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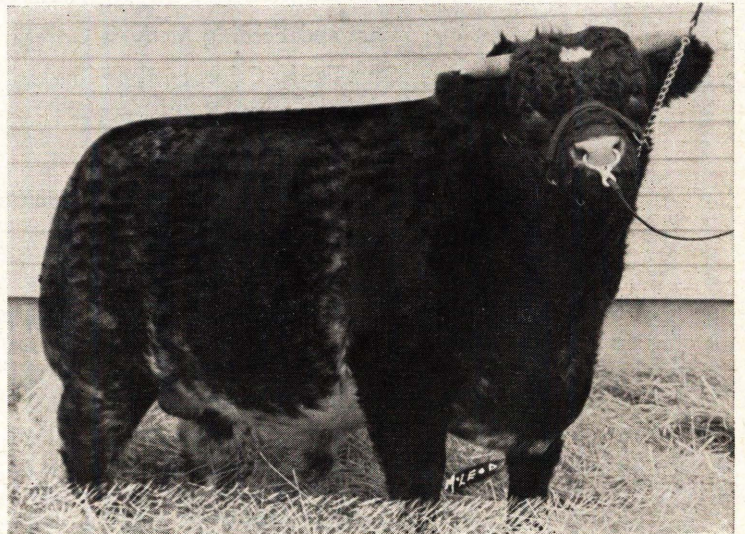
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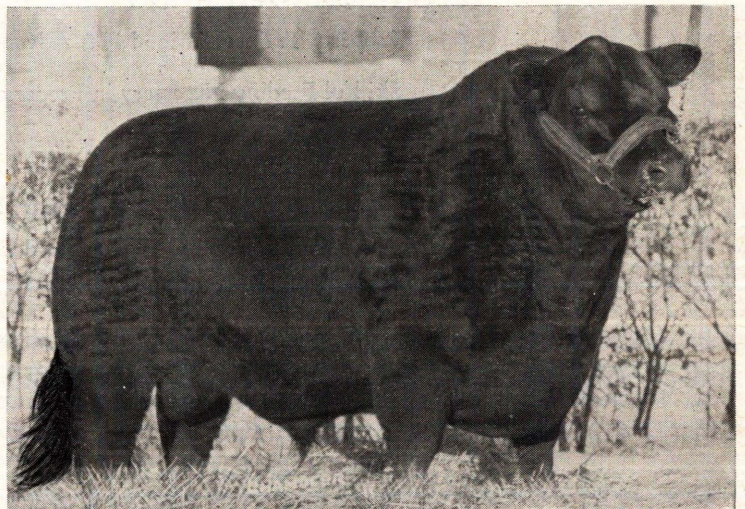
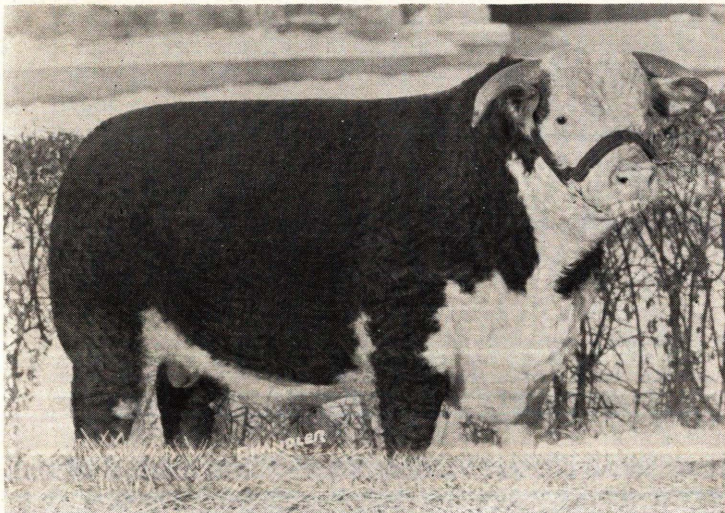
BEEF PRODUCTION GUIDE

EXTENSION CIRCULAR 553 JUNE 1958

SHORTHORN



HEREFORD



ANGUS

Agricultural Extension Service

SOUTH DAKOTA STATE COLLEGE
U. S. DEPARTMENT OF AGRICULTURE

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Beef Production Guide

By James O'Connell*
Extension Animal Husbandman

Selecting Beef Animals

The first and most important step in the baby beef phase is to select the type of calf that will make the most economical gains and dress out to a highly desirable carcass. The success and profit of the enterprise will depend on the conformation, feeding ability and quality of the calf selected.

Suitable feeder calves for profitable baby beef production are generally the offspring from sires and dams of good beef type and breeding. As a rule it does not pay the cattle feeder to feed out the calves of common or nondescript breeding for baby beef, as the fattened animal does not have quality sufficient to compete with the better bred, better finished baby beef. This especially is true in 4-H baby beef Club work. Therefore, the stockman who desires to produce his own feeder calves should make careful selection of cows for his beef herd. They may or may not be purchased, but by all means use a good type purebred beef sire. If a good cow, bred to a good purebred bull, will produce a good calf, then a better cow bred to a better bull will produce a better calf.

In selecting a calf for 4-H baby beef club work, choose a good beef-type steer calf in good health weighing from 300 to 450 pounds. You can get an idea of its conformation from its appearance. Look at the calf from a distance of 10 or 15 feet. He should possess the blocky beef form with straight top and underline, carrying well down in both fore and rear flanks. He should be low set and not leggy. When viewed in front he should be wide between the eyes, have a short face and a large muzzle—characteristics of a good feeder. The neck should be short, the ribs well sprung and the chest should be deep and wide indicating a strong constitution. When viewed from the rear, he should have good uniform width over the back, loin and rump, carrying out quite level from the hips to the tail head. The rounds should be full and the twist deep. A calf with coarse shoulders, a flat forerib, rough hooks, a narrow rump, a low back or a poor underling will not develop into a tidy baby beef since these faults usually become more pronounced as the animal fattens. Select a calf of quiet disposition because the nervous calf runs off too much flesh.

In addition to purchasing good beef-type calves, quality calves should be secured as well. Quality refers to the character of bone, hide, hair and flesh. The most desirable calf from the standpoint of quality is one with soft, fine hair; a pliable, elastic hide of medium thickness; a clean dense bone; and flesh that will be smooth and firm when the animal is finished. An animal of good quality will not only present a trimmer, neater appearance when finished, but will generally make faster, more economical gains.

Club members should avoid getting a thin unthrifty calf. The calf should be in good condition, vigorous and preferably showing a little milk bloom.

Many a 4-H Club member can recall how well formed his calf was at the start but that somehow it did not develop and feed out as he expected. This traces directly to the breeding history of the calf and emphasizes all the more the need for getting well bred feeder calves of strictly beef breeding.

SELECTING FOUNDATION STOCK FOR THE BEEF HERD

The purebred beef phase and the range cow-calf phase both demand the selection of desirable foundation stock. Desirable type breeding stock is as essential in producing high quality feeder steers as in growing purebred beef heifers and bulls.

The cow-calf phase is especially well adapted to central and western South Dakota. The phase is started by either purchasing a bred cow or a high quality heifer. The heifer is grown out and bred and forms the foundation of a herd. Heifer calves are generally retained and steers are sold as feeders. The project is managed much as western cattlemen handle their commercial herds and is very well adapted to the range area of the state.

The 4-H purebred beef heifer phase offers the member a chance to get started in the cattle business with good beef foundation stock. Purebred livestock herds are needed in every community to at least furnish the good purebred sires required by farmers for grading up their herds. As a rule, purebred livestock matures earlier, fat-

*William C. McCone, associate professor of animal husbandry, assisted the author on this revision which was adapted from previous works of I.B. Johnson, C.A. McDonald and C.S. Weaver.

tens easier, gives more return for the feed fed, commands a better selling price, and creates a greater interest on the part of the owner in the production of better livestock. Raising good purebred beef cattle is a science that can be attained through work and study and the close application of the best principles of livestock breeding.

IT PAYS TO START WITH GOOD COWS AND HEIFERS

It pays to start with as good foundation cows as possible. Choose the breed, then select cows and heifers that show the breed characteristics. In general, a good beef cow or heifer should have the beef form, being low set, of a rectangular compact form with good depth of body and straightness of top and underline. She should be feminine in appearance showing refinement about the head and breed quality throughout. In constitution, she should be rugged, carrying good depth of chest and good width on the floor of the chest.

The head should be short, slightly dished-in-face, good width between the eyes with broad muzzle and large open nostrils. The neck should be short and full, blending nicely into the head and shoulder and should not show a crest. The shoulders should be smooth and well covered. There should be fullness in the crop and a good spring of rib giving width to the back—and together with depth of body—giving capacity to the middle. The loin should be wide, deep and thickly-fleshed; the hips and rump should be level and well covered. There should be uniformity in width of top line over the back, loin and rump.

The quarters should be well fleshed, the twist deep and both fore and rear flanks should be low. The cow should show a sufficient udder development to indicate ability to nurse the calf for at least six months. The animal should have a quiet disposition, yet walk easily and actively and should have a good handling quality as indicated by uniform fleshing, a loose pliable skin and a glossy coat of hair.

A GOOD BULL PAYS FOR HIMSELF

Where comparisons have been made in using a scrub bull and a good purebred bull on an ordinary cow herd, it was found that the offspring sired by the purebred bull weighed 125 pounds more per head as yearlings and sold for a higher price per hundredweight on the market.

"One pays for a purebred bull whether one uses it or not" is a statement full of truth. Only good purebred beef bulls should be used on our beef cattle herds. In addition to showing the breed characteristics, the bull should show masculinity and ruggedness by his type and bearing. The head will be short, broad and burly in appearance, the neck will be powerful, strongly crested and blending smoothly into well developed shoulders. There should be a good deep, wide chest, an ample middle with fore and rear flanks strongly filled out. Strength and straightness of top line as well as uniformity in width of top line is

important. The hips should be smooth; the rump should be long, level and of good width. The quarters and twist should be well developed. The hind legs should not be bowed or sickle-hocked. The animal should have an easy carriage, good handling quality and be of a quiet temperament.

CONSIDER ANCESTRY OF FOUNDATION STOCK

Before finally selecting as foundation stock a purebred individual of outstanding merit, the stockman should be seriously concerned with the ancestry of those individuals. The pedigree is merely a record of the animal's ancestry. Such a record is kept on the books of the breed registry association. For every breed of livestock there is a breed record or registry association which is an organization of its breeders to cooperate in improving the breed, preserve its purity and protect and promote its interests.

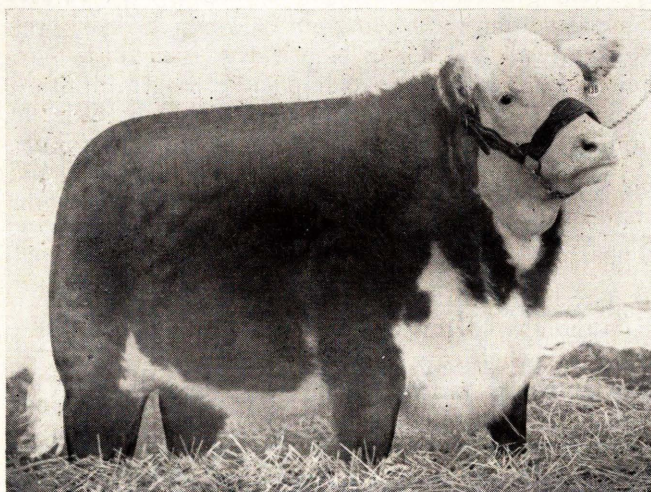
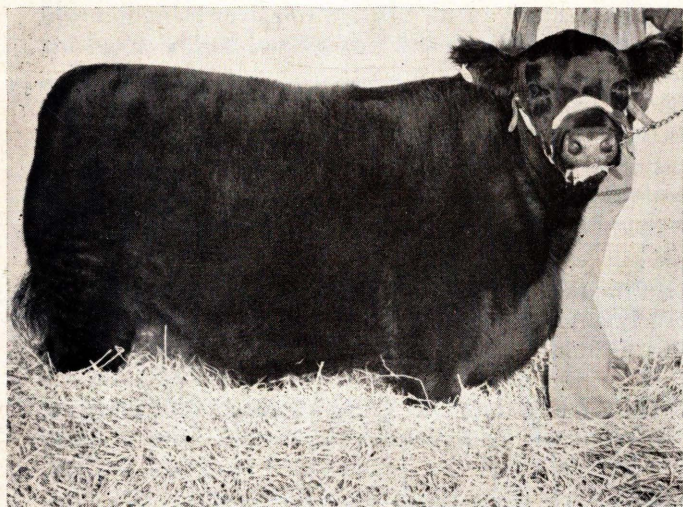
Feeding the Baby Beef

CARE AND FEEDING METHODS GOVERN YOUR SUCCESS

Four-H Club members should recognize from the time the calf is selected that the success of their project will be governed materially by their method of care and feeding. In the final analysis the calf must be fat and must carry a high percentage of the valuable meat cuts. The club member may have selected an excellent type feeder calf but if he is not properly fed, he will not make profitable gains and will not develop into a prime baby beef.

The feed and care which the baby beef calf gets during the fall and winter will have a lot to do with his final selling price, the profit made, and the place it will win in the show ring. All young animals grow as well as fatten. While the growth gains are the cheapest gains, one of the main factors in successful baby beef feeding is to get the calves to put on fat or finish along with growth. In other words, don't make the mistake of growing out the calf before starting to fatten it as calves have a tendency to grow too much even while being fed a fattening ration. Following are a few practical suggestions for economical feeding:

1. Have regular hours for feeding.
2. Feed the calf what it will clean up.
3. Keep the feed box and manger clean.
4. Allow a variety of feeds; feed the calf so it will fatten.
5. Make any changes in feeding gradually; sudden changes are objectionable.
6. Reduce the amount of grain fed immediately if the calf goes "off feed."
7. Let the calf get plenty of clean water.
8. Keep salt where the calf can get it at all times.
9. Keep the stall clean, dry, and well bedded.
10. The baby beef should not be permitted to run on pasture.



Above pictures show top examples of baby beef animals. TOP: A baby beef Angus in a 4-H project; MIDDLE: A champion Hereford steer; BOTTOM: An excellent example of a Shorthorn baby beef animal.

START FEEDER CALVES ON FEED GRADUALLY

If the calf has been raised on the farm, it may be fed grain before weaning and when the 4-H Club member finds it possible, the calf may be allowed to nurse until it is eight months of age. Feeder calves should be started on feed gradually. Changes in feed and the amount fed should be made slowly. Otherwise, the calf may scour and go "off feed."

Oats may constitute the major portion of the starting ration. Oats are bulky and readily eaten as the first concentrate. Two-thirds oats and one-third cracked shelled corn or barley make a good starting feed. After the first or second week, the ration might be gradually changed to 50-50 oats and corn and in three to four weeks changed to 20-25 per cent oats and the remainder shelled corn.

Oats can be gradually eliminated as the feeding period progresses. The amount of feed at the start will depend somewhat on the size of the calf. A good rule to follow would be to give the calf not more than one-half pound of the grain mixture a day for each 100 pounds it weighs for the first four or five days. This should be increased gradually until at the end of about the third week the amount fed will be about one and one-half pounds a day for each 100 pounds the calf weighs. For the remainder of the feeding period the grain should be gradually increased as the calf gains in weight. Calves on feed two months should be consuming about two pounds of grain per 100 pounds of live weight. If the calf has not been accustomed to eating alfalfa or clover hay, use very small amounts of these feeds at first.

AMOUNT AND PROPORTION TO FEED THE CALF

After two months of feeding the calf should be eating more pounds of grain than hay. As the feeding period advances, the grain should be increased and the hay decreased until at the end of three months the calf is eating at least one and one-half or two pounds of grain to one pound of hay. At the end of the fourth month the ratio of grain and hay should be about two and one-half to one. Near the end of the feeding period the calves should be consuming 12 to 14 pounds of grain and four to six pounds of hay.

Table 1. *Average Amounts of Feed Consumed by Full-Fed Cattle During Different Parts of the Feeding Period

Quarter of Feeding Period	Feed per 100 lbs. Live Weight		
	Total Air-Dry Feeds (pounds)	Grain (pounds)	Air-Dry Roughage (pounds)
1. First	2.7	1.5	1.2
2. Second	2.5	1.7	0.8
3. Third	2.3	1.6	0.7
4. Last	2.1	1.5	0.6
Average for entire period	2.4	1.6	0.8

*Average length of feeding period: 2-year old steers, 150 days; yearlings, 200 days; calves, 250 days.

SUGGESTED RATIONS

Rations for a calf might well consist of corn, oilmeal, silage and alfalfa hay. Barley or grain sorghum may be substituted for corn. Prairie hay may be used as the roughage providing such is adequately balanced with protein and minerals. Feeding trials have demonstrated that rations consisting of grain, oatmeal, a succulent feed and a legume hay generally produce best results. Here are some suggested daily rations for various weight baby beefs:

Feeds	Pounds to Feed per Day		
	500 Pound Beef	700 Pound Beef	900 Pound Beef
No. 1			
Corn	8	10	13
Linseed Oilmeal	1	1	1
Alfalfa Hay	3	4	4
Corn Silage	10	14	14
No. 2			
Corn	5	6	7
Barley	4	6	7
Cottonseed Meal5	.5	.7
Alfalfa Hay	4.0	5.0	5.0
No. 3			
Barley	4.0	5.0	7.0
Grain Sorghum	5.0	6.0	7.0
Prairie Hay	5.0	7.0	6.0
Soybean Oil	1.0	1.5	1.0
No. 4			
Corn and Cob Meal	8.0	10.0	12.0
Linseed Oilmeal	2.0	2.5	2.7
Cane Silage	8.0	10.0	8.0
Prairie Hay	3.0	4.0	4.0

FEED CALF TWICE A DAY FIRST HALF OF FEEDING PERIOD

The calf should be fed twice a day. A calf on full feed will be getting about all the grain that it will clean up at each feeding. A calf may occasionally go off feed. If it does, let it miss a feed or two and then begin again by allowing it one-fourth to one-half full feed. After regaining its appetite the calf can be brought back into full feed again in three or four days time.

Weights of Feeds

Feed	One Quart Weight
Corn (shelled)	1.7 lbs.
Corn (ground)	1.5 lbs.
Corn and cob meal	1.4 lbs.
Barley (ground)	1.1 lbs.
Emmer (ground)9 lbs.
Oats (whole)	1.0 lbs.
Oats (ground)7 lbs.
Rye (ground)	1.5 lbs.
Wheat (ground)	1.7 lbs.
Wheat Bran5 lbs.
Cottonseed meal	1.5 lbs.
Linseed meal	1.1 lbs.
Soybeans	1.8 lbs.
Molasses	3.0 lbs.

The majority of members enrolled in baby beef will only be feeding one or two calves and will be practicing hand feeding. However, for those club members feeding four or five calves or more, consideration should be given to the possibility of self-feeding. Experienced feeders find that the self-feeder saves considerable labor and there are quicker, more economical gains.

Most experienced feeders start the calves directly at the self-feeder, but with oats, crushed corn and cob meal or a mixture of similar bulky feeds. Shelled corn, barley or grain sorghum should be gradually increased in the mixture until the calves are on full-feed. Successful self-feeding requires a properly designed self-feeder, care in starting the cattle on feed, a good ration and the same care regularity that is required in hand feeding.

FEEDING HEIFER CALVES

Feeding heifer calves in the breeding project differs somewhat from the feeding out of calves for baby beef. More growth and not as high a degree of finish is required. Furthermore the feeding and management of the heifer entered in the club projects would be different from growing and developing her in a herd of beef cattle, as the animal must carry a higher degree of fleshing and as she is shown in community fairs and possibly the state fair, she must be fitted properly, much the same as is the baby beef that is to be shown.

The heifer calf ought not to be weaned until she is eight months old. It is well to start her eating grain before weaning (whole oats being very good for this purpose), permitting her to have about two pounds daily. If on pasture no other roughage is necessary, but if the pasture is short or none is available allow her to have what alfalfa hay she will eat. As winter approaches gradually change the grain ration from oats to one of the following or to a ration similar.

No. 1

Corn (cracked).....4 parts (by weight)
Oats (ground).....3 parts (by weight)
Linseed meal.....1 part (by weight)

No. 2

Corn (cracked).....3 parts (by weight)
Oats (ground).....2 parts (by weight)
Wheat bran.....1 part (by weight)

Start with three pounds of this mixture daily and increase the amount gradually until the heifer is getting one pound of the mixture daily for each 100 pounds of live weight. As spring approaches the feed may be increased until the heifer is getting from 1¼ to 1¾ pounds of grain mixture for every 100 pounds live weight. She should also have what alfalfa and silage she will clean up daily. The heifer should also have access to a good pasture during the summer but the feeding of the grain and alfalfa should be continued.

The heifer should be bred to a good purebred bull at 20 to 24 months of age.

KEEPING RECORDS IS IMPORTANT

Accurate feed and labor records should be maintained at all times. This is more systematically done where the club calf is fed by itself and where a batch of feed is weighed out for the calf. In making up the ration it is good business to use home grown feeds insofar as this is consistent with making rapid, cheap gains and putting finish on the calf. By feeding a ration composed of several feeds, larger consumption and greater gains will result. In all sections of the state it will not be possible to secure a variety of concentrates but in those sections which are well adapted to baby beef production such a variety is not only possible but usually economical as well.

The club member is urged to utilize as much home-grown feed as will effectively work into a balanced adequate ration. Feed combinations should be selected that will give good results at reasonable cost.

USE HOME-GROWN FEEDS WHEREVER POSSIBLE

Corn. The greatest fattening feed for cattle is corn. It is the most palatable and carries a high content of starch and oil. Corn forms the best concentrate for quickly filling the tissues of the steer's body with fat and thus rendering the lean meat tender and juicy. Since it is low in protein, it should be balanced in the ration with legume hay and a protein supplement. Generally the practice of getting the corn to the feeder cattle with the least amount of handling and preparation is the most profitable, where hogs follow the cattle. When fed to calves in the feed lot, shelled corn has produced more rapid gains than any other form in which the grain has been fed. When hogs do **not** follow the cattle in the feed lot, the coarse grinding of corn is preferable.

Grain Sorghum. Feeding trials conducted at the South Dakota State Agricultural Experiment Station indicate that grain sorghum makes an excellent feed for fattening steers. Two-year old steers made a gain of 2.7 pounds daily on ground sooner milo grain as compared to 3.0 pounds on shelled corn. Soybean oilmeal and alfalfa hay supplemented the concentrates in both lots. The milo fed steers required 65.2 pounds more feed per 100 pounds of gain than the shelled corn fed steers. Grain sorghum may be satisfactorily substituted for corn as a feed for baby beef in all sorghum-grain surplus producing areas of the state. Sorghum grain should be coarsely ground for best results.

Corn and Cob Meal. At the Minnesota Experiment Station, a baby beef feeding experiment was conducted over a period of years, using different feeds. Quoting from these results:

"Corn and cob meal did **not** surpass shelled corn in rate of gain when fed in combination with linseed meal, corn silage and alfalfa hay, but **did** excel shelled corn in economy of gain, degree of finish, selling price and profit per steer. The corn and cob meal ration proved excellent for starting the calves on feed and the calves did not at any time show indications of digestive trouble, such as bloating, scouring, or going 'off feed'."

After the calves are on full feed, it is advisable to make the feed more concentrated by adding a bushel of shelled corn to each four bushels of ear corn when it is being crushed and gradually increasing the amount of shelled corn in the mixture as the feeding period advances.

Barley. In some sections of the state it may be more advisable to feed barley rather than corn. In feeding tests conducted at the South Dakota Experiment Station, barley, coarsely ground, was very satisfactory but not equal to corn for fattening feeder calves; it required 12 per cent more barley than corn for the same amount of gain. Very good results are obtained where coarsely ground barley comprises half the grain fed and coarsely ground corn the other half in the calf's ration. Barley tends to give the cattle added bloom and mellowness of flesh with less patchiness.

Wheat. In feeding value wheat per pound is equivalent to corn and slightly higher when ground. It is less palatable than the other grains, and if a large amount is fed, some difficulty may be experienced in keeping the cattle on feed. It is an excellent feed when used with other grains. Wheat is generally not fed unless it is low in price as compared with corn.

Oats. Oats is considered more of a growing feed than a fattening feed; it is valued more as a feed for beef calves before weaning or for getting calves on feed. It is generally high in price compared to other grains and on account of its high protein and fiber content its value as a fattening feed is materially reduced. Oats is excellent for growing cattle, but as the only grain in a ration for beef cattle it is worth 20 per cent less than corn. On account of its bulkiness it should be used more heavily in the grain ration at the beginning of the feeding period and reduced as the feeding period advances. For best results it should be crushed or ground.

Emmer or Spelt. In an experiment carried on at the South Dakota Experiment Station, emmer was found to be a very good fattening feed providing linseed meal was added. It takes about 125 pounds of emmer to replace 100 pounds of corn. Emmer closely resembles oats in composition and, therefore should be especially useful in starting the calf on feed. It should be coarsely ground for feeder calves.

Rye. Cattle feeding trials conducted by the South Dakota Experiment Station indicate that rye as the only grain in a ration is a comparatively poor grain to fatten cattle. It is not palatable and its palatability was believed to be reduced by grinding. At the Nebraska Experiment Station it was shown that when ground rye formed half of the grain ration fed to calves, it was entirely satisfactory and economical gains were obtained.

ROUGHAGES

Corn Silage. Silage is a succulent feed. It has great value in cheapening the cost of beef production. Silage from well-matured corn is the best silage for beef cattle. Such silage carries a high proportion of grain and helps to reduce the amount of concentrates needed. On a well balanced ration in which silage is the chief roughage, a steer

will fatten rapidly and economically. It is not as a rule fed as the sole roughage but is fed in connection with some legume hay such as alfalfa.

Alfalfa Hay. This is a legume hay and is of great importance in balancing such grains as corn, barley and oats. It is rich in protein and ash, bone and muscle building elements, and it is very palatable. When fed with silage it makes an excellent roughage. However, if corn is being fed in the form of concentrates, corn silage may not be necessary when alfalfa hay is fed. Shelled corn and alfalfa hay make a satisfactory ration for cattle of all ages. If alfalfa is available it should by all means be included in the ration. Calves should be started gradually on alfalfa hay otherwise they may scour or bloat.

Sweet Clover Hay. Sweet clover hay is not as palatable as alfalfa hay but being a legume is relatively high in protein mineral and vitamins. Fine-stemmed, leafy sweet clover hay is preferred; coarse, woody hay is unpalatable and not as readily consumed. Avoid feeding moldy hay as it may result in the "Sweet Clover Disease."

Prairie Hay. This hay, common in South Dakota, may have a place in the fattening of steers. The feeding value is much higher than timothy hay. Prairie hay is deficient in protein and should be supplemented with a high protein concentrate. Feeding prairie hay with alfalfa is often practiced as a means of preventing scours.

Corn Fodder. This feed does not have a great deal of value as a fattening feed for feeder calves, but is more desirable in the wintering rations for breeding stock. If corn fodder is fed with legume hay, it may help to take the place of silage to a limited extent. In case of a feed shortage, corn fodder may be used in equal amounts to alfalfa—thus cheapening the ration.

Sorghum Fodder. Fodder cured from either the grain sorghums or the sorgos is valuable as a roughage for beef cattle where a legume hay of protein supplements are also fed. In some sections of the state where sorghum is grown it may be cured for fodder and used as a part of the roughage in the fattening ration.

Sorghum Silage. Although sorghum fodder is a satisfactory feed for baby beef, more economical results are possible when it is used as silage. Various experiments show that in wintering mature cattle, silage from grain sorghum produces nearly twice the gain per acre as does sorghum fodder. In feeding calves, 100 pounds of sweet sorghum silage (cane silage) was found to be equal to 87 pounds of corn silage. Sweet sorghum silage is generally worth less per ton for beef cattle than silage from grain sorghums, because it contains much less grain. However, in some parts of the state the greater yield of sweet sorghum or "cane," will more than make up this difference.

Sudan Grass Hay. Feeding value of sudan grass hay is about equal to prairie hay. It should not be used as the only roughage in a fattening ration for cattle but is best when fed in with a legume roughage.

PROTEIN SUPPLEMENTS

Usually 100 pounds of protein supplement in a fattening ration for beef cattle will save 250-300 pounds of corn. If 100 pounds of supplement costs more than the grain it replaces, its value in the ration may be questioned where a legume hay and corn silage are being fed. In baby beef club work, however, it is usually profitable to include a protein supplement in the ration because it brings faster gains and a higher selling price for the steers.

Linseed Meal. Most experienced cattle feeders prefer linseed meal to cottonseed meal as a protein supplement, especially in a non-silage ration. It has a beneficial effect upon the digestive system of cattle and gives them a sleeker appearance which usually means a higher selling price. As a general practice it is not profitable to feed more than two pounds per animal daily at any time during the fattening period.

Cottonseed Meal. This is a rich concentrate widely used as a supplement to fattening rations deficient in protein. In feeding cottonseed meal take care to include a green feed and an ample supply of calcium in the ration. Further, it should not be fed to calves under three or four months of age since it may produce some toxic effect in such young animals. Cottonseed meal is usually cheaper than linseed meal but is not as effective. A calf on full feed should not receive over two pounds of cottonseed meal daily since this should be sufficient to balance the ration. There is probably some advantage in feeding cottonseed cake as compared with cottonseed meal, especially when calves refuse meal at the start of the feeding period.

Soybean Oil Meal. During the past few years cattle feeders have shown increased interest in feeding soybean oil meal to cattle. In feeding trials in Illinois and Indiana, soybean oil meal was about equal to cottonseed meal in value per ton. At the Iowa Station, soybean oil meal did not produce quite as good a finish on fattening cattle as linseed oil meal, although slightly less feed was required per 100 pounds of gain. If the cost is right, soybean oil meal may replace other more common protein-rich concentrates.

Wheat Bran. Since wheat bran is lower in protein than cottonseed or linseed meal, a larger amount is needed to balance a ration deficient in this nutrient. It is widely used by showmen.

Flaxseed. In certain sections of the state flaxseed is available as a protein supplement. When used, it should by all means be ground. It is more difficult to feed than other supplements so exercise care in feeding or calves will go off feed. At feeding trials at the South Dakota Experiment Station, ground flaxseed proved an effective supplement in feeding baby beefs. Calves must be started on it gradually and when on full feed will consume approximately a half pound of ground flaxseed daily.

Soybeans. Where soybeans may be used as a protein supplement for fattening cattle, feeding them whole is

better than feeding them coarsely-ground or as a meal. No more than two pounds per head daily should be fed. Cattle may tire of the beans after 60 or 90 days so some other protein supplement should then be substituted for them.

MISCELLANEOUS FEEDS

Milk. If the feeder calf has been weaned before being started on feed it loses its milk fat and, with it, some of its "bloom." This milk fat is never regained. You can get more economical and rapid gains if the feeder calf is allowed to suck a cow at least until it has learned to eat grain. Under practical commercial feeding conditions it is not economical to permit the baby beef to suck after about eight months of age.

Molasses. Molasses has the same feeding value as corn. It is not a protein supplement. Usually it costs too much to be fed economically under South Dakota conditions, but its price in comparison with corn or other grain should not be the deciding factor in its use. It stimulates the appetite, causing calves to eat more feed, and showmen therefore consider it valuable. When used for this purpose it should not be fed in amounts over two pounds per head daily.

Minerals. In most sections of the state baby-beef, heifers or breeding animals should have access to this mineral mixture:

- 2 parts trace mineralized salt
- 4 parts ground limestone
- 4 parts steamed bone meal

This mixture should be placed in a feed-box in the lot, barn or pasture. It can be offered separately free-choice.

Where fattening calves are getting a ration of corn, a protein supplement, prairie hay and silage, you can fatten them without a legume hay by using finely ground limestone with a high calcium carbonate content to replace the hay. A three-year feeding trial at the Kansas Experiment Station bears this out. Calves getting one-tenth of a pound of ground limestone per head daily in addition to the above feeds gained faster, cheaper, sold for slightly more money and returned a greater profit than those getting alfalfa hay.

Salt. Trace-mineralized salt is the best kind of salt for a calf. This should not be mixed with the feed but should be kept in a separate box where the calf can get to it any time. Common block salt is not as good as loose salt because it is harder for the calf to get the proper amount. A calf should not have to spend this extra time licking a solid block. Also, block salt is more expensive than ordinary barrel salt. Too often block salt is sold on the theory that it contains tonics and medicines valuable to animals.

Water. Cattle should have water at all times. A large part of the body is made up of water and cattle cannot take on flesh unless enough water is available. It should be clean and fresh. In the winter time it should be warmed. Do not expect a calf to drink water out of a tank filled with ice.

Care and Management

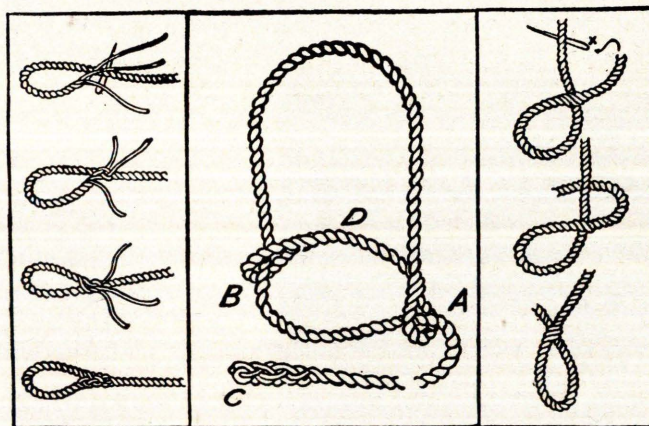
KEEP FEEDING CALF IN BOX STALL

Keep the calf in a box stall. A calf being fattened should not be tied; he will do much better if he has the run of the stall. It need not be especially warm but should be dry and protected from rain, wind and snow. The stall should be clean and well-bedded. The feed box should be low enough so that the calf can get at it easily.

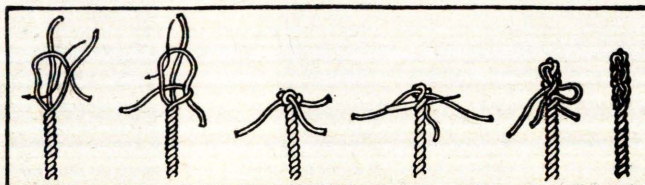
During the winter months allow the calf a small lot for exercising during the day. When warmer weather approaches permit him the use of the dry lot at night, keeping him in the stall during the day.

When the flies make their appearance, darken the stall by tacking old sacks over the windows and doors. Another good approach is to tack narrow strips of burlap to the ceiling of the stall (some, however, use full size sacks) and let them hang down far enough so that the calf can brush flies off by walking under them. Blanketing also helps to keep flies from bothering the calf.

Castrating the Calf. It is best to tie a calf that has been castrated but this may not always be possible. Calves used for baby beef are usually castrated when they are three to five months of age. This gives them a better chance to develop than if castrated too young. Castration is an operation that should be done by an experienced person. If a knife is used, treat wounds with an antiseptic solution. Too many calves have died from blood poison castration. Keep the calf in a cleanly bedded stall and examine the scrotum daily during the first week to see that wounds are draining properly.



ABOVE: (left) Steps in making eye splice B; (center) Completed halter. A, loop splice—B, eye splice—C, crown knot—D, nose piece; (right) Steps in making loop splice A. BELOW: Steps in making crown knot C.



Training the Calf to Lead. A calf should be broken to lead at a very early age. It's a mistake to let it go too long. He should first be taught to wear a halter and then be tied up for a while. After he is halter broke, you may start to lead him a little at a time. If he will not go forward when you try to lead him, turn him to one side. With a little practice and patience most calves will soon learn to be led. Some calves are wild but they are exceptions. Do not let the calf break away from you when leading him since he will try it later. After once broken to lead, he should be led often—every day if possible. A calf that leads well is a lot of satisfaction when taken into the show ring.

Making a Rope Halter. Each club member should make a simple rope halter to use in handling the calf. The calf will handle better with a rope halter than with an ordinary strap halter similar to a horse halter. Twelve feet of half-inch rope is enough for one halter. First make the loop splice and then the eye loop. The distance between the two should be 12 or 18 inches or long enough to serve as the nose piece; be careful not to allow too much rope for this purpose.

In making the loop splice, raise two strands and pass the long end or lead rope through the opening under these strands, then raise two strands in the long part of the rope, and pass the short end of the rope through this opening. Then draw the ropes closely together. A marlin spike is merely a sharpened pin made out of a small piece of wood about six inches long and one-half inch in diameter. It makes a hole between strands through which to insert the ends of the strands.

In making the eye splice untwist a little of the short end of the rope, make a loop and place the strands in

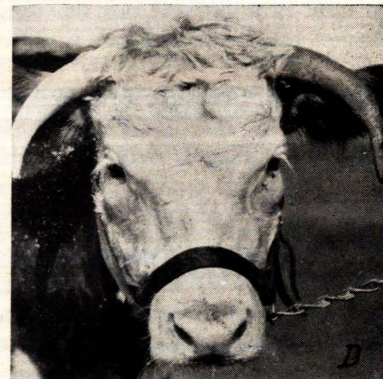
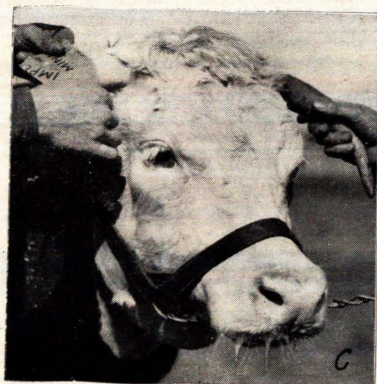
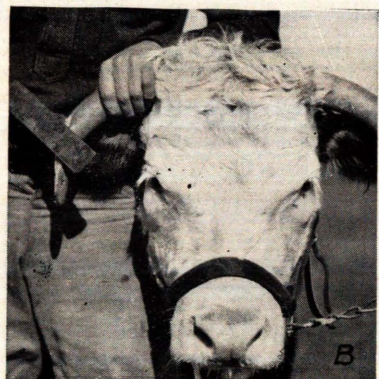
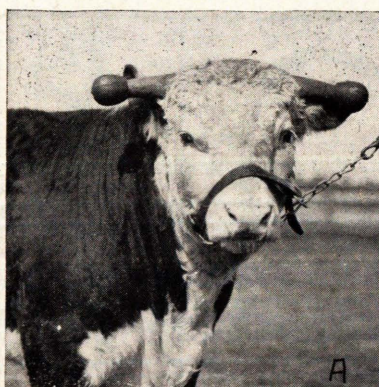
position with the two outside strands straddling the main rope and the middle strand running along the top of the rope. With the marlin spike raise any one of the strands as illustrated and pass the middle strand under it, diagonally to the right. Turn the main rope to the left and pass the left strand under the next strand of the main part of rope and pass the right hand strand under it from the lower side so that the end comes out where the middle strand entered. Now pass each loose strand under but one strand of the main rope, completing the splice as shown. When the loop splices and eye loop are made insert the lead end of the rope through the eye loop first; that part goes over the neck back of the ears. Now insert the end of the rope through the loop splice and this part of the rope serves as the piece below the jaw. The eye loop and lead rope should be on the left side of the halter. An ordinary knot should be put in this end of the rope to prevent it from raveling.

Fitting and Showing

PROPERLY TRAINED ANIMAL HAS ADVANTAGE IN SHOWING

The appearance, condition and behavior of a baby beef being shown at the fair or stock show effectively illustrates the club member's ability as a herdsman. The animal should present an attractive appearance because of its good conformation, its finished condition, its grooming and its training. It should become accustomed to being handled by strangers and should not become unduly nervous from strange surroundings and noises. A properly-trained animal that behaves well and stands correctly or poses has an advantage in the ring over one that is nervous, kicks or stands poorly.

In preparing baby beeves for the show ring many different things may be done to improve their general ap-



A: Horn weights are used to improve symmetry and curvature; **B:** Use rasp for greater part of trimming after scaly portions have been removed; **C:** Sandpaper horn to get greater smoothness; **D:** The right horn (on left, in picture) is properly trimmed and polished. The left horn is still in the rough. After following these steps, polish horns with woolen cloth moistened with linseed oil or sweet oil.

pearance. However, such things should be within the permissible practices and one should not resort to such a thing as "plugging" an animal. The animal should be frequently groomed; it isn't necessary to use a curry-comb but rather a brush. The idea is to clean the animal and soften his hide. If a curry-comb is used it may cut the hair and pull some out. A good bath once every two weeks is helpful. Use plenty of water with tar soap. Rub the hair with the hand or brush to loosen all the dirt particles. After the water and soap are removed a solution of dip may be applied. Some animals should be shown with hair curled while others will appear best if shown smooth.

SKILLFUL FEEDING NECESSARY IN PREPARING FOR SHOW

Cattle being prepared for show must be handled and fed somewhat differently from those fed for market. Cost of feed is not considered as much for show cattle as for market animals. Skillful feeding is necessary in preparing an animal for show. It is usually necessary to feed an animal longer to put him in show condition, than if he were going directly to the market.

While corn is one of the best of fattening feeds it probably should not be used quite as heavily for a show animal as for a market animal. Linseed oil meal produces a much better finish than cottonseed meal and should be used in place of it in the show animal's ration. Milk is the greatest of all feeds for putting a bloom and finish on animals. However, some states have ruled against feeding milk to 4-H calves after they have become 10 months of age. Roughages such as silage and hay can be used in large amounts for market cattle but for show cattle they do not contain enough nutrients to make the high finish desired. Therefore, the animal should not be fed too heavily on these two roughages. Grain rations for show animals will have to be increased and roughages cut down. In some cases it is necessary to add an appetizer

like molasses to the feed of show animals. The rations previously suggested may be used except larger amounts of grain or concentrates could be used and the animal should be fed three times daily.

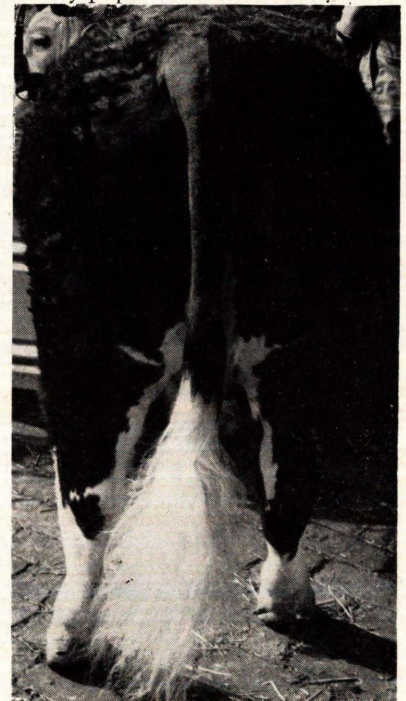
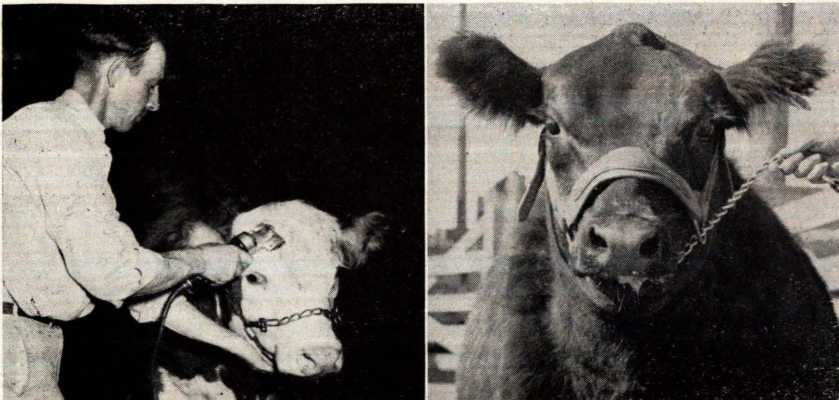
Care of Horns. The Shorthorn or Hereford beeves are more attractive if their horns are properly grown out, that is, symmetrical and nicely curved.

A plain-headed individual or one with rough, poorly-shaped horns does not attract the eye of either judge or buyer. On the Shorthorn, the horns are short and curve forward with the tips pointing slightly downward. The horns on the Hereford are of medium size, extend out at right angles from the head and curve downward and slightly forward. On some individuals it may be necessary to use horn weights or a horn trainer to get symmetry and proper curvature to the horns. Do not use the weights while the horns are young and soft. Start with a light weight—a half pound—and if the horns yield too rapidly remove them for two or three weeks, then apply again until the desired effect is obtained. Some stockmen use one-half or three-fourths pound weights keeping them on the horns for a week, removing them for four days and then repeating the process. When the horn gets below the level of the top of the head the ultimate direction of its growth is usually established. Where necessary to weight or train the horns, a club member should consult some stockman who has had experience in doing this, since study, experience and skill is required to secure the desired results.

Horns of medium size, properly shaped and neatly polished are attractive and an indication of quality in the animal. To polish the horns follow the practice outlined in the illustrations. Smooth off the rough surfaces with a sharp knife, then with a rasp or horn scraper, and rub smooth with a fine emery paper. The horns may then

BELOW: Allow calf to become familiar with the sensation before starting to clip. The polled and dehorned head on the right has been neatly clipped. Notice that the ears are not clipped. **RIGHT:** A clean, fluffy tail.

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be polished with a woolen cloth moistened with linseed oil or sweet oil, applying plenty of "elbow grease" in so doing. The horns will then present a clean waxy appearance.

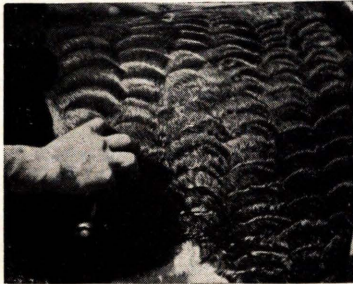
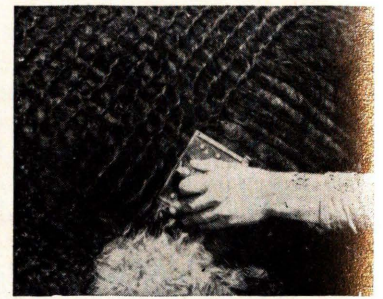
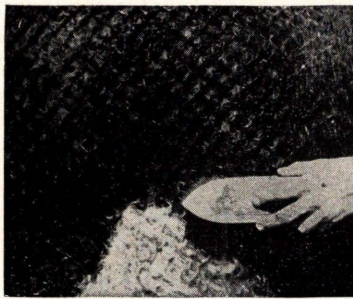
Clipping and Curling the Hair. What clipping is necessary should be done a week or 10 days before showing. The heads of the Aberdeen-Angus and Red Polled are clipped in front of a line around the neck about three inches back of the ears. Do not clip the hair on the inside of the ears, the eyelashes or the hair about the muzzle. The polled Hereford head is also sometimes clipped but the heads of the horned cattle are not. The tails of all beef breeds except Galloway are clipped. Care should be taken to leave a good switch. Starting a little about the switch of the lower end of the twist, clip the tail up to the head, being careful to have the clipping blend smoothly at the tail head.

For two weeks prior to showing be sure to brush the animal thoroughly each day. The final brush on short haired animals (Aberdeen-Angus and Red Polled) is made in the same direction as the hair following the brush with the bare hand each time as this draws the oil to the top of the hair. Short-haired animals are shown with the hair curled while Shorthorns may or may not be. It is well for the club member with a Hereford or Shorthorn animal to practice this curling beforehand so that by the time the animal is to be shown curling can be done quickly and properly. Angus are shown with the hair curled over the thigh and rough over the shoulder and neck with a smooth side and back.

An hour before the animal is to be shown moisten the hair with a weak solution of dip, being careful not to get the hair too wet. The hair over the back from in front of the shoulder to the tail should be parted along the backbone and, with a coarse comb, combed out to the edge of the flat part of the back on each side of and at right angles to the backbone. An ordinary straight-lined, eight-rowed curry comb with every other row of teeth flattened down makes a good marking comb for lining the hair. Line the hair from in front of the shoulders to the back of the round, starting the first line slightly below the outer edge of the flat portion of the back; when the hair is later brushed up, the end of the hair along this first line will curl up even with the level part of the back and thus give it a wider appearance. Make the lines parallel. After the hair has been lined, it may be brushed up with a stiff brush or a Scotch comb, leaving it in distinct wavy lines as desired.

Brush up the hair on the flanks or any defective places so as to make them appear fuller. Oftentimes the hair on the Hereford is curled or marcelled. A round spring curry comb is used, the outer two rows or spring being bent to a point. The wavy effect is made by a zig-zagging pull on the comb starting from the level of the top line and continuing downward to the level of the underline. The tips of the hair may or may not be brushed up following this procedure.

Care of the Feet. Do not neglect the feet of the animal to be shown; unless the feet are properly trimmed it may



Herdsman above is making a diamond curl. At right shows start of the marcel.

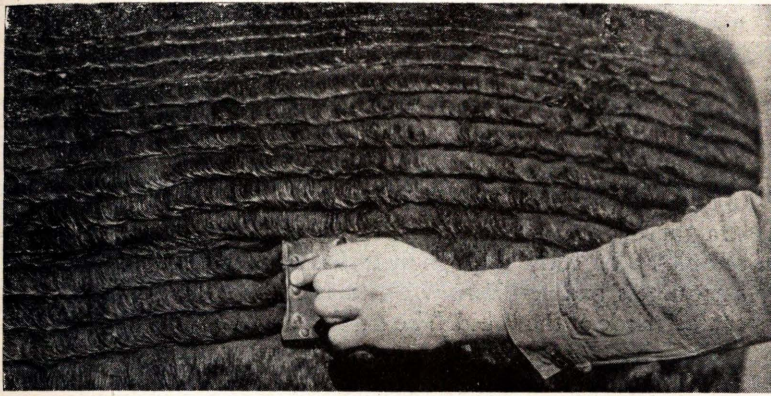
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ABOVE: (left) The curl with the round comb—(right) The tail is kept well clipped. BELOW: Wave made with a curry comb for short hair.

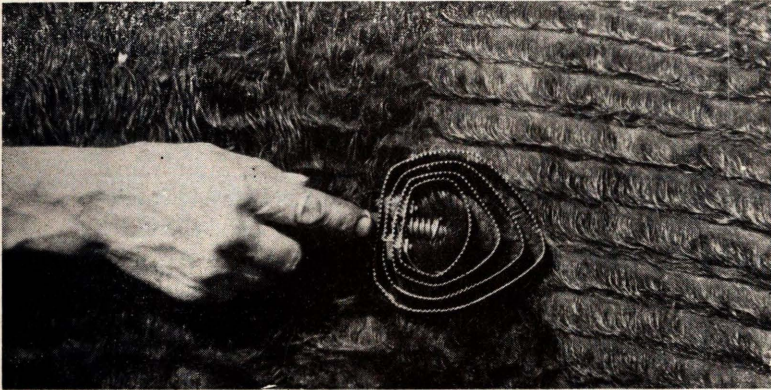
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Making the curl with parallel lines.

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These hooves need trimming.

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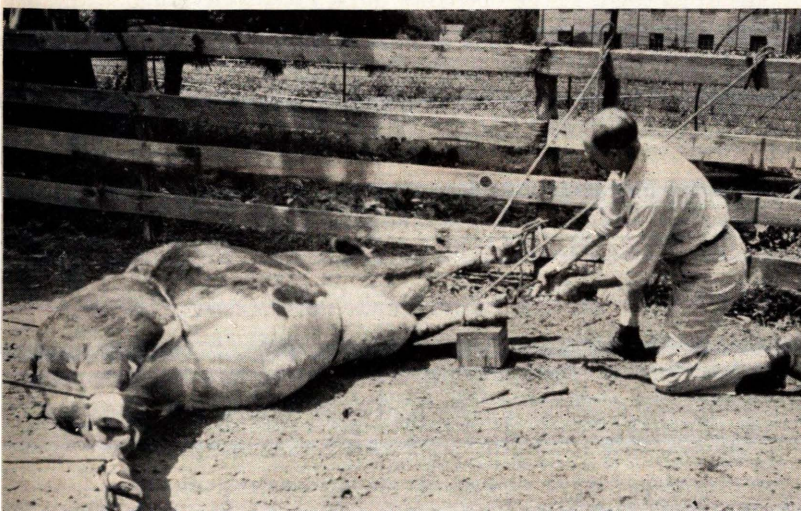
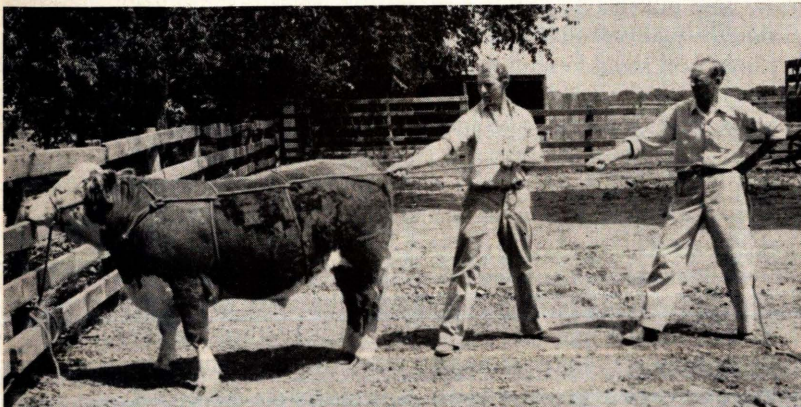
be difficult for it to stand squarely. When trimming the feet tie the animal in a stall or alongside a board fence. A heavy rope is passed horizontally along the animal's body, the ends tied securely to the fence or stall so as to hold the animal in place. If a dehorning chute is available for this work, all the better. If preferred, the animal may be thrown and tied in order to trim the feet.

In trimming the feet use a hoof knife or a heavy pocket knife and a rasp. In using the knife trim the lower edge of the outer wall of the hoof so it is about level with the sole—always cutting toward the toe. When the hoof has grown rather long it may be necessary to first use a hoof pinchers. In trimming down the toe with a pinchers place the dull or blunt side of the pinchers on the outside wall of the toe. Be careful not to cut the hoof too short so as to cause soreness and lameness, for an animal that walks lame is at a disadvantage. After trimming down the toe sufficiently, level the sole of the foot with the rasp. The hoofs may then be scraped or smoothed off with sandpaper and polished with oil such as linseed oil.

TRAIN TO LEAD AND STAND

Train the animal to lead and to stand; it should be properly fitted with a halter and led a little each day. Cattle are always led from the left side. Pose the animal frequently as if it were being shown and it will soon learn to stand in this pose. Teach the animal to stand squarely on all four feet; don't permit it to stand stretched out as this makes a sagging back. Its head should not be held higher than natural for the animal. If the animal is well trained beforehand to lead and stand, this will be made easier. A long, light stick is carried in showing beef cattle and by slightly pressing an end of this stick between the toes or on the top of the hoof of the animal its feet can usually be placed correctly. The club member should always be alert to have his animal present the best possible appearance to the judge.

At the Fair and in the Show Ring. If the animal is well finished, fitted and properly trained, there is not much more for the showman to do except keep a watchful eye on his animal. In moving the animal to the fair or show, be careful not to overheat it or unduly excite it. Cut down on the amount of feed at the last feeding and just prior to moving it. Upon arriving at the fair, do not feed it heavily but first of all give it plenty of water, if it is not too hot, and a little hay. After a rest of an hour or two it may be given a feed of grain. Then try to follow the same regular schedule of feeding as was practiced at home.



The rope is in place for throwing the calf (top photo). Below, the calf is cast. The halter and feet ropes are tied for quick release if necessary.

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While at the fair, give the animal plenty of exercise each day; this can best be done early each morning. If the animal refuses its feed, let it miss a feed or two; chances are its appetite will come back strong.

When your class is called for the show ring, have your animal ready to enter the ring when the last call is made. Regardless of how well an animal has been fitted it will seldom win in the show ring if carelessly shown. Often a good showman with a somewhat inferior individual will win over a better individual poorly shown. Stay on the left side of your animal when you lead it, hold it or show it. When in the show ring stand on the left side of the animal, face the inside of the ring, holding the animal with your left hand. Watch your animal and watch the judge.

After standing in the show ring for some time an animal will often become tired and restless. This may be overcome by leading the animal around and bringing it back into position when it is not being examined by the judge. However, when the judge is examining the animal or whenever there is a possibility that he may be about ready to do so, the animal should be in place and standing properly.

When in the show ring be a good sport. Remember you are a stockman and a gentleman. Don't criticize the judge's decision; he has had an opportunity to carefully pass on all the animals in the ring and his judgment is final. Thank the person who hands you a ribbon and demonstrate that it was the animal that won it and not you by putting the ribbon on the animal instead of on yourself.

The Range Management Project

The range management project is designed to fit live-stock production conditions and practices in the range area of South Dakota. The 4-H Club member, not favorably situated to feed out a baby-beef or to enroll in the purebred beef heifer project, may find the range management project to his liking. The project is practical in much of the central and western areas of the state and gives the club member an opportunity to build a herd of his own at a nominal cost.

The project begins with the purchase of a bred cow or a heifer. The purchase of the bred cow is preferred since you can get a return on the money invested at an early date. Whether to start with a bred cow or a heifer, however, may depend on the individual member, method of financing the purchase, the beef cattle cycle, feed and equipment.

SELECT ANIMALS FROM PUREBRED SIRES

Many of the factors previously discussed in selecting foundation stock for the purebred beef cattle project and in selecting a satisfactory feeder-calf for the baby-beef project are also applicable in selecting animals for the

management project. Although little emphasis can be placed on pedigree, select only those animals sired by a purebred quality sire. The animal should be high-grade in every respect, being true to breed type. In general the animal should be deep and wide of body, straight and strong of back, deep and wide of loin, smooth over the tail head with excellent depth and width of quarters, straight legs and ample bone. The animal should exhibit symmetry of body throughout with adequate quality, smoothness and femininity. Color markings should be characteristic of the breed. The head should be short and wide. The udder should be examined to be sure it is sound with four well formed teats.

Breeding Practices. In western South Dakota calves are dropped from April 1 to May 15 with the majority coming the latter part of April. The club member should plan to have his calves dropped as early as possible since they will grow out better by fall and will make a better showing in the show ring. If the member must range calves, April 15 is the earliest safe date; however, if adequate shelter is available, calves may be dropped the latter part of March. If calves are not desired before April 15 the bull would be turned in about July 7. The gestation period is 283 days.

Heifers should be bred so that they are at least 27 months of age before they drop their first calf. Earlier calving tends to retard the growth of the individual and it is unlikely that she may reach her maximum size.

The bull plays a most important part in the production of quality feeder steers or breeding heifers. The ideal range bull should exhibit masculinity throughout, should be deep and wide with a straight, strong, well-fleshed back, deep loin and well-developed hind quarters. He should have a wide spring of rib, smooth shoulders with ample width of forequarters since this indicates desirable constitution. Legs should be strong, straight and relatively short.

The number of cows per bull will be influenced by the age and condition of the bull and the class of range. Younger bulls may be placed in small pastures where there are no old bulls, with only 10-15 cows per bull. The average cattleman in western South Dakota allots one bull to 25 cows. Large operators often divide the range with 100 cows and four bulls per pasture. Under extensive range condition this tends to increase the calf crop. Maintaining a breeding cow in good natural flesh is also conducive to a high calf crop. The breeding herd should be pastured separate from the steers.

Range Management. Management methods will vary with the location, range, equipment, feed and water available and size of herd. In western South Dakota, however, it is the common practice to permit the beef herd to graze on range throughout the year, so far as weather conditions will permit. Good winter and summer grazing provides the cheapest gains on calves and maintenance of the breeding herd. Factors that may be considered in providing adequate pasture include:

1. Avoid over-grazing. Regulate the number of cattle so that about 20 per cent of the forage cover is left as a

safety factor for drought years and increased forage production every year.

2. Distribute the cattle uniformly over the range or pasture area. This can be accomplished by placing salt boxes in places least grazed by livestock, herding, draft fences and by proper distribution of water facilities.

3. Utilize the pasture or range area during the proper grazing season, keeping in mind times when forage is most nutritious and palatable and when reproduction will be least interfered with.

4. Do not practice continued year around grazing. Continued removal of forage weakens the plant root system and the plant may eventually die.

5. Practice deferred grazing on a portion of the ranch unit each year under a plan that covers the entire ranch unit. This allows the grass to seed and new plants to start.

6. Do not allow trails to become permanent.

7. Remember that any grazing system as deferred, rotational, etc., does not reduce the available forage for cattle but limits the season of the year it will be available.

8. Grasses are our most nutritious and palatable forage plants. With proper range and pasture management practices grasses will replace weeds and unpalatable range forage plants.

If sufficient range is available it is generally best to run the cows, heifers and steers in separate pastures. This is essential since heifers may "take up" and calve too young. Further, steers are often an annoyance to breeding cows during periods of heat.

Castration. Bull calves should be castrated when three months old or younger. If delayed until six months or more they will in many instances annoy other cattle in the herd. If delayed too long, a crest begins to develop, the horns become larger at the base and even after castration such individuals will be "staggy" in appearance, an objectional characteristic. The operation may be performed by an experienced person, if common sense rules of cleanliness are applied.

REGISTER BRANDS AT STATE OFFICE

On the range, branding with a hot iron is the most common method of ownership identification. The brand used should be recorded through the State Brand Office at Pierre, South Dakota. Liquid branding fluid is discouraged unless the individual is quite experienced. Acid is liable to run and result in a smeared brand, difficult to read. Calves are branded by either roping, throwing and tying or by running into a branding-chute.

Occasionally earmarks or dewlap marks are used for identification on the range. Earmarks are made by splitting the ear, by cutting off squarely a small portion of the ear called "cropping" or by removing a V-shaped portion from the upper or lower edge of the ear. Dewlap marks are made by cutting a strip of hide on the dewlap. Branding, however, with the registered hot iron is recommended to other methods of identification.

Dehorning. Calves should be dehorned when small. Calves in good condition that are to be well cared for during the winter may be dehorned late in the fall. Otherwise it may be well to wait until the following spring. In the absence of a dehorning chute the calf may be thrown and held firmly. Care should be taken in removing the horn to take a strip of skin at least one-quarter of an inch wide and extending around the horn; otherwise, an odd shaped horn may grow out. Apply pine tar to the wound. For young stock the dehorning clipper may be used, but for older stock a small hand saw is best.

In small herds under close supervision, the caustic soda or potash system may be used. This system is used only on very small calves where "buttons" are present. The hair is clipped around the button or small undeveloped horn and petrolatum or vaseline applied to prevent the caustic from coming in contact with the skin. The end of the caustic to be held in the hand should be wrapped with paper and the other end slightly moistened. The moistened end is then rubbed on the undeveloped horn. Two or three applications are necessary. Allow the caustic to dry after each application.

Many ranchers also use the "dehorning spoon" on small calves with undeveloped horns. The horn button is merely gouged out with this instrument and pine tar applied to the wound.

Weaning. Calves may be weaned between seven to nine months, by separating them from the cows and confining them in escape-proof pastures or corrals. It will generally be necessary to drive the cows and calves into a corral to sort out the calves and then drive the cows back to their range and continue them out of sight and hearing of their calves. Good tight pasture fences help materially at weaning.

Winter Feeding. Although the rancher is dependent on good winter grazing, some supplementary winter feeding is required in most areas. The extent of supplementary feeding will be governed by the severity of the winter and the amount of snow. The kind of feed will be determined by the types produced in the particular locality.

Breeding cows should be wintered as cheaply as possible without interfering with their breeding capacity. Grazing may be continued as long as the cows remain strong or until a large amount of snow makes grazing impossible. Supplementary roughage may well consist of prairie hay, cane fodder or straw. Ten to 12 pounds of roughage with one pound of a protein concentrate per day should carry the breeding cow through the winter in good condition. Many cattlemen find it desirable to supplement the grass with one to two pounds of a protein supplement, as cottonseed cake, during cold winters so that cows remain stronger and have less difficulty in calving.

Calves weaned in the fall should be fed liberally during the winter since they make better use of their feed than when older. Feed should be of the best quality. Calves may utilize range near the ranch buildings not grazed during the previous summer. In a severe winter

calves may be kept at the ranch buildings in a corral with a shed and fed good quality roughage supplemented with a half to a pound of protein concentrate, as cottonseed cake, or 6-10 pounds of oats.

Yearling steers and heifers are not generally fed as liberally as calves. Such stock must be wintered cheaply to insure profit in holding them. Most stock will be sold as yearlings or two year olds. Under present marketing conditions few steers on the range area will be kept and sold as three year olds. Grass supplemented by certain roughages will constitute the major ration.

Market Classes, Grades

A working knowledge of market classes and grades of cattle helps the livestock producer to interpret market demands and to sell his stock most advantageously. Knowing grades helps the producer to follow the market quotations which he receives by market letter, market papers or radio. If there is a change in market price, it does not mean that all grades of stock will fluctuate in the same manner or to the same extent. When the stockman knows cattle grades the market fluctuations can be interpreted in the light of his own stock.

Livestock grading has not been as fully developed as the grading of grain. Since livestock is an entirely different product than grain, it cannot be measured by mechanical methods as is grain. Then again, the wide range in kind, quality, and conditions of livestock makes it very difficult to grade by description.

The United States Department of Agriculture has worked out standard grades for cattle and calves. By such a system of grading it is possible to compare prices of like grades all over the country and to buy without seeing the animals. While in some instances feeder cattle are bought and sold on description, the great majority of cattle change hands only after inspection.

Grades of Feeder Calves: Feeder calves and cattle, as the name implies, are purchased to feed out or finish for the fat cattle market. At times, when market conditions warrant, cattle suited for slaughter may be taken out to the feed lot and fed out as more highly-finished beef. Feeder calves are graded as fancy, choice, good, medium, plain and inferior.

Fancy feeder calves are of strictly beef breeding, being superior in conformation, quality and covering. They are lowset, blocky, deep thick and compact with a straight top and underline; head is short and wide with a large muzzle. Neck is short, the crops full, the back and loin are wide and this width of topline is carried uniformly to the tailhead; the flank is low, the twist deep, and the rounds plump. The hide is soft and pliable, there is a firm, even covering of flesh or calf fat, and the individual shows quality and refinement throughout.

Choice feeder calves are of good beef breeding, possessing a high degree of conformation, quality and covering. As compared to the fancy grade the descriptive term "moderate" may be used in describing or referring to

the quality, the covering, and to the parts of the conformation.

Good feeder calves are of beef breeding, carrying fairly good conformation, quality and covering. They are of strictly beef type, but may be slightly too coarse or too refined, and the straightness and uniformity in width of topline may vary slightly. The hide is not as pliable as in the first two grades and they lack a little in uniformity in covering or fleshing.

Medium feeder calves have the color markings of the beef breeds but may possess a trace of dairy breeding. They are deficient in conformation, quality and covering, being more angular, having a slightly longer head and neck, do not have as full a spring rib and the rump may be narrow or peaked. They lack uniformity and what the feeder terms "balance." The hide is thicker and not as pliable.

Common grades of feeder and stocker steers are poor in conformation, finish and quality. They are usually relatively small for their age—breed and type considered—and indicate in their appearance a rather low degree of thrift and vitality. Animals of this grade are either very coarse or very refined in their general appearance, and the bones of the legs are very coarse or much too refined. The hair is frequently dry and harsh. The fleshing over the shoulders, crops, back, loin, and rump is thin, and the outlines of the bones in these parts are usually readily perceptible. The fleshing is usually unevenly distributed over these parts. Animals of this grade are usually poor in their appearance and frequently show effects of poor breeding and care.

Inferior grade feeder and stocker steers are very deficient in conformation, finish and quality. They indicate in their general appearance that they are very small for their age—breed and type considered. The hide is frequently very tight and is not pliable. The hair is usually very coarse and dry. The shoulders are frequently coarse, and the bones of the shoulders, back, ribs, loin, and rump are very prominent indicating a very thin covering of flesh. In general appearance, animals of this grade have a poor general appearance and indicate very poor breeding and care.

SEVEN GRADES OF SLAUGHTER STEERS

Grades of Fat Steers: There are seven grades of slaughter steers:

Prime steers are those that have reached such a degree of finish that there is little room for criticism. They are of exceptionally good beef breeding quality. A prime steer is very refined, has small bones in relation to his size, and the hide and hair are of fine quality. In conformation, the animal is blocky, compact, deep, broad with a thick covering of fat that is firm, smooth and well distributed. The head is short and broad, the neck is short and thick and the legs are short and set wide apart.

Choice steers are of pure beef breeding and approach the prime steers in conformation, finish, and quality, except that they are lacking somewhat in the degree of finish and quality, keeping them out of the prime grade.

Good slaughter steers are not so good in conformation, finish and quality. Although they are generally good beef type breeding, they may show slight traces of the dairy type. They are blocky and compact and have good covering of flesh. The good grade steers begin to show a slight coarseness not found in prime and choice grades.

Standard or **Commercial** grade slaughter steers, while they show beef type breeding may have considerable dairy breeding. They are usually deficient in conformation, finish and quality. They show a tendency to become rangy, coarse and angular, with a thin covering of flesh which is unevenly distributed, especially showing thinness in the region of the choicest cuts. They are quite numerous in most markets and often go as feeders instead of for slaughter when the feeder demand is strong. The **standard** applies to the younger cattle whereas, the **commercial** grade applies to mature cattle.

Utility grade slaughter steers are of common or inferior breeding. They are decidedly lacking in conformation, finish, and quality. They are rangy, angular, very coarse; and while poor in flesh, they have just enough to be classified as beef.

Cutter grade slaughter steers are usually of nondescript breeding. They are very inferior in conformation, finish and quality, and carry sufficient flesh in some parts of certain cuts which sell over the block to a cheaper trade.

Canners are usually the scrubs of the crop with no particular breeding. They are so low in quality that the carcass is boned and sold either as canned or diced beef.

These grade names of slaughter steers apply also to slaughter heifers, cows and bulls, except with bulls, prime and low cutter are not used.

Diseases and Parasites

DISEASE CAN LIMIT EFFICIENT PRODUCTION

One of the limiting factors in the efficient production of cattle is the disease problem. A brief discussion of the more common ailments may be of some assistance in solving this problem. However, more information than is given here must be available to the herdsman if he is to guard against diseases in his cattle. The description of diseases and the points emphasized in regard to sanitation may start the caretaker along the right line in securing further information. The services of a veterinarian always should be relied upon rather than to make the mistake of improper treatment of improper diagnosis.

HYGIENE

Most diseases and abnormal conditions are caused by some pathogenic organisms commonly called germs. The organisms are exceedingly small and cannot be seen without the aid of a microscope. Each different disease has its own specific germ. When an animal is affected with a disease, germs are thrown off through the excretions of that animal. These germs are harbored in various kinds of refuse. Some types of germs will live for years

in a cool, dark place. Germs may be killed by sunlight, heat and disinfectants.

While germs are the direct cause of contagious diseases other factors may help a disease get started. Any condition that helps to lower the resistance of the animal will make him more susceptible to diseases. Improper feeding is probably the largest factor in lowering the resistance of animals. Contaminated and insufficient water puts animals out of condition. A lack of sunshine, poor ventilation, poor drainage or any other unsanitary condition helps the germs get in their deadly work.

Any animal sick with a contagious disease should be isolated and given proper treatment. The separation of the sick animal from the rest of the herd is one of the first principles in the control of any disease. Treatment and recovery are more satisfactory when the sick animal is kept to himself. The kind of treatment will depend on the nature of the disease. Whenever the condition is serious the services of a veterinarian should be secured.

TRANSMISSIBLE DISEASES

Actinomycosis (Lumpy Jaw). This disease occurs in several different forms and in different organs, such as abscesses in the region of the throat, in the tongue, in the muscles, in the bones of the jaw and occasionally in the internal organs such as the lungs and the liver. Therefore, lumpy jaw is not a good or correct name for the disease.

It is caused by a fungus and not a germ. This fungus lives on plants such as wild barley. When an animal is affected with this disease and distributes pus which contains the fungus, on plants, this fungus lives over the year and when cattle eat these plants the following year they become exposed to the disease. The disease does not go directly from one animal to another.

The most common form that a beef animal would have is the cold abscess that occurs in the region of the throat. The abscess varies in size up to the size of a man's fist. At first the abscess is a hard swelling, later becoming soft and generally breaking and discharging pus. The abscess is loose in the skin and not fast on the bone. When the abscess form develops and the swelling is small and soft, it may be opened with a sharp knife and tincture of iodine injected. Other cases are surgical and require the services of a veterinarian.

Anthrax. A contagious disease affecting sheep, cattle, horses, hogs, people, dogs, cats and chickens in the order named.

It is caused by the anthrax germ. This germ can form a spore or in other words, put a shell or protective covering around itself. The spore form of the germ may live in the soil for 20 years. The germs are easily killed by sunlight and disinfectants, but after they develop into spores they are very resistant.

Anthrax is a very quick acting disease. In cattle the large animals seem the most susceptible. The bull and the heavy cows are usually the first to die. Most of the sick animals die quickly. Some cattle may live several days

and once in a while an animal will get well. The lingering cases may develop swellings over the body and a bloody serum will ooze out of the skin. Many of the sick animals will pass blood from the nose and rectum.

The best method to diagnose anthrax is to take a blood sample from the dead animal and send it to a laboratory for microscopic examination.

Treatment consists largely of preventive measures. All dead animals should be burned. The infected herd should be quarantined. The cattle should be vaccinated. Cleaning and disinfecting the premises are important. Report all suspicious cases to state authorities.

Blackleg. This is an infectious disease common in young fat cattle characterized by swellings in the heavy muscles and death within 36 hours.

The disease is most common in calves between the ages of 6 and 18 months. Generally the fattest calves are the most susceptible. The first symptom is lameness, a high fever develops, the animal is restless and gives evidence of pain. Swellings develop in the round, shoulder or rump. The animal gets down, goes into a coma and dies. On post-mortem, large swellings in the heavy muscles are found. The swellings are filled with gas. The muscle tissue is black.

Blackleg vaccination is the most perfect of any vaccination in veterinary medicine. Whenever the infection is known to exist on the farm no chances should be taken. The calves should be vaccinated at about six months of age. This will usually protect them until they are 18 months of age.

Shipping Fever. A disease of semi-contagious nature affecting cattle after their resistance has been lowered by some other condition. It is common in calves during the winter months. The disease is caused by a germ common to all barn lots. In fact it may be found in many normal animals. When an animal's resistance is lowered by shipping, by lack of feed, by improper housing or running in stalk fields in bad weather, he becomes a fit subject for **hemorrhagic septicemia**. A most important predisposing cause is damp quarters. If the bedding is not changed frequently it will become foul and damp. If the barn is drafty and the wind blows over the cattle they will lose their resistance.

An animal affected with shipping fever may develop a fever. Usually there is a loss of appetite. An inflammation of the lungs or pneumonia may develop and this will produce a cough and difficult breathing. Digestion is upset which may produce diarrhea. Frequently blood is passed in connection with diarrhea. The sick animal may die quickly or linger along for some time, possibly getting well.

Treatment is largely a preventive problem. If resistance can be kept up by proper feeding, housing, care and management, there will be little cause for shipping fever. A cow or calf affected with the disease should be blanketed. A light diet such as a mash made of low grade flour and bran should be fed. All feeding utensils should be sterilized by scalding. The sick animal should be placed by itself. Antibiotics and sulfa drugs are being used in

treatment. The services of a veterinarian are advised in the treatment of the sick cattle.

Brucellosis. A contagious disease caused by the bacillus of Bang characterized by the premature birth of the calf. The germ that causes abortion disease is very resistant to weather conditions and will live a year or more if kept away from sunlight. It is readily killed by sunlight and disinfectants. The germs are thrown off by the affected cow through the dead calf, afterbirth, all discharges and secretions—including milk.

Most abortions occur in young animals just before they are to freshen the first time. Most cows abort only once and then build up an immunity against the disease. A retained afterbirth in connection with abortion is a symptom of contagious or infectious abortions. Some of the cows will be hard to "settle" after aborting. The course of the disease in a herd is usually three or four years.

Abortion disease is spread very largely through contaminated feed, just the same as other diseases, such as hog cholera and tuberculosis. While the possibilities of the spread of the disease through breeding operations should not be disregarded, this method of spread is much less important than that through contaminated feed and water.

All cows affected with this disease should be isolated. When a cow shows symptoms of abortion she should be put by herself and kept there until all symptoms disappear. The stall or pen should be thoroughly cleaned and disinfected. All dead calves and afterbirth should be burned. Cows which abort should not be bred for 60 days after aborting.

When abortion disease is suspected in a herd it is advisable to have the herd tested in order to diagnose definitely the disease and to pick out the animals which are infected. Of course, this test should be done by a veterinarian. In fact, his advice should be relied upon whenever this disease breaks out in a herd. Heifer calves between the ages of four and eight months should be vaccinated.

Infectious Ophthalmia (Pink Eye). This is a contagious disease affecting the eyes. It is brought into the herd by new infected animals. It affects old and young alike. It is seldom seen during the winter months, but may persist during the summer months for several years. The disease is characterized by a discharge from the eyes and a swelling of the eyelids. In many cases the animals temporarily go blind, and fever develops. This is accompanied by a loss of appetite, partial loss of milk and separation from the herd. It is evident from the character of the disease that prevention means the isolation of sick animals and keeping sick animals from entering the herd. The sick animal should be put in a dark, cool stable, with plenty of fresh water and a light diet. The eyes may be washed out with a weak solution of boric acid or treated with antibiotic preparations for this purpose. Vaccination will prevent about 50 per cent of the cases and may keep some of the cattle from having it as hard as they otherwise would.

PARASITIC DISEASES

Flies. Many different species of flies infest cattle. Some are bloodsuckers and carry diseases such as anthrax from one animal to another. Flies are injurious to cattle on account of annoyance, pain and loss of blood due to bites.

As soon as the fly season starts during the summer beef calves should be kept in a dark place in the barn during daylight hours. Some difficulty may be experienced in keeping a calf blanketed, but if it is possible to do so the calf should be blanketed.

A wettable DDT powder used at .5 per cent concentration made up by adding 8 lbs. of 50 per cent wettable DDT powder to 100 gallons of water and sprayed on the animals and building walls has proved to be a satisfactory fly control method.

Lice. These parasites feed from the skin of the animal and cause considerable irritation. The infested animal spends most of his time scratching and rubbing. A general unthrifty condition results if the animal is badly infested.

DDT used at the same strength as for fly control gives a satisfactory control of lice. Benzene Hexachloride or commonly known as BHC, mixed at the rate of 4 lbs. of a 6 per cent gamma isomer wettable powder to 100 gallons of water has also proved satisfactory. Either treatment used should be sprayed on the animals preferably under high pressure sprayers. If a high pressure sprayer is not available, a low pressure sprayer can be used, although the results may not be as satisfactory.

Ringworm. An infection of the skin caused by a vegetable parasite. It is highly contagious and spread by contact. It is most common in calves during the winter. It forms circular patches on the skin, especially on the head, which soon becomes bare of hair and is attended with more or less itching. It is communicable to man. To control ringworm remove all crusts by washing with soap and water. Apply sulphur ointment or tincture of iodine once a day. Clean the stable and whitewash it to destroy the spores scattered by the crusts.

Warbles or Grubs. Swellings about one inch in diameter develop on the backs of cattle caused by the warble. The adult of this warble is the heel fly. The heel fly lays eggs on the hairs of the legs of cattle. When the eggs hatch into small grubs they burrow into the skin and finally lodge in the back. A hole is cut in the skin by the grub for breathing purposes. After the grub is fully developed it crawls out through this hole falling to the ground where it hatches into the heel fly. These warbles or grubs are common in the backs of cattle during early spring. The grubs should be squeezed out of the cattle during early spring, and destroyed. When treating a small number of cattle for grubs, a dust is the simplest method. A 5 per cent rotenone powder should be used. It is applied from a shaker top can with quarter-inch holes and gently rubbed in a rotary motion with the finger tips as it is being applied. Treat 30 days after first grubs appear in the back. Follow up the treatments should be made every 30 days thereafter, making four treatments. For large herds, high pressure sprayers are generally used.

OTHER ABNORMAL CONDITIONS

Footrot. An inflammation of the foot between the toes caused by the irritation of filth. Lameness is a symptom as well as swellings above the hoof, foul odor, and pus accumulation beneath the horn. Marked loss of weight results if cases are neglected. Early treatment is important. Sulphanamides and antibiotics are common treatments. Prevention involves keeping the lots dry and the feet clean.

Keep the feet clean and provide exercise.

Bloat. An excessive amount of gas in the paunch brought about by some digestive disorder. The immediate cause is often from eating a large quantity of easily fermentable feed such as fresh clover or alfalfa pasture, green corn or even alfalfa hay or clover hay. If cattle are pastured on wet clover or alfalfa, bloating is likely to take place. Alfalfa pasture is not safe for cattle at any time. Bloat is easily recognized by a pronounced swelling on the left side. The animal often recovers without treatment, but should be watched closely. If the animal becomes distressed or breathes hard then some emergency treatment must be given or death may result. Two ounces of aromatic spirits of ammonia in a pint of cold water may be given as a drench. If this is not available, turpentine may be used in the same proportion. Exercising the animal may help. Placing a bit in the mouth may start the animal belching. In extreme cases it is necessary to tap the animal on the left side. This is done by inserting a trocar in the center of the triangle formed by the last rib, backbone and hip bone.

Diarrhea. In the simple form is caused by irritation of the intestines from improper feeding or chilling. If the condition is allowed to continue the animal becomes thin and dull. The cause should be removed. Calves may be given one to two ounces of castor oil in one-half pint of milk. Cut down the quantity of feed and provide comfortable surroundings.

Pneumonia. A common condition affecting young cattle during the winter months. It is especially prevalent during cold, damp weather and among calves which are subjected to considerable exposure because of poor housing. The characteristic symptoms are a fever, difficult breathing and a pounding pulse. One or both lungs may be affected. The animal shows little disposition to lie down. Frequently there is a running at the nose. Treatment should be prescribed by a veterinarian. Keep the animal quiet, covered with heavy blankets and absolutely free from drafts. If it is possible to put the animal in a heated building, do so.

Warts. The presence of a few warts does not usually interfere with the health of the animal, but may be classed as a nuisance. They may appear most anywhere on the body. The slender warts may be cut off with a pair of scissors observing sanitary precautions. Others will usually disappear if tincture of iodine, glycerine or glacial acetic acid is applied to their surfaces daily. Another remedy is seven parts of collodion and one part of salicylic acid. Veterinarians have a vaccine which may be used.

**AMERICAN BEEF CATTLE
REGISTRY ASSOCIATIONS**

American Aberdeen-Angus Breeders' Association—
3201 Frederick Boulevard, St. Joseph, Missouri.

American Hereford Association—300 West 11th St.,
Kansas City, Missouri.

American Polled Hereford Breeders' Association—
Farm Bureau Building, Des Moines, Iowa.

American Shorthorn Breeders' Association—7 Dexter
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