably bedded with straw, is just as suitable as the most expensive type of building that could be constructed, so far as the welfare of the cattle and the rate of gains are concerned.

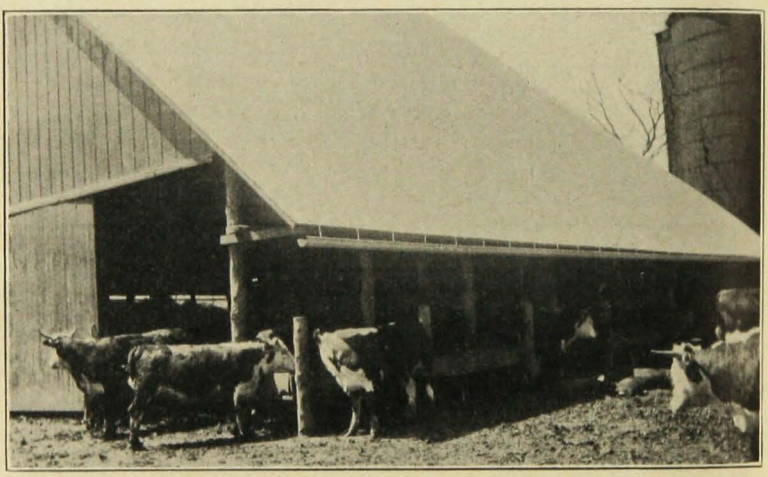

Fig. 7. A Handy Cattle Feeding Shed with Hay in the Center

Fattening cattle produce in their bodies much more heat than can be utilized. This surplus heat must be expelled from the body. It is essential, therefore that they be kept cool rather than warm. Likewise, simply constructed feed bunks for grain and racks for hay are satisfactory, the important object being to make sure that there is enough space at the bunks and racks to permit all cattle to eat comfortably at feeding time.

**Time to market fat cattle.**—While the price received for fat cattle when marketed is an even more important factor in determining profit than the price paid for the thin cattle when purchased, the marketing of fat cattle is not so hard a problem and need not cause the cattle fattener as much worry as purchasing the feeders. It has been demonstrated many times in experimental work as well as in practice on farms that the most profitable plan of marketing is to get the cattle in that degree of finish or fatness that will best suit the packer-buyer

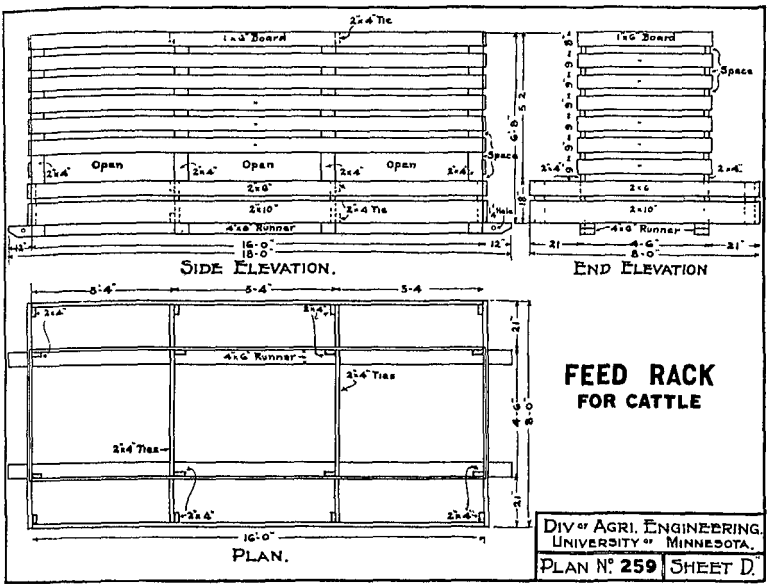


Fig. 8. Plan of a Portable Hay Feeding Rack for Cattle

for the class and grade of cattle being fattened and then send them to market as soon as that stage has been reached. Fat cattle are generally sold to best advantage by consigning them to a co-operative selling agency or a reliable commission firm, to be sold on a central market. Occasionally cattle in an unfinished condition may be sold to greater advantage than by keeping them until fully finished and, once in a while, money can be made by holding them even after the cattle are fully fat, but about nine times out of ten when the fattener tries either one of these two plans he is the loser.

**Summer fattening.**—Fattening cattle through the summer and early fall by keeping them in a dry lot with good shade, as well as fattening by feeding grain on pasture have been followed in a limited way for many years with a fair degree of success and sometimes with highly satisfactory profits, but slow and expensive gains through the hot summer months, when the flies are bad, have discouraged extensive development of summer fattening. For this reason grain-fat cattle are generally somewhat scarce and command a premium on the market from about August to December. The experienced cattle feeder who has a suitable pasture and is well equipped with shade for the cattle may find summer fattening by feeding grain on grass a profitable enterprise. Likewise, the cattle fattener who has gone to the expense of providing equipment better than average for winter fattening may find it to his advantage to keep this equipment working the year round rather than in winter only. If one plans to practice

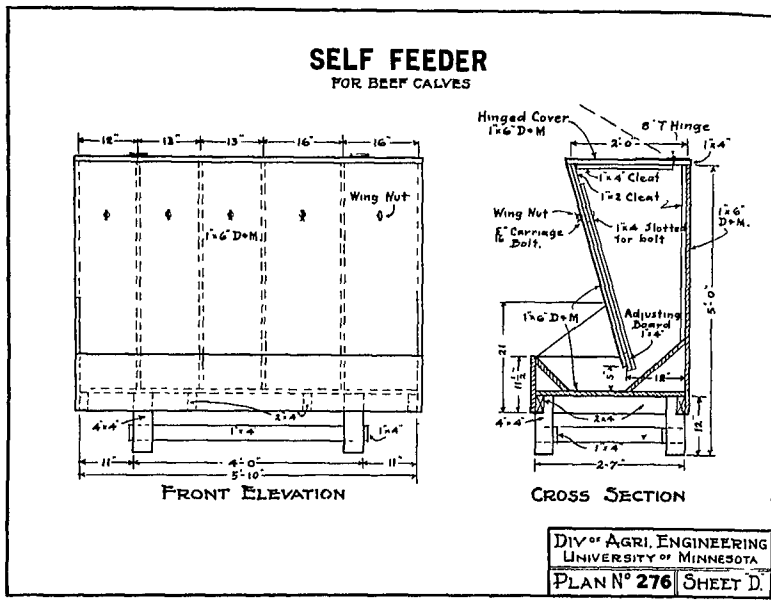


Fig. 9. A Free-Choice, Five Compartment Self-feeder For Calves

summer fattening it is desirable for him to breed his own cattle or buy thin cattle late in the preceding fall and carry them through the winter on roughage only, for generally thin cattle suitable for fattening are scarce and high priced in the spring. Anyone who has carried thin cattle over winter generally has done so because he has grass for them to run on and expects to carry them through the summer also, and will sell in the spring only at an attractive price.

## MONTHLY TRENDS IN CATTLE PRICES

A study of Figure 10 reveals some interesting and important facts concerning monthly trends in fat cattle prices. It is clearly seen from this chart that August, September, October, and November are the months during which the highest prices for the two top grades of fat beef cattle are secured on the Chicago market, while March, April, May, and June are the high months for fat cattle of the two lower grades.

Figure 11 shows the monthly average prices for feeder and stocker steers on the South St. Paul market for the period 1924-31. From this chart it is seen that the high-price period for stocker and feeder cattle comes during the first six months of the year and the low-price period during the last six months. While the experience of the past may not be repeated in the future, it is probable that to a marked extent it will be and that the experienced feeder may study both the above charts and act accordingly in selecting the time to purchase feeder cattle, the

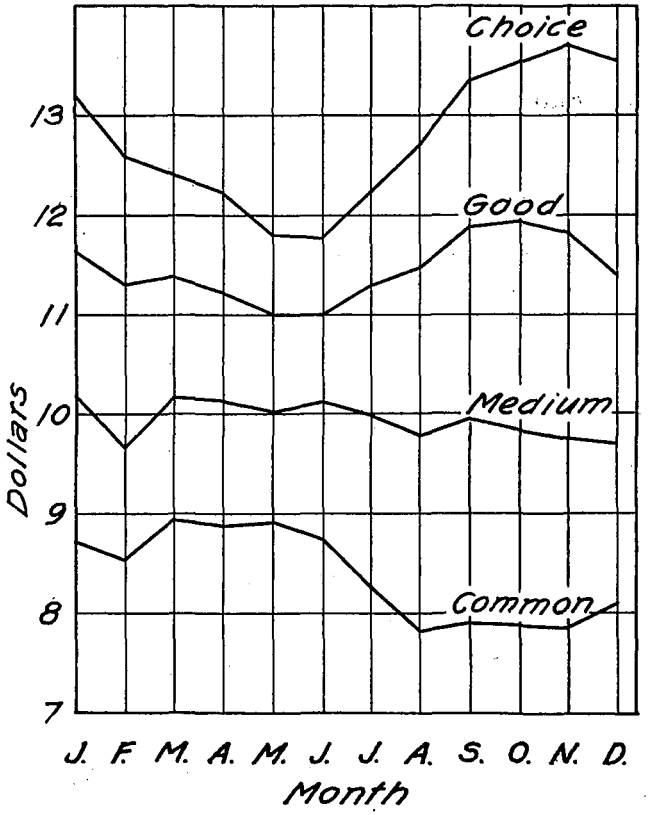


Fig. 10. Monthly Average Prices of Beef Steers by Grade, All Weights—Chicago, 1924-31, Inclusive

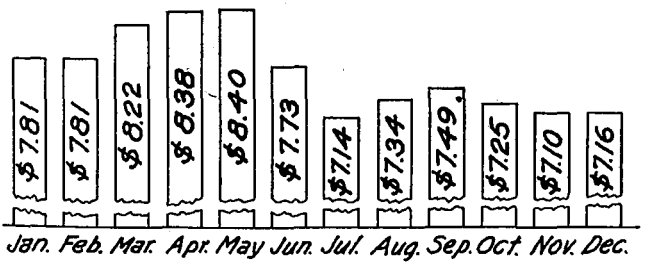


Fig. 11. Monthly Average Prices of Feeder and Stocker Steers South St. Paul, 1924-31. Inclusive

quality of cattle to purchase at a given season of the year, and the time to market fat cattle.

## BREEDING PUREBRED BEEF CATTLE

The beef-cattle industry in the United States is indebted to the early improvers of cattle in Great Britain for much of the prosperity that it now enjoys. Early improvement of cattle in the United States was accomplished largely by the crossing of bulls of the Shorthorn, Hereford, and Angus breeds, imported from Great Britain and mated with cows of all descriptions in this country. Imported cows of these three breeds formed the foundation of the many herds of purebred beef cattle now found throughout this country. In their progressive way, American breeders soon developed purebred herds that could no longer be improved to any considerable extent by further importations, and the leading breeders of purebred beef cattle of the United States are now able to supply breeding stock equal to that of any other country, and in some cases superior.

The breeding and marketing of purebred cattle is the most highly specialized type of beef-cattle production. Consequently it should be undertaken only by men who have had experience in raising or handling the market types of beef cattle or by men who have had special training for managing a purebred beef-cattle enterprise.

A herd of purebred beef cows carefully selected and purchased at moderate prices or developed for several years from a small beginning may profitably be used for the production of calves to be marketed directly for slaughter. Generally, however, the breeder of purebred beef cattle has in mind the production of bulls good enough to sell as sires for use in other purebred herds or grade herds, and the production of females good enough to be in demand as brood cows in other purebred herds. Such animals generally sell at prices considerably above their actual immediate market value as beef and thus offer an opportunity to the breeder for a larger net return from each animal raised than can possibly be secured in raising cattle for immediate slaughter.

The essentials to success in the breeding of purebred cattle are: (1) A liking on the part of the owner for the type of work required in developing beef calves. (2) Sufficient ability on the part of the owner in the type of work required to assure success in the raising and care of good cattle. (3) A thoro understanding and appreciation of the importance of taking the necessary precautions to maintain in the herd health, thrift, and freedom from contagious diseases. (4) A thoro appreciation and knowledge of the problems involved in selling purebred livestock, so that successful salesmanship may be developed as the herd is developed.

The breeding of purebred beef cattle has been an enterprise affected by wide variation in profits. At times, demand and prices have been so strong as to bring extraordinary profits; at other times, purebred beef cattle have had to be disposed of on the beef market; and as with many other commodities, the present-day tendency seems to be toward a better realization on the part of all concerned as to just what is the value of purebred beef cattle for use as breeding stock, and there is a tendency toward the establishment of somewhat more stable values.

There will continue to be a good demand for a limited number of purebred beef cattle of the three important breeds for the immediate future, at least, and any farmer who gets enjoyment as well as financial profit from keeping good purebred beef cattle on his farm may produce them with confidence that the enterprise is fully as promising as many other production enterprises on Minnesota farms.

## IMPORTANT CATTLE DISEASES

From the standpoint of successful livestock production of any type, the prevention of loss by disease is probably the most serious problem of the day. It is natural that as animals become more numerous, diseases of a communicable type become more prevalent. Science has developed methods of preventing and combating most animal diseases. These methods are effective in eradicating and preventing the recurrence of such diseases in a herd if the necessary practices and precautions are intelligently, carefully, and completely carried out.

Beef cattle, as a type of farm livestock, probably because so much of their time can be spent outdoors, are comparatively free from diseases causing heavy losses. Even so, there is no form of beef cattle production that can be entered into with promise of success without the most careful attention to sanitation and precautions for the prevention of loss by disease.

**Tuberculosis.**—Tuberculosis is probably the most widespread of any communicable disease of cattle in the United States. While the disease itself, its methods of communication, and a cure for it are not yet any too well understood, a plan for the eradication of the disease from a herd and the prevention of its recurrence has been satisfactorily developed.

The beef cattle man can do no better than to carry out completely and carefully the necessary procedure of having his cattle tested for the disease, of disposing of reacting animals, and of introducing into his herd only animals that have been properly quarantined and tested. Following this plan may not prevent an occasional recurrence of tubercular animals in the herd, but the plan has been practiced in many herds for many years with a high degree of success. The plan of testing all cattle in a county with a view to the possible final elimination of the

disease from the entire country is progressing rapidly and with fair promise of final success.

**Abortion.**—Next to tuberculosis, contagious abortion is probably the cause of more concern among cattle raisers than any other disease. While still less is known about the cause and method of transmission of this disease than those of tuberculosis and no cure has been developed, a plan for eliminating it from the herd and preventing its recurrence has been made possible by the development of a reliable method of testing cattle for the disease. It will be to the final financial advantage of every cattle raiser to have his herd tested for the presence of abortion disease, then to dispose of the reactors and endeavor to prevent recurrence by quarantine and testing new animals before they are added to the herd. It is seldom, if ever, true that a herd of cattle containing abortion-reacting animals will become free of the disease except by removing the reacting animals from it.

**Other diseases.**—Foot and mouth disease, blackleg, anthrax, and hemorrhagic septicemia are other diseases of cattle that seem to be contagious. They appear generally in limited areas and require special efforts to stamp them out. Aside from handling tuberculosis and abortion as outlined, the cattle raiser should keep careful watch of his herd for the appearance of symptoms of something wrong, and, when symptoms are noted, call in a competent veterinarian for diagnosis and treatment of the trouble. Many other minor troubles in the form of disease or derangement of normal functioning of the digestive and reproductive systems arise to require skilled attention to each case.

**Parasites.**—Fortunately cattle thus far have escaped the ravages of any seriously destructive internal parasite, as the roundworm of pigs and the stomach worm of sheep. Two common external parasites, however, lice and ringworm, frequently require attention.

Lice are easily eliminated in spring, summer, and fall by washing the animals infested with any one of the many standard stock dip solutions that are available. An infestation of lice appearing during the winter months may be held in check by dusting the animals along the back with a dry preparation of one-half powdered sabadilla seed and one-half flowers of sulphur.

Ringworm is eliminated by rubbing off the coarse cheeselike scab that it forms and painting over the spot with tincture of iodine. Ringworm should be treated without delay because if the infestation is allowed to spread throughout the herd it becomes very stubborn and progress in eliminating it is very slow and tedious.

**Warts.**—Seedlike warts on the skin of cattle seem to be occuring with increasing frequency. They can usually be removed in the course of a few weeks by an application every two or three days of some soft oil—sweet oil or cottonseed oil.