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BEEF PRODUCTION

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Summary

The growing of beef steers and heifers to the yearling or two-year-old age before fattening, then fattening through a short feeding period with the minimum amount of grain necessary to produce beef that will grade good, is recommended as a temporary wartime procedure.

The purpose of this procedure in production is to maintain the largest possible volume of production from grass and forage and conserve as much grain as possible for milk cows, hogs, and poultry.

In normal times, maintaining a cow herd, raising calves, and fattening them as baby beefs on the same farm is an enterprise admirably adapted to many Minnesota farms.

Although in baby beef production it is considered good practice to allow the calves to nurse their mothers, it has been demonstrated that calves raised on skim milk can be successfully and profitably fattened for market as baby beef.

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

The plan of specialization in which beef calves are sold as stocker and feeder or grass-fat cattle is limited in adaptation to large acreages of low-cost land and to range areas.

The purchase of thin cattle and fattening them through the winter months is an enterprise suited especially to the farm on which all of the land is adapted to cultivation and when there is an advantage in having all of the available labor employed in crop production in summer.

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

The selection of feeds to be grown and the giving of feed according to the needs and purpose for which the animals are being fed require the exercise of good judgment and skill if the beef cattle enterprise is to be successful and profitable.

BEEF PRODUCTION

W. H. Peters and W. E. Morris

THE immediate wartime need for the largest quantity of beef that can be produced from the number of cattle and the feed supply available, rather than for the highest quality of beef, has modified temporarily some of the practices formerly recommended to beef cattle producers. Fundamental principles of breeding, care, and marketing remain the same. It is only in management and feeding that appreciable changes are recommended for the duration of the war.

BEEF CATTLE can be grown largely on grass, hay, and silage. By keeping calves on their home farms and ranches until they are 18 months to two and a half years old, then fattening them on grain for three to four months instead of the usual six to nine months, the volume of beef can be maintained or increased, and a great deal of grain and concentrate feed saved for feeding to hogs, poultry, and dairy cattle, where it will yield a greater quantity of human food.

Formerly, many farmers who maintained cow herds preferred to put the calves on a full feed of grain at weaning time and have them ready for market weighing 850 to 1,100 pounds at 14 to 20 months old. Many ranchers preferred to keep larger cow herds and sell the calves as feeders at weaning time weighing 400 to 500 pounds. These calves would be purchased by specialized fatteners and be made ready for market in six months to a year, so that they, too, would go to market as fat yearlings, the same as the calves produced in the farm herds, and at about the same weights.

The production of fat yearlings was the plan that proved most profitable to many farmers, ranchers, and specialized fatteners so long as corn, small grains, and protein concentrate feeds were available at moderate cost and quality beef sold at a premium. The ceiling price placed on choice to prime beef, and the growing scarcity and rising cost of corn, grain, and concentrate feeds, were the factors that suggested a change in beef production methods for the duration. The plan of growing calves to older ages before fattening, and then fattening them with less concentrate feeds, requires considerable change in the cropping plan and in the equipment on the specialized beef cattle farm or ranch. Some producers regard the risk of making the change as too great and have either continued under the former plan, reducing their volume somewhat, or discontinued their beef cattle enterprise for the duration. Most beef producers, however, are attempting to make the suggested changes in management and feeding for the present, intending to go back to their former production plan as soon as war-

time needs and restrictions are removed. In revising this bulletin at this time, therefore, it is deemed advisable to present the opportunities and problems of beef production from the long-time viewpoint. Temporary changes that seem desirable in conforming to wartime needs will be inserted. From either the wartime or long-time viewpoint, beef production may be divided into four lines of specialization from

which the beef producer should choose according to the suitability of his farm, his equipment, and his personal qualifications. The four lines of specialization are:

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

BREEDING AND FATTENING BABY BEEVES

BABY BEEF production is the most intensive method of producing beef. It is most profitable on fertile farms of moderate to large acreage where large amounts of both rough feed and grain are produced and where labor is scarce. In baby beef production the cow herd is maintained on pasture during the summer, and largely on cornstalks, hay, straw, and silage in winter. The cow

herd provides a market for the pasture and unsalable rough feeds. The calves at weaning time represent the value returned by the cows for their maintenance.

On large farms, baby beef production will often solve the labor problem, especially in summer while cows and calves run together on pasture and require very little attention. This type of beef



FIG. 1. Thick, compact cows of good size are most desirable for producing baby beefs

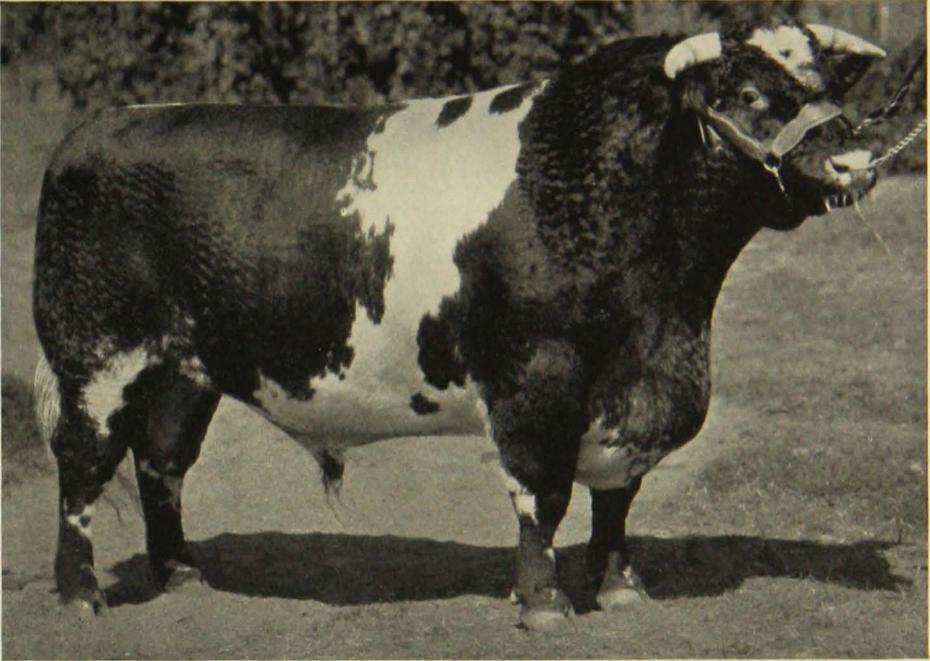


FIG. 2. A desirable sire for producing baby beefs—large, compact, and thick

production eliminates some of the financial risk involved in fattening purchased cattle. Most of the cost of the home-raised feeder calf is made up of items requiring no cash outlay. Many baby beef feeders express the belief that home-raised calves of like quality start on feed more easily and finish more quickly than shipped-in calves.

Selecting Cows to Produce Baby Beef Calves

For most profitable baby beef production, the cows kept should show beef breeding and should be of medium to large size with a thick covering of natural flesh. Cows lacking in beef conformation, even when mated to good beef bulls, may produce calves so lacking in beef type as to be unsatisfactory for fattening as baby beefs. In any large herd, there are likely to be some cows whose calves fail to fatten satis-

factorily. Such cows should be replaced with heifers from cows known to produce desirable feeding calves. Generally higher prices make the present time especially opportune for culling old and inferior cows in beef cattle herds and replacing them with heifers from the better cows.

Selecting the Sire

Observations on many beef cattle farms indicate that the bull used for baby beef production should be of medium size, and have considerable thickness and quality. He should be a pure-bred of any well-established beef breed. Calves from such a bull will grow rapidly while young and fatten at any age.

Shelter

A suitable shelter for the cow herd in baby beef production may be nothing more than a shed good enough to

provide a dry bed and protection from cold winds or rain. Many farmers use straw sheds.

Winter Feeds for the Cow Herd

In the northwest, the winter feeding period for the baby beef cow herd begins around November 1. At this date most of the calves reach weaning age and are separated from the cows. From then on, the cows should be fed in a group and the calves housed, yarded, and fed separately. Often the cows may graze over hay meadows or cornstalk fields through most or all of November until the first heavy snow. They can then be wintered on whatever type of roughage the farm produces to greatest advantage. This may be largely sweet clover or alfalfa hay, native prairie hay, timothy and clover mixed hay, straw, corn fodder, corn silage, or any of several less common roughages. Usually several such feeds

will be used during the winter. A 50-50 combination of a legume hay and any of the nonlegume roughages available is recommended. The most successful baby beef producers consider two tons of dry roughage, half of it legume hay, to be the minimum winter supply necessary for each mature cow. Two thirds of the hay supply may be replaced by silage at the rate of two and a half tons of silage for a ton of hay. Only old cows or cows nursing calves through the winter may need a little grain in addition to the roughage.

Pastures

Profitable baby beef production depends largely upon the efficient use of pasture for the cow herd through the longest possible grazing season each year. Most baby beef farms have at least a moderate-sized permanent pasture to provide grazing at the earliest possible date in the spring. Even so,

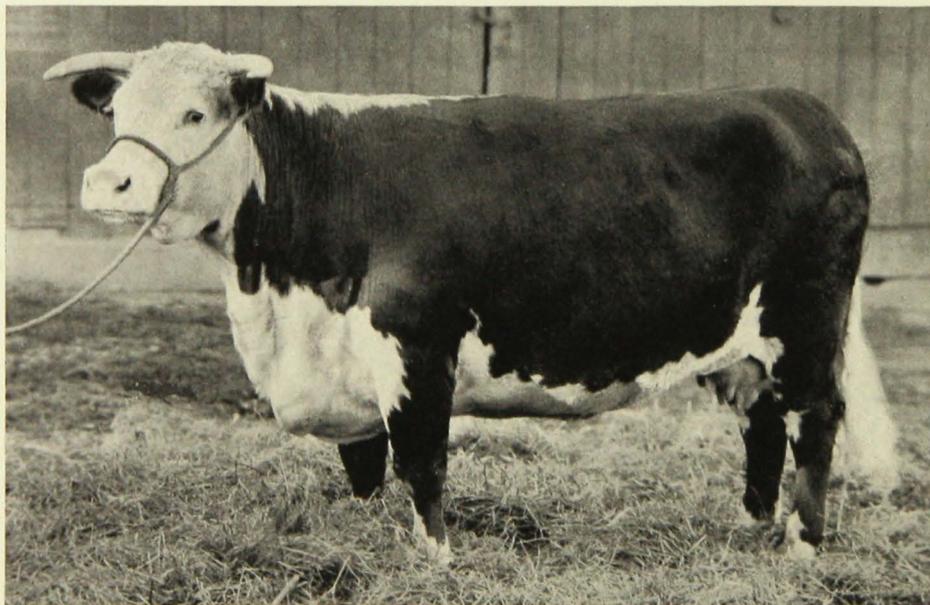


FIG. 3. Typical of the form, size, and flesh covering desired in the cow for baby-beef production

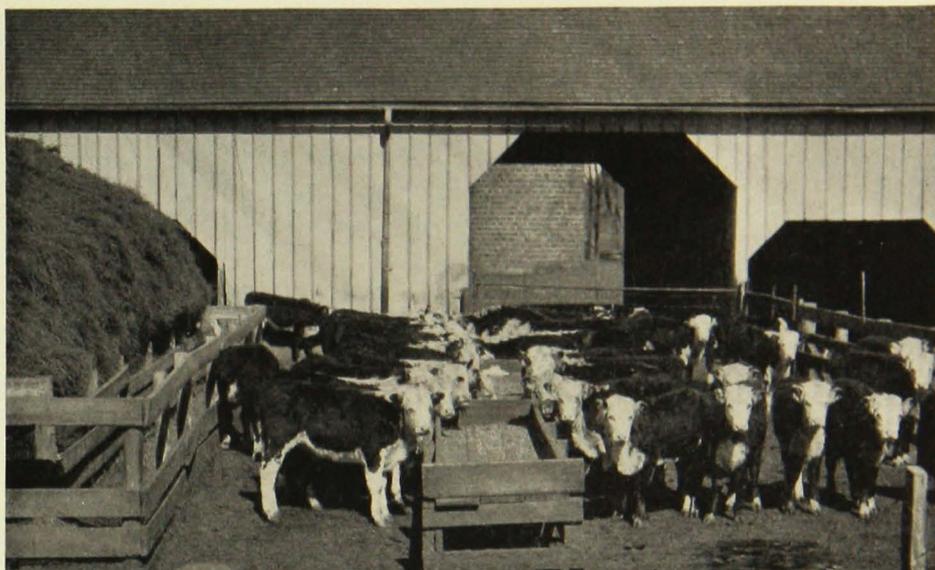


FIG. 4. Suitable equipment and suitable calves for producing choice baby beefs

it is a mistake to turn the cow herd onto such a pasture until it has a growth of about four inches. Such permanent pastures give best results when so stocked that they will provide abundant feed until the dry hot weather of midsummer begins. A temporary pasture of sweet clover or Sudan grass should then be available for about six weeks while the permanent pasture rests and gets ready for the cattle again by about September 1. The permanent pasture may often be supplemented in the fall by pasturing the cows for short periods on harvested fields that have a good growth suitable for grazing.

Date of Calving

Most baby beef producers in the northwest prefer that the calves be born during the spring months, March to June, so they may be weaned when winter feeding of the cow herd begins. Dry cows may be wintered on cheaper feed and less feed than cows nursing calves. Spring-calving, pasture-fed

cows also give much more milk for their calves than cows nursing calves through the winter months.

If dual-purpose cows are used for producing the calves, they would be hand-milked and the calves raised on skim milk. In this case, the cows should calve in the fall, so the milking can be done during the months when the labor is not needed for field work and when dairy product prices are usually highest.

Mating the Cows

Twenty to 30 cows can be bred satisfactorily by allowing the sire to run with them in the pasture. If cows are to begin calving in March, the bull would be turned with the herd June 1. Most farmers prefer that no calves arrive before April 1 and in this case the bull would be turned with the herd July 1. For pasture breeding, the bull should be two years old or older. If a younger bull must be used, or if more than 30 cows are bred to one

sire, the bull should be kept away from the herd, given special care, and the cows mated as they appear in heat. Success in baby beef production will depend very largely upon the type and merit of the sire and on the percentage calf crop secured each year. Spending a few dollars more for a better sire and giving a little more attention to getting the cows in calf would have increased the profits from many baby beef herds that the writers have observed over a period of years.

Castrating and Dehorning the Calves

All bull calves should be castrated, preferably when three to four weeks old. All calves to be fattened should be dehorned. This can best be done with caustic when the calf is a few days old. The small, soft horn button is rubbed with a stick of moistened caustic potash until the caustic has cut in deeply enough to make the surface red and moist with blood. One such treatment will kill the horn. Many cattlemen prefer not to bother with dehorning until fall and then dehorn all calves at the same time with a dehorning clipper. This method is preferable under range production, or where a large herd makes dehorning with caustic inconvenient. Dehorned calves always appeal to the buyer. Many buyers will pay 25 to 50 cents per 100 pounds more for dehorned feeder calves than for horned calves. Likewise many buyers of fat cattle will pay slightly higher for dehorned cattle because they know there will be no horn bruises on the carcasses.

Creep Feeding Calves

While it is common practice to allow baby beef calves to remain with their mothers on pasture throughout the grazing season without supplemental feed, many producers prefer to creep-feed grain to the calves through the latter half of the nursing period. Creep

feeding is accomplished by building a small enclosure near the watering place with several openings just large enough for the calves to get through and with a trough or self-feeder inside for grain. Calves soon learn to enjoy a feed of grain whenever their mothers come to the water tank. Sixty per cent shelled corn and 40 per cent whole oats is a very suitable grain mixture to feed the calves. Most any mixture of ground grains, such as one-half barley and one-half oats, or a mixture of corn, wheat, and oats, or wheat, barley, and oats will be satisfactory. Since the calf gets some protein from his milk and some from the grass he eats, a protein supplement is not essential during creep feeding. Usually the creep-fed calf will weigh 100 pounds more at weaning time than the calf raised without such extra feed. About 300 pounds of grain will be consumed to produce this extra 100 pounds of growth, which will, therefore, be about the cheapest 100 pounds of gain that can be put on a beef animal at any time during growth.

Raising Beef Calves on Skim Milk

Baby beef calves can be raised successfully on skim milk. If the producer has cows of beef breeding he will seldom elect to milk them. On the other hand, many farmers prefer dual-purpose cows and some dairymen prefer to mate at least part of their cows to a beef bull. In either case, the cows are usually milked and the calves raised on skim milk. The calf to be raised on skim milk should nurse its mother for three or four days, then receive whole milk until two weeks old, and then be changed over to skim milk, taking one week's time and gradually replacing the whole milk with skim milk. Such calves should receive about two and a half gallons of skim milk per day until about six months old. They should be given grain and hay as soon as they will eat

it, usually at four to five weeks of age. Oats, or a mixture of oats and bran, is satisfactory as the starting grain, with some corn or barley added a few weeks later. When the calf is three months old a protein supplement equal to 10 per cent of the grain ration should be added. It is probable that the skim milk calf will get along best if fed grain twice a day and limited to a little less than he would eat. Most men experienced in raising calves on skim milk prefer a good quality nonlegume roughage to alfalfa or any other legume roughage so long as the calves are receiving skim milk. Most of them also prefer to keep the calves off pasture so long as they are receiving the skim milk.

Feeding After Weaning

In typical baby beef production it is assumed that the calf will be started on the fattening ration immediately after weaning. It is recommended especially that creep-fed calves and skim milk calves be continued on grain following weaning. Otherwise they will lose their calf fat and take more time to get ready for market. They should be gradually changed over to the heavier fattening grain ration and at least

half of their roughage should be legume hay. A fattening period of seven to nine months is normal to fully finish baby beef calves. Thus the typical farm-raised baby beef steer or heifer will be 13 to 18 months old when ready for market and should weigh 800 to 1,100 pounds.

Range-raised calves purchased as baby beef feeder calves at weaning time usually have not been creep fed. If started immediately on the fattening ration they must be started on a small amount of a light, bulky grain ration and gradually worked up to a full feed of grain in about a month. Detailed information on the feeding and fattening of the baby beef calf following weaning is given in the section on Fattening Purchased Cattle.

While it is recommended as a war-time measure that in so far as possible all beef cattle should be grown to heavier weights on grass and roughage before being marketed, the farmer in Minnesota who has a herd of cows and is equipped on a rather permanent basis to produce baby beef will undoubtedly find it to his advantage to get back into baby beef production as soon as quality beef is again allowed to sell without ceiling prices.

PRODUCING STOCKER, FEEDER, AND GRASS-FAT CATTLE

THE production of stockers, feeders, and grass-fat cattle is suited especially to the range areas. In Minnesota it can be conducted to advantage only on large tracts of cheap land where pasture and hay are about the only crops grown. There are a few such tracts in the state, but on most farms, even of large acreage, there is usually enough land suited to cropping to raise the grain for fattening the calves.

Cattle are marketed as stockers, feeders, or grass-fat cattle from ranches only because it is not profitable to grow feeds for fattening on the range

lands. Prior to World War II, a good many ranchers were finding it profitable to market their calves as feeders at weaning time, thus being able to keep larger cow herds and raise more calves. Other ranchers had found that the feeder calf did not bring enough money at weaning time to pay for keeping the cow and that the calf had to be carried to the yearling age and weight before he could be sold at a profit. Still others found that their profits were largest if they kept the calves over their second winter and sold them in the fall at two and a half

years of age. In this case some of the cattle are usually fat enough when marketed to sell for slaughter.

The factors determining the age at which the range-raised calf can be marketed to best advantage are principally the climate and length of the grazing season. These two factors indirectly influence the cost of keeping the cow and the weaning weight of the calf. In the north the long winter season contributes to high cost of maintaining the cow herd while the late calving and short grazing season limit the weight of calves at weaning time. In Minnesota anyone planning to produce feeder cattle should plan to retain the calves at least to the yearling age. If a steer or heifer is to be marketed as a feeder from a Minnesota farm it will probably sell with largest profit in the fall of its second year when about a year and a half old. While the present abnormal wartime prices prevail, it is safe to say that the Minnesota feeder can be carried to the fall of its third year and sold to greatest

advantage when two and a half years old rather than at one and a half years.

In the production of feeder or grass-fat cattle it is just as important that good breeding stock of beef type be used as in the baby beef breeding herd. It is important that pastures provide a plentiful supply of grass throughout the grazing season or be supplemented during dry periods. It is important that cheap but comfortable winter housing be provided, and low cost but ample feed supplied during the winter period. Therefore, in normal times feeder cattle production must be limited to low-priced land. Because of the abnormally high prices prevailing for stocker, feeder, and grass-fat cattle during the war, some farmers who have been producing baby beef on high-priced land may find it to their advantage to grow the calves to older ages and then sell them as feeders or grass-fat cattle, or to fatten the older cattle through a shorter feeding period before marketing and with less corn or grain than they had used fattening baby calves.

FATTENING PURCHASED CATTLE

ONE of the first extensive uses of corn was in the fattening of beef cattle. This is still one of the principal means of marketing corn, and corn is still the principal grain feed for fattening cattle.

For many years about the only plan followed in fattening cattle in the United States was to feed them corn and prairie hay, or corn, corn fodder, and some timothy or clover hay. Now the variety of feeds has been extended to include other crops and by-products until we find every year thousands of cattle successfully and profitably fattened without corn.

Cattle are generally started on the fattening rations during the fall or early winter months. Among the reasons are:

1. *Cattle eat more and make larger gains for the feed consumed during cool or cold weather when there are no flies or mosquitoes.*

2. *Thin cattle suitable for fattening are offered for sale in largest numbers toward the close of the pasture season. Generally, such cattle can be purchased at lower prices during this period than at any other time.*

3. *The farmer who fattens cattle usually prefers to devote his labor during the cropping season to the production of feeds and then utilize winter labor for the care of the fattening cattle.*

The general practice of fattening cattle through the winter sometimes leads to an oversupply of fat cattle on the markets during the late winter and spring months, and to a shortage dur-



FIG. 5. A good silo and a cheap but suitable shelter for fattening cattle if sufficient bedding is used in cold weather

ing the summer and fall. This leaves an opportunity for some to benefit by having their grain-fat cattle ready for market during the summer or fall. It is, however, sound advice to the beginner to get his first experience during the fall, winter, and spring, as fattening during this season is less risky and requires less skill than in summer.

Purchasing the Feeders

Feeder cattle may be purchased in any one of several ways.

1. *The buyer may go to the ranch and purchase direct from the producer. The objection to this plan is the expense of travel and amount of time often required. It can be used to best advantage when the feeder wants a large number of cattle.*

2. *Throughout the range areas there*

are commission agencies who list cattle that are to be for sale by ranchers, and anyone wanting feeder cattle may order from them.

3. *In extensive cattle feeding areas there is often an agency that will arrange to bring feeder cattle into the area and sell them to fatteners. Under this plan the buyer has the advantage of seeing the cattle and learning the price before making the purchase.*

4. *Many producers of feeder cattle prefer to consign their cattle to a large central market to be sold. As a result the purchaser may place an order with a commission firm located on the central market, or visit the market himself and make the desired purchase.*

5. *In certain areas the fattener may often buy feeders in small lots direct from neighbors or nearby auction markets, in that way getting together the number he needs.*

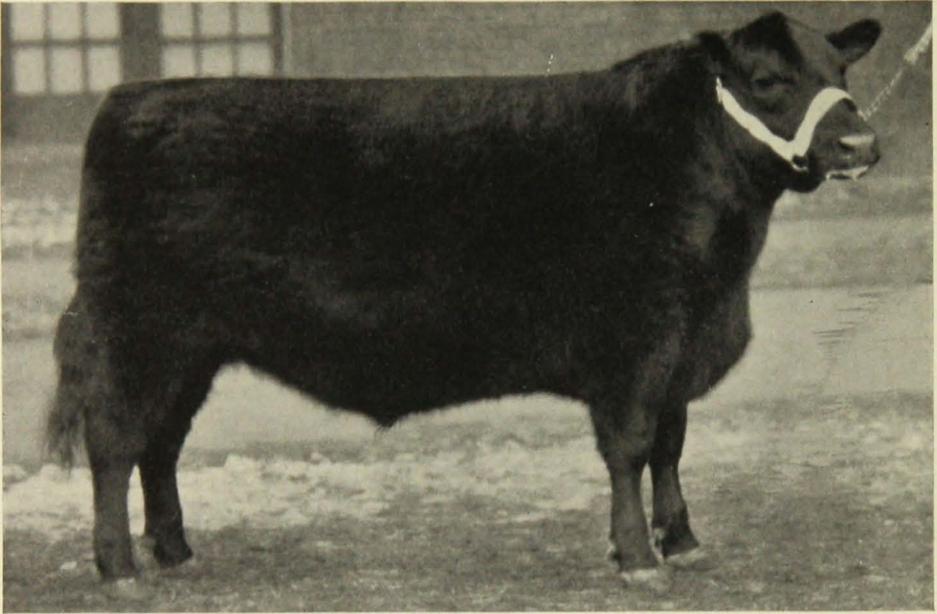


FIG. 6. Near perfection in baby beef form and finish

Kind of Feeders to Buy

Many classes and grades of feeder cattle are to be found throughout the country and on the large markets. 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 them if they are bought right. Getting good value 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 selected.

There are differences in the way cattle of the different kinds must be fed to get the largest profit from each. For instance, older cattle fatten quicker than younger ones and make a larger daily gain, but require more feed per 100 pounds of gain than young cattle. Heifers fatten more quickly than steers, but they show a slightly smaller daily gain.

Feeds for Fattening Cattle

The wide distribution 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. What feeds to use, how to prepare them, how to mix them, and what quantities to feed must be determined for each group of cattle. If home-grown feeds are to be fed, the farmer can simplify the problem by growing feed crops. Often, however, availability will determine what feeds should be fed. Sometimes, comparative cash values or costs of feeds must decide. The age, type, and grade of cattle may also affect the selection, preparation, and mixtures to be used.

Starting on Feed

If thin cattle or cattle just off 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 mixed 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 being 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 one-half pound per head every other day for calves, and daily for yearlings and two-year-olds for about the first 20 days. After that, increases should be made a little more slowly and the percentage of oats reduced gradually until in 15 days more the oats will be eliminated and the total amount of grain will be approaching a full feed. Oats is an excellent grain for starting cattle on feed but not for fattening. After the cattle are accustomed to grain, oats should be limited to 25 per cent of the ration or none at all. If alfalfa, sweet clover, or soybean hay is to be used, one feed per day 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 may be given, thus eliminating the nonlegume roughage. Many feeders believe that if good-quality green legume hay is fed, it is best to give only one feed per day of such high-quality roughage throughout the fattening period, and to continue some nonlegume roughage as about one half of the roughage allowance. This is to be recommended especially if a heavy grain ration is fed. If the grain ration is made rather light and bulky by keeping 20 to 25 per cent of oats in it or by feeding corn and cob meal, or if silage is fed, then the legume hay may be

used as the only dry roughage without risk of causing excessive scouring or bloating.

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.

Feeding a Protein Supplement

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 one-half pound per head per day of any of the standard protein supplement feeds, such as linseed meal, cottonseed meal, corn gluten meal, or soybean oil meal, and to increase gradually for a month or six weeks up to the amount it is deemed advisable to feed. How much protein supplement should be fed for most profitable results is a question frequently asked, even by experienced feeders. No simple rule can be applied. The amount of protein supplement that can be used to advantage may vary from none to as much as 2½ pounds per head per day, depending on the age of the cattle, the ration being given, and the cost of the protein supplements relative to other feeds. A protein supplement is more essential for calves than for older cattle. A protein supplement is more important with a bulky ration including silage than with a heavy ration and more important with a nonlegume roughage than with a legume roughage. The protein supplement will usually pay best when grain prices are high because it is usually then that the supplement feeds cost least in proportion to their nutritive value. At present, due to wartime ceiling prices, standard protein supplement feeds are moderate in cost compared to farm grains. If they were plentiful it would pay to feed them liberally to fattening cattle, but owing

to the great need for protein in the feeding of milk cows, hogs, and poultry, the supply at present is limited. Since the supplements contribute more to quantity production of human food when given to the above types of animals than when given to beef cattle, it is recommended as a wartime measure that they be fed sparingly to fattening cattle and not used when a fairly satisfactory ration can be compounded without them.

The Full-Feeding Period

The question is often asked, "How can one tell when fattening cattle have reached a full feed, or approximately a full feed, of grain?" An experienced feeder can readily tell by the behavior of the cattle, but it is not so easy for the beginner. When some animals begin to leave feed in the bunk, it may be concluded that all of the animals are getting all of the feed they need. Since a little less than a full feed of grain is usually more profitable than self-feeding or "full-feeding," it is good practice to feed no more grain than will be cleaned up by just about the time the first animals leave the feed bunk.

Another question frequently asked is, "How long must cattle remain on a full feed of grain before they will be ready for market, or how can the inexperienced feeder determine when they are ready for market?" The time required to reach ideal slaughter condition depends on many factors, such as age of cattle, sex, thrift, amount of fat carried at the beginning of the feeding period, ration used, and degree of fatness demanded on the market where the cattle are to be sold. In normal times the beginner commonly sends his cattle to market before they are sufficiently fat. The experienced feeder is inclined to keep them a little longer than necessary. There is a degree of finish that is ideal for the processor and retailer, but it is impossible to deter-

mine accurately just when the live animal reaches this ideal finish. Salesmen and buyers who handle large numbers do acquire considerable skill in judging ideal slaughter condition in the live animal. The feeder with a large number of cattle can well afford to have them inspected by a skilled buyer or salesman about the time he thinks they are nearly ready. By so doing he may avoid marketing too soon or holding too long.

On the average, calves put on feed at weaning time cannot be made ready for slaughter in less than 180 days for heifers and 200 days for steers. Yearlings put on feed off grass cannot be made fat in less than 140 days, or two-year-olds in less than 100 days. Usually the time required will be somewhat longer than the above minimums.

Sample Fattening Rations

The following rations and modifications of them are based on 20 years of experimental cattle fattening carried on by the Minnesota Agricultural Experiment Station, as well as on the experience of many feeders.

1. *Shelled corn, full-fed; protein supplement 1½ pounds per head daily; legume hay full-fed; and corn silage full-fed.*

2. *Shelled corn, full-fed; protein supplement 1½ pounds per head daily; and legume hay full-fed.*

3. *Shelled corn, full-fed, and legume hay, full-fed. Whole ear corn, coarsely ground, may replace shelled corn in any ration where shelled corn is listed.*

4. *Ground barley, 85 per cent, ground oats 15 per cent, full-fed; protein supplement 1½ pounds per head daily; and legume hay, full-fed.*

In the above rations full feeding means that cattle will be given all of the feed they will clean up at each feeding time. In small-grain-growing areas, barley or wheat, or a mixture of the two, might be used in place of corn.

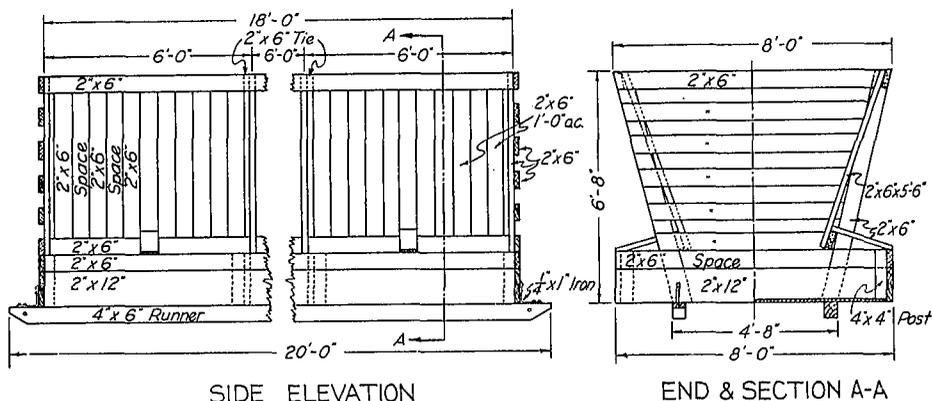


FIG. 7. A good type of portable rack for feeding hay to cattle

The legume hay might be limited to one feed per day and as much non-legume roughage fed as the cattle will consume. The following general statements are reliable guides in the selection and preparation of feeds.

If pigs can follow fattening cattle receiving corn, and hogs are selling at about the same price per pound as cattle, it matters little whether the corn is fed as chopped ear corn, shelled corn, ground ear corn, or ground shelled corn.

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

In normal times it is usually profitable to add a protein supplement to any ration composed entirely of farm-grown feeds.

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.

Normally the grinding of good-quality roughages is of doubtful value except as the ground or cut roughage may be used to add bulk to the grain ration for self-feeding. When roughages are scarce, and consequently high in price or low in quality, the saving made by grinding or cutting them may prove profitable.

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

When wheat is about equal in price, bushel for bushel, to good sound corn, it can be used for fattening with results about equal to those secured from corn. Wheat should not exceed one half of the grain ration.

Salt, either as block salt or flake salt, should be before fattening cattle at all times.

Most fattening rations contain enough mineral elements without the use of a mineral supplement. If rations do not contain a protein supplement, even though a legume hay is fed, or if the ration contains a nonlegume hay with a protein supplement, it is probably on the border line in calcium or phosphorus content or both. In this case, it is advisable that a high calcium mineral mixture, or preferably one containing a good source of both calcium and phosphorus, be fed. When needed, the mineral mixture can best be supplied by adding one pound of it to each 100 pounds of the grain ration.

Summer Fattening

Cattle may be fattened through the summer by keeping them in small lots and feeding grain and hay just as in

winter. Usually, however, slow gains must be expected, at least during the two hot months of July and August when flies and mosquitoes also worry the cattle.

Most men who fatten cattle during the summer prefer to allow them the run of a good pasture large enough to supply all of the grass the cattle care to eat. They are then given all they will eat of a grain ration similar to those recommended for winter fattening. If sweet clover, or a mixture of alfalfa and grass, or Sudan grass is

used as pasture it is advisable to keep some dry roughage in a rack available to the cattle.

It is doubtful that gains on fattening cattle can be made as rapidly or as cheaply in summer as in winter, but because grain-fat cattle are scarce through the fall months they usually sell at somewhat higher prices from September to December than at any other time, so that profits from summer fattening often equal or exceed those from cattle fattened through the winter.

HOUSING AND EQUIPMENT FOR BEEF CATTLE

IN the management of any beef cattle production enterprise, overhead expense must be kept low. The large items of investment must be in cattle and feeds, or in the land to produce the feed. This is because the profit on each animal is small at best, and any extravagance in overhead can easily

exceed the normal profit. Housing and equipment must be simple and inexpensive, yet well arranged for convenience and the least labor in the care and feeding of the cattle.

The breeding cows can be comfortably maintained throughout the winter in a cheaply constructed frame shed

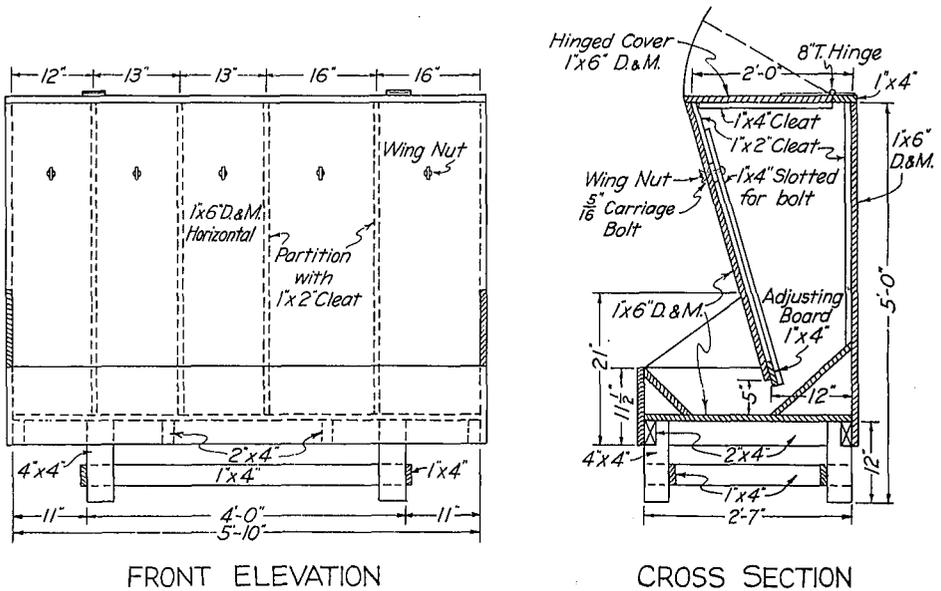


FIG. 8. A free-choice, five-compartment self-feeder for calves
 Inside partitions may be omitted and a single grain mixture fed

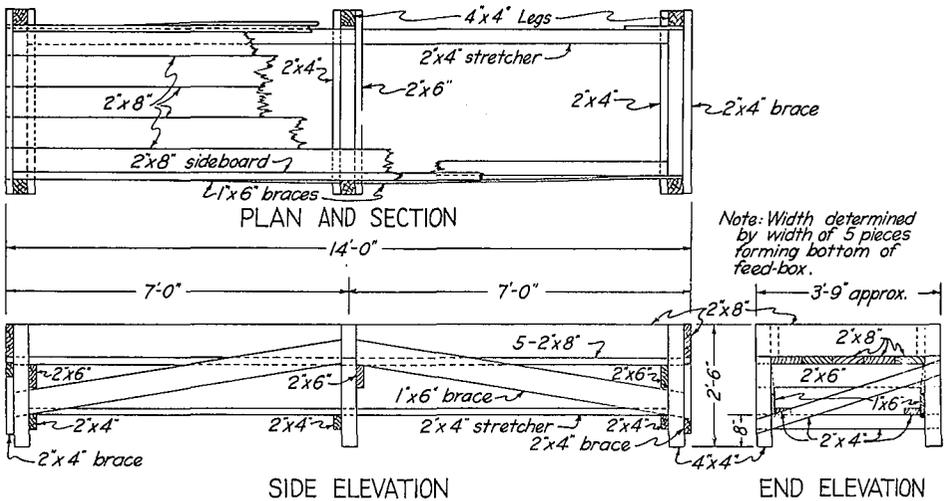


FIG. 9. A suitable feed bunk for feeding grain, silage, and cut hay to cattle

or in a straw shed if desired. Such a shed should have large doors opening to the south which should be left open except on cold stormy nights. The shed should have sidewalls at least nine feet high so that manure may be allowed to accumulate throughout the winter. It is kept dry and sanitary by adding straw as needed. The manure in a shed managed in this way will be two to three feet deep by spring, but that will do no harm. In late summer and early fall the manure may be hauled directly to the fields and spread before plowing.

Since there will usually be some calves nursing until late fall or early winter, one corner of the shed, or an entire end, should be partitioned off and made warmer by better construction. This should connect with the large shed by small doors or openings to let through a good-sized calf, but not the cows. This small room should contain a manger and feed trough or self-feeder from which the calves may be fed good-quality hay and grain. They will spend much of their time in this room and go out only to nurse or when the weather is comfortable.

The cows may be fed hay and silage

in racks and bunks out-of-doors or in mangers in the shed. Many beef cattle producers stack the hay along one side of the winter-exercising yard, and build a simple manger in place of the fence in front of the haystack, so that hay may be shoved directly from the stack into the manger. Many build a carrier track out over a line of feed bunks so that silage, or silage and grain both, can be conveyed right from the silo and grain storage room to the bunks and dumped.

Fattening cattle, stock calves, or yearlings may be wintered in a similar shed in a similar manner. Where the feeding is done out-of-doors it will pay well to construct a cement slab along both sides of the feed rack. Such a slab provides firm footing for the cattle and simplifies cleaning the yard.

Wherever a large group of beef cattle is to be handled, a cattle squeeze should be constructed to hold cattle securely for such purposes as dehorning, branding or marking for identification, injecting for the tuberculin test and reading the test, taking blood samples for the Bang's test, or vaccinating for blackleg prevention.

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 it now enjoys. Early improvement of cattle in the United States was accomplished largely by the crossing of bulls of the Short-horn, 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 much 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 produced in any foreign country.

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 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 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 for the type of work required in developing beef calves.*
2. *Sufficient ability in the type of work required to assure success in the raising and care of good cattle.*
3. *A thorough understanding and appreciation of the importance of taking the necessary precautions with the herd to maintain health, thrift, and freedom from contagious diseases.*
4. *A thorough appreciation and knowledge of the problems involved in selling purebred livestock, so that successful salesmanship may be developed along with the herd.*

The breeding of purebred beef cattle has been 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. As with many other commodities, the present tendency seems to be toward a better realization on the part of all concerned as to the true value of purebred beef cattle for breeding stock, and there is a tendency toward the establishment of 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 may produce them with confidence that the enterprise is fully as promising as many other production enterprises on Minnesota farms.

Purebred Beef Cattle Management

In the management of a purebred beef cattle breeding enterprise, three items must receive more painstaking

attention than is essential in market stock production. Greater care must be exercised in the selection of breeding stock; better feeding of young animals must be practiced to insure the fullest development of their inherent characteristics; and special attention must be given to selling surplus stock.

The objective in breeding purebred cattle is to produce animals that will have a high value for improving the common stock. To produce such animals, only good parentage must be used. The successful breeder of purebred beef cattle must first of all be a good judge of merit in the breed with which he is working. He must acquire a knowledge of blood lines within that breed and practice judicious selection of pedigrees as well as animals. Once the breeding herd is developed to the desired number of females, it is of advantage to keep heifers from the best-producing cows for replacements, rather than plan the continual purchase of new females. There is always a selling advantage when a bull or a heifer can be offered from a family of females that has been in a herd for several generations.

Beginners in the breeding of purebred cattle have often been told that "purebreds require no more feed than scrubs." It is true that purebred animals will survive on just as little feed as will scrubs. A scrub animal, however, is usually the result of both poor breeding and poor feeding. Poor feeding of purebreds will soon make them no better than scrubs. The advantage of the purebred over the scrub is not that he can get along on as little or less feed, but that he can use more feed to advantage and convert it into a product of greater usefulness and value than can the scrub. The advantage of purebred breeding can only be fully realized by good feeding, especially of the young animals, in order to develop them.

Correct feeding of beef cattle is simple enough so that anyone with

just a little experience and good common sense will have no difficulty feeding purebreds properly. Good grass pasture in summer and a legume hay plus some corn silage, corn fodder, or prairie hay in winter, supplies the need of the cow herd. His mother's milk until two months old, then along with the milk a liberal grain allowance plus what good hay or pasture he cares to eat until six to eight months old, will give the purebred calf the correct start. After that, a protein supplement added to a grain ration, fed according to the condition of the growing calf until 15 months old, will bring out the best inheritance there is in him. Later, feeding must be governed by the disposition to be made of the calf. If it is a heifer going into the breeding herd, grain feeding may be discontinued and the heifer carried along with the cow herd. Animals to be sold as breeding stock must be carried along on good feed until sold. Show animals must also have liberal feed allowances.

Selling the produce and surplus animals from the purebred beef herd to advantage is often the most perplexing problem confronting the breeder. There are no centralized selling agencies to which purebred beef cattle may be consigned for immediate sale as in the case of market cattle. The breeder of purebreds must find the buyer. It is therefore essential that the breeder advertise to let prospective purchasers know about animals he has for sale. Ever since improvement in our domesticated animals began, the show ring has been the best and cheapest available means of advertising. As soon as a breeder has good enough animals and enough of them to justify exhibiting representative animals from his herd at county fairs, he will find it profitable to begin exhibiting. As merit and numbers to be sold increase, he should reach out and take in state and national shows, at the same time beginning to advertise in farm papers and

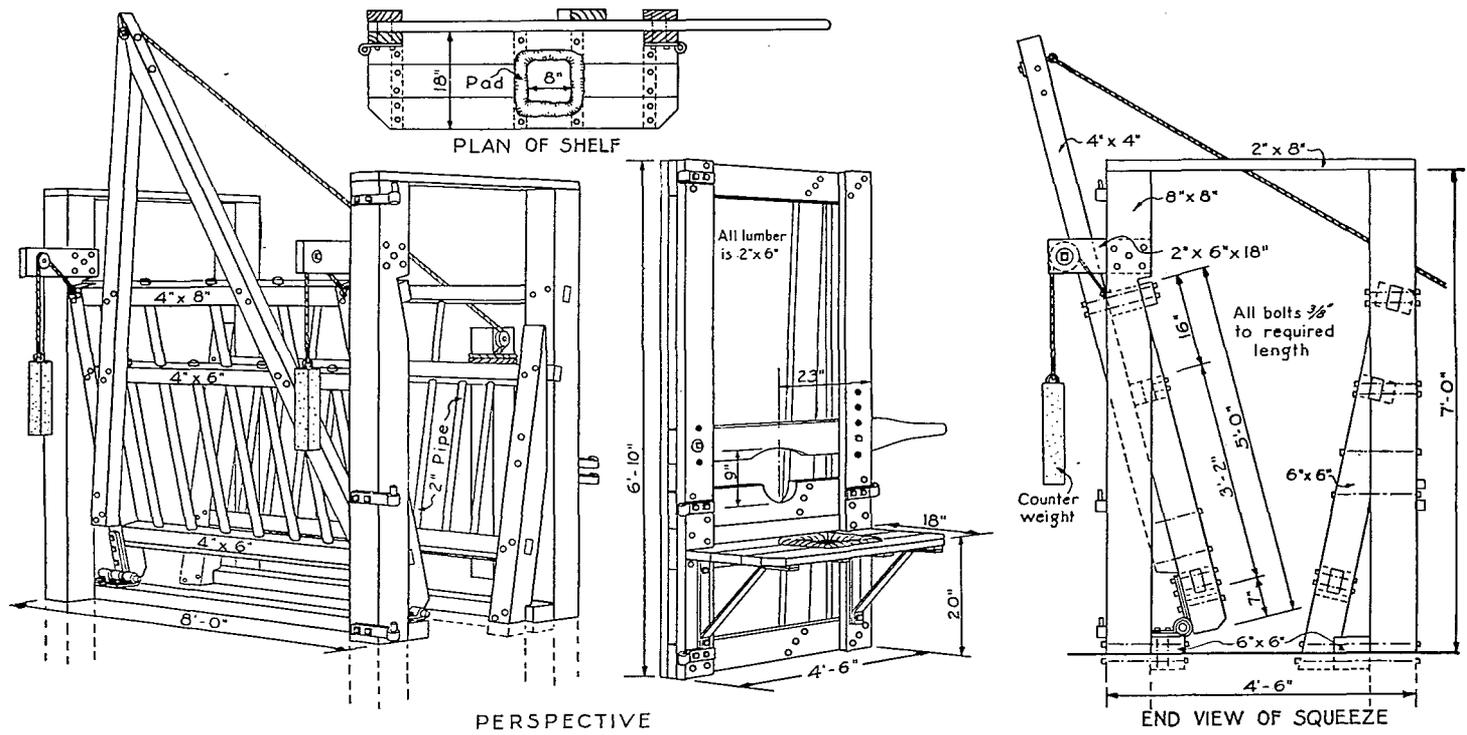


FIG. 11. A cattle squeeze rather than stocks is recommended wherever large numbers of cattle not accustomed to being handled must be caught and held securely for such operations as branding, dehorning, taking blood samples, or vaccinating

(From U.S.D.A. Farmers' Bulletin 1584.)

journals. The consignment of a few good animals to combination and breed association auction sales is an effective way of selling a few and has an advertising value. Finally, if a herd large enough to justify an annual auction on the home farm can be maintained, this will be found the most effective and satisfactory plan of selling purebred cattle.

A pleasing personality, a courteous manner, dignified, gentlemanly conduct, honesty, and fair dealing are attributes essential to the development of a successful purebred-livestock salesman. Good purebred beef cattle have a value

for improvement of the common stock of the country that is more often underrated than overrated by the general public. The breeder who has done a good job of producing good purebred animals is entitled to a financial reward for his service. The only way he can get it is by using aggressive, sound, legitimate selling methods, and it is his responsibility to himself to be a good salesman as well as a constructive breeder. More good purebred herds are needed to contribute further improvement to the great majority of herds of common cattle which produce the beef supply of the country.

IMPORTANT CATTLE DISEASES AND PARASITES

PROBABLY because beef cattle spend so much time out-of-doors they are comparatively free from diseases or parasites causing heavy losses. They are subject to such communicable diseases as tuberculosis, Bang's disease, foot-and-mouth disease, blackleg, anthrax, hemorrhagic septicemia, and others of lesser importance. Except for the cattle grub, beef cattle are seldom infested with internal parasites that cause any great amount of trouble. Some external parasites, such as lice and mange, often do cause considerable trouble. Space does not permit a complete discussion here of symptoms, causes, and treatment of all diseases and parasites of cattle. A brief statement concerning each of those commonly encountered in cattle in Minnesota is made in the expectation that cattle producers will make further study and take all possible precautions to prevent loss from diseases or parasites.

Tuberculosis—Every cattleman is familiar with the area test method by which tuberculosis in cattle has been practically eliminated from the United States. This dread disease is still a menace. Every cattle producer should practice faithfully the precaution of having his herd tested once a year so that

any reactors may be eliminated. All cattle purchased to be added to a breeding herd should come from a tuberculosis-free accredited herd or be tested before being purchased.

Bang's Disease—Bang's disease, or contagious abortion, is one of the most prevalent and damaging diseases of cattle. The cause of Bang's disease is known and a test to detect its presence is available. This makes possible the elimination of the disease from a herd by testing all animals and removing those that react.

If only a few reactors are found, the wise procedure is to send those to market and thus avoid a probability of their spreading the infection. If many reactors are found in a good herd it may be advisable to retain them, care for them in a separate group, and continue to raise calves from them. The calves should be tested one to three months after weaning and if free from the infection they may be placed with the noninfected group. Bang's disease has been eliminated from many herds of cattle in this way, and the herds kept free from infection successfully thereafter. Patience, perseverance, and the utmost care to avoid transfer of the disease from the infected to the noninfected group is essential to success if this method of procedure is followed.

A vaccine to prevent heifer calves from becoming infected has been developed and is being used in some badly infected herds as an aid in eliminating the disease. This vaccine should be used only when recommended and applied by the attendant veterinarian.

Foot-and-Mouth Disease—This disease has appeared on several occasions in the United States. It has always been eliminated by the destruction of infected animals.

Anthrax—Anthrax is prevalent in a few areas only and outbreaks have been kept under control by quarantine. It is successfully prevented by the use of a vaccine which produces immunity. Breeders located in an area where anthrax is known to exist should consult the veterinarian for the necessary precautionary measures.

Blackleg—Blackleg is similar to anthrax in many respects. Like anthrax, it is prevalent in certain areas and seldom found in others. It is usually fatal to infected animals. It is successfully prevented by the use of a vaccine. In an area where blackleg is known to exist the veterinarian should be consulted and should prescribe the necessary precautions.

Hemorrhagic Septicemia—Hemorrhagic septicemia is an infectious disease of cattle about which comparatively little is known. It is undoubtedly a bacterial disease and spreads from one animal to another. Animals affected seem to show different degrees of intensity of the disease. Mild cases recover without treatment while severe cases result fatally regardless of treatment. The principal symptoms are loss of appetite, scouring, a high temperature, dripping saliva from the mouth, and, in advanced stages, difficult breathing and discharge from the nostrils. Good care of affected animals is about all that can be recommended for treatment.

Actinomycosis—Actinomycosis or lumpy jaw is a noncontagious disease, symptoms of which are a swelling or large lump about the throat and lower jaw. It is caused by a fungus that attacks both the soft or fleshy tissues and the bones. While not readily transmitted from one animal to another there is often some transmission of the disease through feed contaminated with the discharge from infected animals. Animals of ordinary value that develop the disease should be sent to market and salvaged for what they will bring. Valuable animals may be treated during the early stages of the disease by having the entire growth or lump removed surgically by a veterinarian. In advanced stages surgery is not possible. Such cases are sometimes cured by dosing the animal internally with potassium iodide. The size of dose and length of time continued should be prescribed by a veterinarian.

Pink Eye—Pink eye is an infection of the eye causing watering and pus formation. In severe cases, a grayish ulcer forms on the eyeball blinding the animal temporarily.

The disease usually occurs in summer when cattle are on pasture. In herds of cattle running in large pastures or on ranches it is difficult and costly to treat each animal, so the disease is often allowed to run its course. It will do little permanent harm except that an occasional animal may become permanently blind in one or both eyes.

In smaller herds, affected animals should be placed in a darkened barn, their eyes washed twice each day with a boric acid solution and several drops of a 10 per cent argyrol solution dropped into each eye with an eye dropper. This treatment gives considerable success in arresting the spread of the infection and preventing any permanent blindness.

Bloat—Bloat is the formation of gases in the digestive tract more rapidly than they can be absorbed. It occurs when the digestive tract happens to contain a large number of bacteria and a large supply of material suitable for them to work on. This condition often prevails when cattle are receiving a heavy grain ration or when they are allowed a big fill of certain green feeds, particularly legumes. Many cases of bloat could be avoided by preventing the animal from getting an unusually large feed of grain or going onto a fresh pasture with its digestive system empty.

Mild cases of bloat usually need no treatment. More severe cases should be treated by giving the animal two ounces of turpentine by capsule with a veterinary capsule gun or by mixing the two ounces of turpentine in a pint of milk or cold water and giving as a drench. Extremely severe cases may require puncturing the abdomen at the point of greatest distention just beyond the outer edge of the left loin. This may best be done with a trocar and canula or in emergency cases it may be done with the blade of a pocket knife. This allows the gases to escape quickly and may be the only chance to save the life of the animal.

Ox Warbles or Grubs—The ox warble, or cattle grub, is one of the most serious of all cattle pests and one of the most difficult to control. The ox warble is the larva of a fly that deposits its eggs on the legs of cattle in early summer. The eggs hatch in a few days, the larvae burrow through the skin of the animal and travel through the tissues, finally locating beneath the skin along the back. The larvae grow slowly through the fall and winter months. Toward spring they eat a small opening through the skin. As the weather becomes warm they emerge through this opening as grubs about an inch long and as big around as a lead pencil. They then soon develop into

the adult fly which deposits eggs on the legs of the cattle to begin the life cycle all over again.

The cattle grub damages cattle by causing them discomfort, by damaging the hide, and by damaging the beef in the area of infestation.

The only known control measure is to try to eliminate the grubs by injecting a drug that will kill them in the openings they make through the skin. Ten to 15 drops of benzol, placed into the opening in the skin with an eye dropper or ordinary small oil can, is one of the most effective drugs. Another highly effective treatment is to dust along the back, over the swellings or lumps caused by the presence of the developing grubs beneath the skin, a mixture of one-half rotenone powder and one-half wettable sulfur powder. After being dusted along the back, the powder should be worked down to the skin by brushing lightly with a coarse brush. This treatment should be applied in the early spring about the time the openings appear in the grub swellings.

Mange—There are several types of mange mites that cause cattle great discomfort. Symptoms of infestation are uneasiness, rubbing against the manger or fences, and patches of scab on the skin. If mange is suspected, it is wise to have a veterinarian inspect the cattle and prescribe treatment according to the specific type of mange

present. A mild infestation in a small herd can be successfully eliminated by rubbing the affected parts with a thin paste made by mixing flowers of sulfur with a thin oil or melted lard. A heavy infestation in a large herd will likely require dipping the cattle in a lime-sulfur solution.

Warts—Seedlike warts often occur on the skin of cattle. They usually appear about the neck and are thought to be due to faulty nutrition of the skin. They can usually be removed in a few weeks by an application every two or three days of some soft oil, such as cottonseed oil or sweet oil.

Ringworm—Ringworm is eliminated by rubbing off the coarse cheeselike scabs that form in circular spots on the skin and then painting the spots with tincture of iodine. Ringworm should be treated promptly because if the infestation is allowed to spread throughout the herd it becomes very stubborn and difficult to eliminate.

Lice—Lice often infest cattle. They are easily eliminated in spring, summer, and fall by washing the infested animals with any one of a number of stock-dip solutions. During the winter months, lice 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 sulfur.

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