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Baby Beef : A Manual for 4-H Club Members

I. B. Johnson

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BABY BEEF
A Manual for 4-H Club Members
by
I. B. JOHNSON

SOUTH DAKOTA STATE COLLEGE
EXTENSION SERVICE
C. LARSEN DIRECTOR
BROOKINGS, S. D.
Foreword

Beef cattle production offers one of the most satisfactory means of utilizing our western ranges, and cattle feeding affords our farmers in the corn and grain producing areas of the state the opportunity of marketing their grains and roughages in a practical and profitable manner. Business success depends largely on supplying the commodities that people demand. This applies to the business of breeding and feeding beef cattle the same as to any other business. The American consumers have shown an ever increasing demand for the smaller retail cuts of meat of good quality and not too fat. Such cuts are readily obtained from the carcasses of younger beef cattle as under ordinary feeding conditions they do not put on an excess of fat.

Twenty or twenty-five years ago the consumers’ demand required larger cuts of meat and it was not uncommon to find the older, heavier cattle, weighing from 1500 to 1800 pounds, commanding the higher prices on the livestock market. Today there is only a limited demand for these heavier cattle and the market can be easily over supplied, as the outlet for them is afforded by the hotel trade, the army and navy and the limited export trade. The chief demand now is for steers weighing from 850 to 1100 pounds. These younger cattle not only enable the grower-feeder to sell more beef per cow, but make cheaper gains and afford a wider choice of markets.

While this circular was prepared for the use of members of the 4-H beef clubs, there are helpful suggestions to others engaged in cattle feeding. The 4-H beef clubs offer advantages and training for their members that can be obtained in no other way. The members gain ability as judges of livestock and as buyers of feeder cattle and feeds; they acquire a practical knowledge of the care, management, the economical feeding and the marketing of beef cattle. At their club meetings they secure training in parliamentary practice, in cooperative effort, and in being able to think and talk intelligently on farm problems. Their calves, too, serve as a demonstration in their communities in the use of South Dakota feeds in producing good beef.
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Selecting the Beef Animal

“What is the best breed of beef cattle?” This is a question that is frequently asked. Correctly answered it would be “There is no best breed.” There are differences in breed characteristics but there are considerably more differences between individuals within the breeds. Therefore, select the breed that is best liked, especially if it is a breed of beef cattle prevailing in the community or territory, as there is a better chance then to secure breeding stock, to sell surplus breeding animals, and to gain useful information from neighboring stockmen on the problems of the business. Then too, the general production of one breed of beef cattle in a community or territory establishes the community as a source for that particular breed of cattle and attracts more buyers for either breeding or feeding stock.

Breeds of Beef Cattle

It has taken many years to develop breeds of beef cattle. There are 21 principal breeds of cattle but only a few of them are of the beef type. The beef breeds of cattle of importance in the United States are the Shorthorn (both horned and polled), Hereford (both horned and polled), Aberdeen Angus, and Galloway. Each of these breeds has been carefully selected and bred for a long period of years. As a general thing the beef breeds are not heavy milkers and in this point lies their success as desirable producers of beef. There are a few dual-purpose breeds that are common in the United States. These dual-purpose animals are supposed to produce both beef and milk. It is true, however, that some will be prominent either in beef production or in milk, but not many of them are prominent in both.

Shorthorn.—Shorthorn cattle are more extensively grown in the United States than any other beef breed. They are able to adapt themselves to different conditions and do well almost anywhere, but respond best where the grasses are abundant and the feed plentiful. They develop a good growth, mature early and fatten readily; they are quiet in the feed lot. The Shorthorn produces more milk than any of the other beef breeds, and is therefore favored on many small farms to supply milk for the family in addition to raising a calf for beef. Any criticism of the breed would be the inclination of some individuals to legginess, lack of fullness in the crops, depth of twist, and lack of uniformity in type and appearance. The fat or finished animals may show a patchiness at the tail head and “rolls” at the loin edge and over the ribs.
The cattle are horned, the horns being short, curved forward with the tips pointing inward and sometimes downward. The Shorthorn may vary in color from all red or all white to any combination of red and white; the blending of the red and white hairs produces a roan color that is popular. A muzzle that is of smoky or black color is objectionable. The Shorthorn is the largest of the beef breeds. When raised under favorable conditions the mature bulls weigh between 1800 and 2400 pounds, and the cows usually weigh from 1300 to 1700 pounds. In form the Shorthorn is more rectangular than the other beef breeds, due to the great width of back, depth of body, and the straight top and underline. On an average they are not as low set as the Angus and Hereford. They are regarded as having a strong constitution except for those individuals which lack spring of rib and depth of chest. They are of quiet temperament and mild disposition and outrank the other beef breeds in quality of hide, hair and bone.

Polled Shorthorn.—This breed is identically like the Shorthorn in every respect except that it is hornless. It is a comparatively new breed, but has been increasing rapidly in recent years. There are some advantages to polled animals in that they do not have a chance to injure each other as readily.

Hereford.—The Hereford ranks next to the Shorthorn in numbers in the United States. Herefords are known for their rustling ability and have found favor under range conditions. They are also known for their ability to produce beef economically in large scale production on farm or ranch. They do well under adverse conditions and respond quickly to favorable conditions. They are early maturing and no breed is more popular with the cattle feeders. The breed may be criticized on account of the tendency of some individuals to show a heavy brisket, an excessive dewlap, a peaked rump, or light quarters.

The Hereford cattle are horned, the horns are of medium size, extend out at right angles from the head, curving downward and slightly forward. Horns with black tips or with tips turning upwards are not desirable. The Herefords have a distinct and uniform color which has made them known as “white faces.” The principal body color is a medium to deep rich red with a white head, breast, belly, flank, crest, switch and legs below the knees and hocks. White occuring back of the crops, high on the flank or too high on the legs or black hair mixed in the switch is objectionable. They are a close second to the Shorthorn in size, but their conformation makes them appear smaller than a Shorthorn of equal weight. Mature bulls weigh from 1800 to 2300 pounds and cows from 1200 to 1600 pounds each. The Hereford possesses a good beef type conformation; the middle and quarters are more rounding than those of the Shorthorn but not as rounding as those of the Angus. They are lowset, compact, blocky and have a good spring of rib. They are rugged and hardy with ample vigor, yet they are of quiet and docile temperament. They possess medium quality, sometimes having a thick hide and occasionally “ties” in the back.

Polled Hereford.—This is a new breed of cattle that has been developed by mating Hereford cattle that are naturally polled. The popularity of polled cattle is steadily increasing, especially on small farms. The breed characteristics of the Polled Herefords are exactly the same as that of the Herefords, except they are hornless.
Aberdeen Angus.—This breed of cattle was introduced into the United States considerably later than the other two breeds mentioned, but its popularity has been increasing very rapidly, and at the present time these cattle are found in nearly every state. They are good rustlers but have not shown the ability to fatten on roughage alone without concentrates as have the Herefords. The Angus cows are better milkers than the Herefords but not as good milkers as the Shorthorns. Angus cattle are early maturing and tend to fatten well at any age; they have a high dressing percentage and produce a superior carcass that is firm and well marbled. Criticisms against the breed would be the more nervous disposition, the prominence of shoulder and the flatness of ribs.

The Angus cattle are hornless or polled, the poll being sharp and tapered. They are of a solid black color. A purebred Aberdeen Angus that is red in color or that has white except to a moderate extent on the under-line behind the navel is not eligible for registry. The breed ranks third in size being smaller than the Hereford and Shorthorn; mature bulls weigh from 1800 to 2100 pounds and cows from 1200 to 1500 pounds each. In form the Angus is lower set, more compact and blocky than either of the other beef breeds; the body is smoother and more cylindrical in shape and the breed is more uniform in type. They are not as mild and quiet in disposition, but are superior in beef quality as they have the ability to mix fat and lean to a degree wherein the flesh remains firm and smooth.

Galloway.—Galloway cattle are not as common as the other beef breeds. They are a very hardy breed that can withstand severe winter conditions and are exceptionally good rustlers. They are not as popular in the corn belt because of their inability to respond readily to good feeding and management. Their hides make high class robes and coats. The breed is criticised on account of coarseness about the head and in the hide and bone, and for being flat ribbed and of smaller size.

These cattle are polled but the poll is not as sharp or prominent as in the Angus and the head is covered with long wavy hair. They are solid black in color with perhaps an occasional brownish tinge. They have long wavy hair which is underlaid by a somewhat silky coat of short hair. White markings above the underline or white feet and legs make the cattle ineligible for registry. In size the Galloway is smaller than any of the beef breeds, mature bulls weighing from 1700 to 1900 pounds and the cows from 1000 to 1300 pounds each. In conformation the Galloway is deep and low-set, but flatter of rib and longer of body than the Angus.

Dual Purpose Breeds.—There are two principal dual-purpose breeds of cattle common in the United States, known as the Milking Shorthorns and the Red Polled. Dual-purpose breeds have been bred to produce cows that
Excellent Type Purebred Beef Bulls

1. The Shorthorn—
the largest of the
breeds.

2. The Hereford—
rugged, hardy and a
good rustler.

3. The Angus—not-
ed for uniformity and
smoothness.
Breed Type Is A First Essential

4. The Shorthorn—the farmer's cow.

5. The Hereford Cow—the favorite of the range.

6. The Angus Cow—superior in beef quality.
yield a good quantity of milk and produce offspring that would be desirable for beef. As the type of animal necessary for the production of large yields of milk is entirely different from that of the beef cattle, it has been impossible to produce a breed which would combine these functions and be of superior merit for both purposes. The dual-purpose cattle are popular with the small farmer who keeps but a few head and must depend upon them to produce all the milk and butter needed for the family and at the same time raise calves or steers which will sell readily for slaughter purposes. They have not been popular with ranchmen or cattle feeders who raise cattle in large numbers.

Selecting The Feeder Calf

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 beeves. Especially is this 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 purebred, 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, 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. An idea of its conformation can be gained 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 lowset and not leggy. When viewed from in front he should be wide between the eyes, have a short face and a large muzzle, these being the 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 underline will not develop into a tidy baby beef as these faults usually become more pronounced as the animal fattens. Select a calf that is of quiet disposition, for the nervous calf runs off too much flesh. The calf should have quality as indicated by a loose pliable skin, a clean bone, an even covering of rather firm flesh.

Many a 4-H club member can recall how well formed his calf was at the start but somehow it did not develop and feed out as hoped for. This traces directly to the breeding back of the calf and emphasizes all the more the necessity of getting well bred feeder calves of strictly beef breeding.
Selecting Foundation Stock for the Beef Herd

The 4-H beef club member who has had several years of experience in successfully feeding out calves for baby beef may want to raise beef cattle either for feeders or for breeding stock. The 4-H purebred beef heifer club offers such a member an opportunity of getting started in the cattle business with good beef foundation stock. Herds of purebred livestock are needed in every community to at least furnish the good purebred sires required by the farmers for grading up their herds. As a rule, purebred livestock matures earlier, fattens easier, gives more returns 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. The raising of 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.

The Cow or Heifer.—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 the good beef cow or heifer should have the beef form, being lowset, 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 a 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 fleshe, the hips and rump level and well covered. There should be uniformity in width of top line over the back, loin and rump. The quarters should be well fleshe, the twist deep and both fore and rear flanks should be low. The cow should show a sufficient udder development to indicate the ability to nurse the calf for at least six months. The animal should be of 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.

The Bull.—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 hundred-weight on the market. "One pays for a good purebred bull whether one uses it or not" is a statement chock full of truth. Only good purebred beef bulls should be used on our herds of beef cattle. 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 of burly 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 long, level and of good width. The quarters and twist
should be well developed. The hind legs should not be bowed or sickle-hocked but should be placed squarely under the hind quarters. The bull should have an easy carriage, good handling quality and be of a docile or quiet temperament.

Fig. 7.—The Main Points of a Pedigree.

A graphic representation of the relative importance of the ancestors in the first four generations. It is quite as important to know what sort of animals make up the later matings as it is to know to what family the animal belongs. Beyond the fourth generation the influence of any ancestor is so slight that for practical purposes it may be ignored.

(Courtesy U. S. Dept. of Agriculture.)

The Pedigree.—Before finally selecting as foundation stock a purebred individual or individuals 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.

The foregoing sketch shows graphically a four generation pedigree, bringing out the relative importance of the sire and dam, the grandsires and granddams, the great grandsires and great granddams, etc. This pedigree shows 30 ancestors, all of which may be different individuals unless there may have been some line breeding in the development of the animal. The young stockman's success as a breeder of beef cattle will depend not only upon his ability as a judge of cattle, as a feeder and as a manager, but also upon his knowledge of pedigrees and his familiarity with the weaknesses as well as the strong points of the ancestors of his animals. Such information equips him with a practical working knowledge of pedigrees.
Feeding

In feeding cattle the feeder has an opportunity to raise or increase the market grade of the animals in the feed lot. For instance, feeder calves grading good may be fed so skillfully as to grade as prime yearling steers. A few practical suggestions for economical feeding are here listed:

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. Pasture will not help to fatten a baby beef club calf.

Grains

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. As 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. Where hogs do not follow the cattle in the feed lot, the coarse grinding of corn is preferable.

Ground ear corn (known as corn and cob meal) gives good results. 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 excell 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. Grinding shelled corn coarsely is a popular method of preparing the corn with 4-H club members.
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.

Boiled barley is most satisfactory, providing it is not permitted to sour and the feed boxes are kept clean. To prepare it place what barley is needed for the day's feed in a kettle with water, keep a slow fire under it and permit it to come to a boil. Another method is to put a feed of barley in a pail, pour scalding water over it, and cover the pail with empty sacks so as to allow the grain to steam thoroughly. It is well to start the calves on boiled barley by May.

Wheat.—This grain is not commonly fed to cattle unless it is off grade or unusually low in price. It is not quite as good a fattening feed as corn for it is less palatable. Coarsely ground wheat is better than finely ground wheat.

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 indicated 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 that is revolutionizing the feeding of beef cattle. 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. Alfalfa is so plentiful in South Dakota that it seems unnecessary to advise its use, but on the other hand many cattle feeders do not realize its value. Calves should be started gradually on alfalfa hay otherwise they may scour.

**Sweet Clover Hay.**—When fed with corn silage, sweet clover hay has considerable value. However, it is not as palatable as alfalfa hay. There may be some difficulty in getting steers to eat sweet clover hay. Another point should be kept in mind and that is the possibility of producing the sweet clover disease which is a result of the mold on sweet clover hay.

**Prairie Hay.**—This hay which is common in South Dakota may have a place in the fattening of steers. The feeding value is much higher than timothy hay. If supplied in connection with alfalfa it is quite valuable as a supplement to the rich alfalfa.

**Corn Fodder.**—This feed does not have a great deal of value as a fattening feed for feeder calves. It may have a place in a fattening ration for steers as it is available on most farms. 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 or 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.

**Sudan Grass Hay.**—The feeding value of sudan grass hay is about equal to that of prairie hay. It should not be used as the sole roughage in a fattening ration for cattle but gives best results when fed in connection with a legume roughage.

### Protein Supplements

Usually 100 pounds of a protein supplement in a fattening ration for beef cattle save from 250 to 300 pounds of corn. If 100 pounds of the supplement costs more than the grain it replaces, its value in the ration may be questioned where a legume hay and corn silage is being fed. In baby beef club work, however, it is generally profitable to include a protein supplement in the ration because of more rapid 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 the cattle and gives them a sleeker appearance which usually results in 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 that is widely used as a supplement to fattening rations deficient in protein. There is a possibility
that an excess amount of it might be poisonous; however, if the ration is properly balanced with corn, oats, etc., there should be no difficulty from this standpoint. 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 as this should be sufficient to balance the ration. There is probably some advantage in feeding cottonseed cake as compared with cottonseed meal, especially when the calves refuse the meal at the start of the feeding period.

Fig. 9.—A County Group of Baby Beeves—Entered at the State Fair, 1931.

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. Wheat bran is usually available while other supplements are sometimes difficult to get. It is widely used among showmen because of its beneficial effect on the animal's digestive system.

Flaxseed.—In certain sections of the state flaxseed is available as a protein supplement, but when used, it should by all means be ground. It is more difficult to feed than other supplements and care must be exercised in its feeding or the calves will go off feed. At feeding trials at the South Dakota Experiment Station ground flaxseed proved an effective supplement in feeding baby beeves. The 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 preferable to feeding them coarsely ground or as a meal. Not over two pounds per head daily should be fed. Cattle may tire of the beans after a 60 or 90 day feed and some other protein supplement should then be substituted for them.

Miscellaneous

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. More economical and rapid gains can be secured if the feeder
calf is permitted to suckle a cow at least until it has learned to eat grain. Baby beef club calves should not be allowed milk after they are eight months old.

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

Minerals.—In some sections of the state it may be advisable to allow the feeder calves access to a mineral mixture consisting largely of equal parts of high grade ground limestone and steamed bone meal. The limestone will furnish some lime, and the bone meal some phosphorus for the building of bone and vital tissues in the animal’s system. Do not spend money for all kinds of minerals, remedies and other preparations that are on the market. It may be possible that some of these have value but generally speaking they cost more than they are worth. Plenty of salt, lots of water and plenty of the right kind of feed is possibly the best “mixture.”

Where feeder calves are getting a ration of corn, a protein supplement and silage, it is possible to fatten them without a legume hay by using finely ground limestone with a high calcium carbonate content to replace the hay. This was clearly demonstrated in a three-year feeding trial at the Kansas Experiment Station. The 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.—Common barrel 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 at the salt at any time. Common block salt is not as good as barrel salt for the reason that it is more difficult for the calf to secure the proper amount. It should not be necessary for the calf to spend this extra time in licking at a solid block. Furthermore, block salt is more expensive than ordinary barrel salt. Too many times these blocks of salt are sold on the theory that they contain various kinds of tonics and medicines which are valuable to animals. In some cases sulphur has been added to block salt with an idea of keeping off flies, not off the salt but off the animal. Such a theory is absurd.

Water.—It is extremely important that cattle have water at all times. A large part of the body is made up of water and cattle cannot take on flesh unless a sufficient amount of water is before them constantly. The water should be clean and fresh. In the winter time it should be warmed. The calf should not be expected to drink water out of a tank filled with ice.

**Feeding for Beef Production**

The feed and care which the baby beef calf gets during the fall and winter will have a lot to do with the 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 it should be remembered that one of the main factors in successful baby beef feeding is
to get the calves to put on fat or finish rather than to make excessive 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.

Starting on Feed.—It is preferable to have the calf started on feed before weaning and when the 4-H club member finds it possible the feeder calf may well be allowed to nurse the cow until it is eight months of age. Start the calf on feed gradually and any increase made in the amount of feed given at any time or the kind of feed used should be made gradually. It is important not to make any sudden changes in the feed which will cause scours or digestive disorders. The calf that eats regularly with a good appetite will gain and fatten better than one that scours or goes “off feed” from time to time.

Equal parts shelled corn and oats will make a good grain mixture to use in getting the calf started on feed. 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. If the calf has not been accustomed to eating alfalfa or clover hay use very small amounts of these feeds at first.

The calf needs protein or growth materials to make growth but one should be careful in supplying these not to use feeds which are too bulky. If the calf has to eat a large amount of oats to get the growth material it needs then it will not be able to eat enough corn or barley to put on the fat or finish desired. Calves fed at the South Dakota Experiment Station which received one-tenth oats in their ration did not make as rapid gains or develop as much “finish” as calves which got corn and linseed oilmeal
without the oats. It will be good practice to gradually take the oats out of the ration after the first three or four weeks and use a small amount of linseed oilmeal instead.

Keeping Records.—When the calf has been weighed into the 4-H club contest, accurate feed and labor records should be kept. 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 in-so-far 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.

Suggested Rations.—Rations for a calf might well consist of corn, oil meal, silage and alfalfa hay. Other feeds, of course, may be substituted such as barley for corn. When available, oat straw might be kept before the calves. A little prairie hay might be used instead of oat straw. It has been found at experiment stations that rations consisting of grain, some kind of oil meal, a succulent feed, and a legume hay generally produce the best results. Following are some rations that might be used and are figured on the basis of 1000 pounds liveweight of the animal. A 500-pound calf would receive half this amount daily.

<table>
<thead>
<tr>
<th>No. 1</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>15</td>
</tr>
<tr>
<td>Linseed meal</td>
<td>2</td>
</tr>
<tr>
<td>Alfalfa hay</td>
<td>5</td>
</tr>
<tr>
<td>Corn silage</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. 2</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn and cob meal</td>
<td>18</td>
</tr>
<tr>
<td>Linseed meal</td>
<td>2</td>
</tr>
<tr>
<td>Sweet clover hay</td>
<td>5</td>
</tr>
<tr>
<td>Corn silage</td>
<td>10</td>
</tr>
<tr>
<td>Oat straw or prairie hay, unlimited.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. 3</th>
<th>Pounds</th>
<th>Parts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Barley</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Cottonseed meal</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Alfalfa hay</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No. 4</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>14</td>
</tr>
<tr>
<td>Oats</td>
<td>5</td>
</tr>
<tr>
<td>Sweet clover hay</td>
<td>5</td>
</tr>
<tr>
<td>Corn silage</td>
<td>10</td>
</tr>
</tbody>
</table>

These rations are average for the main feeding period. A smaller quantity of grain is fed at the start and is gradually increased throughout the entire feeding period. Corn may be increased at the rate of one pound a month, or more if the calves will take it. Starting with one-fourth pound a day, linseed meal may be increased to two pounds a day. If silage is fed, a light ration is given at first, which is increased as rapidly as the calves will take it until the last six weeks of the feeding period, when it is decreased so that the grain ration may be increased. A well balanced ration helps to keep the calf healthy, shortens the fattening period and gives a higher finish than can be secured with unbalanced rations.

Feeding Suggestions.—The calf should be fed twice a day during the first half of the feeding period and beginning about May 1 it will be advisable to feed it three times each 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 onto full feed again in three or four days time.

### WEIGHTS OF FEEDS

<table>
<thead>
<tr>
<th>Feed</th>
<th>One Quart weighs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn (shelled)</td>
<td>1.7 lbs.</td>
</tr>
<tr>
<td>Corn (ground)</td>
<td>1.5 lbs.</td>
</tr>
<tr>
<td>Corn and cob meal</td>
<td>1.4 lbs.</td>
</tr>
<tr>
<td>Barley (ground)</td>
<td>1.1 lbs.</td>
</tr>
<tr>
<td>Emmer (ground)</td>
<td>0.9 lbs.</td>
</tr>
<tr>
<td>Oats (whole)</td>
<td>1.0 lbs.</td>
</tr>
<tr>
<td>Oats (ground)</td>
<td>0.7 lbs.</td>
</tr>
<tr>
<td>Rye (ground)</td>
<td>1.5 lbs.</td>
</tr>
<tr>
<td>Wheat (ground)</td>
<td>1.7 lbs.</td>
</tr>
<tr>
<td>Wheat bran</td>
<td>0.5 lbs.</td>
</tr>
<tr>
<td>Cottonseed meal</td>
<td>1.5 lbs.</td>
</tr>
<tr>
<td>Linseed meal</td>
<td>1.1 lbs.</td>
</tr>
<tr>
<td>Soybeans</td>
<td>1.8 lbs.</td>
</tr>
<tr>
<td>Molasses</td>
<td>3.0 lbs.</td>
</tr>
</tbody>
</table>

Permit the calf to have access to salt; also give it plenty of clean water. It is a good practice to turn the calf loose in a lot or barnyard a part of each day in winter when weather conditions are suitable, in order that it may get exercise and be out in direct sunlight. The bedding also should not be overlooked. This should be provided in amounts sufficient to keep the calf clean and comfortable. The calf that is comfortable and contented will do better than one which is restless and uncomfortable.

### Feeding the Heifer Calves

The feeding of heifer calves in 4-H club work 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 contest would be different than 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:

<table>
<thead>
<tr>
<th>No. 1</th>
<th>No. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn (ground)</td>
<td>Corn (ground)</td>
</tr>
<tr>
<td>Oats (ground)</td>
<td>Oats (ground)</td>
</tr>
<tr>
<td>Linseed meal</td>
<td>Wheat bran</td>
</tr>
<tr>
<td>4 parts (by weight)</td>
<td>3 parts (by weight)</td>
</tr>
<tr>
<td>3 parts (by weight)</td>
<td>2 parts (by weight)</td>
</tr>
<tr>
<td>1 part (by weight)</td>
<td>1 part (by weight)</td>
</tr>
</tbody>
</table>

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
BABY BEEF

each hundred pounds of liveweight. At the beginning of the contest, April 1, weigh the animal, keep accurate account of the feeds fed and increase the feed until the heifer is getting from $1\frac{1}{4}$ to $1\frac{3}{4}$ pounds of the grain mixture for every hundred pounds liveweight. She should also have what silage and alfalfa hay she will clean up daily. During the summer when pasture is available permit her to have the run of a small pasture, but continue with the grain and alfalfa hay.

When the heifer is from 20 to 24 months old she should be bred to a good purebred beef bull.

Care and Management

The care and attention that a club member gives his calf will largely determine his success as a feeder. A good calf in poor hands will not develop properly. A poor calf in good hands is a better combination but the best combination, of course, is a good calf in good hands.

Feeding Equipment.—The calf should be kept in a box stall. A calf that is being fattened should not be tied; he will do much better if he has the run of a box stall. This need not be especially warm but needs only to be dry and the calf should be protected from rain, wind and snow. The stall should be cleaned out every day. Heavy bedding should be put in each day after the stall is cleaned. Bedding is cheap and helps to cut down the feed bill. The feed box should be low enough so that the calf can get at it easily. Probably the box need not be over a foot from the floor; it should be six inches in depth. Some of the experienced club members put the feed box on the floor as this helps to develop stronger backed calves; heavy shou­dered calves though, will develop more coarseness in the shoulder if fed too close to the ground, so use judgment as to where the feed box is placed.

During the winter months allow the calf a small lot for exercising during the day. When warmer weather approaches permit the calf 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.

Castrating the Calf.—It is preferable to secure 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 affords them a little better opportunity of developing than if they were castrated too young. Castration is an operation that should be performed by an experienced person. If a knife is used treat the wounds with an anti­septic solution. Too many calves have died as a result of blood poison after
castration. Keep the calf in a cleanly bedded stall and examine the scrotum daily for the first week after castration to make sure that the wounds are draining properly.

**Breaking the Calf to Lead.**—A calf should be broken to lead at a very early age. Do not make the mistake of letting the calf go too long before this is done. 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 attempt to lead him, turn him to one side. With a little practice and patience most calves will soon learn to be led. There are calves that are wild but they are the exceptions. Do not let the calf break away from you when leading him as he will attempt to do the thing again. After he has once been broken to lead he should be led quite frequently, every day if possible. A calf that leads well is a lot of satisfaction when taken into the show ring. Do not put this off. Break him to lead as early as possible.

**Making a Rope Halter.**—A simple rope halter should be made by each club member for 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 five-eighths inch rope will be sufficient for one halter. First make the loop splice and then the eye loop. The distance between the two should be 18 or 20 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 as shown in upper right hand illustration. Pass the long end or lead rope through the opening under these strands. Now raise two strands in the long part of the rope as indicated by the marlin spike in the same illustration and pass the short end of the rope through this opening. Draw the ropes closely together as shown in the lower illustration of this loop splice. 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 as indicated in the upper illustration of the eye splice, 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 main part of rope. Bring rope back into position as first held, raise the third strand of 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 splice 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 or crown knot should be put in this end of the rope to prevent it from raveling, the foregoing illustration showing how this is made.

Making a Blanket.—Flies will begin to get bad in June or July and if some other protection from them is not provided the calf will need a blanket. Blanketing the calf will also help to improve the handling quality of the skin, but calves which will show best with a heavy coat of hair should not be blanket ed. Two burlap bags will produce a very serviceable blanket if cut open at the seam and sewed together along the longest edge. Two tie strings may be attached to each of the four corners of the blanket as illustrated. The tie is then made by passing the strings around each leg and loosely tying them in a bow knot. Some may wish to use sursingles on the blanket, but they are not as desirable because they keep the blanket too close to the animal’s body and do not permit as free circulation of air between the blanket and the body.
If desired, a more attractive blanket may be made from unbleached muslin or a light weight canvas. To determine the proper size of blanket to make, the club member should measure his calf lengthwise from a point about five inches in front of the shoulders back to the root of the tail, and over the crops from the elbow on one side to the elbow on the other side. All the edges may then be folded back and thoroughly stitched to prevent fraying. Some members may want to print the name of the calf, their own name or possibly the name of the club on the blanket. With the aid of some stencil letters, this can readily be done with a small brush and paint.

**Regularity in Care and Feeding.**—The club member who is regular in the feeding and care of the calf will be able to show a better record at the close of the feeding period than a member who is irregular. Have certain hours at which the calf is to be fed; during the warm weather water should be offered the calf three times daily. Keep salt before the calf at all times. Keep the stall clean and use lots of straw for bedding. Brushing the calf a little each day and currying it when necessary helps to keep the skin and the coat of hair in better condition and gives the club member the earmarks of a good herdsman. The condition of the calf at the end of the feeding period and at the fairs and shows will be determined by its feed, care and management.

**Diseases and Parasites**

*By Dr. G. S. Weaver, Extension Veterinarian*

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 or 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 principals 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 and 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 in some instances 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.

Fig. 15.—Anthrax Takes Its Toll Through Periodical Outbreaks.

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 has the power of forming a spore or in other words putting a shell or protective covering around itself. The spore form of the germ may live in the soil for twenty 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 of diagnosing anthrax is to have a blood sample taken from the dead animal and have it sent 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.**—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 months 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 with blackleg aggressin or blackleg filtrate at about six months of age. This will usually protect them until they are 18 months of age.

**Hemorrhagic Septicemia.**—A disease of a 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 that is common in 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 hemorrhagic septicemia 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.
The digestion is upset and this may produce a diarrhea. Frequently blood is passed in connection with the diarrhea. The sick animal may die quickly or linger along for some time, possibly getting well.

Treatment is largely a preventive problem. If the resistance can be kept up by proper feeding, housing, care and management, there will be little cause for hemorrhagic septicemia. A cow or calf affected with this 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. All the well cattle should be vaccinated with hemorrhagic septicemia aggressin. The services of a veterinarian are advised in the treatment of the sick cattle.

**Infectious Abortion.**—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 the milk.

Most abortions occur in the 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 abortion. Some of the cows will be hard to get with calf 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 if it is possible to do so. 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.

**Infectious Ophthalmia (Pink Eye).**—A distinctly 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 winter months, but may persist during summer months for several years. This disease is characterized by a discharge from the eyes and a swelling of the eyelids. In many cases the animals temporarily go blind, a fever develops and 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 avoiding introducing sick animals into the herd. The sick animal should be put in a dark, cool stable, with plenty of fresh water supplied and only a light diet provided. The eyes may be washed with a weak solution of boric acid.
Tuberculosis.—A contagious disease caused by a germ and affecting cattle, hogs, poultry and people. In South Dakota about one to two per cent of the cattle are infected. This disease is spread from cattle to hogs and human beings. People, especially children, contract this disease by drinking raw milk from tuberculous cows.

The germ that causes tuberculosis in cattle is resistant to weather conditions, but readily killed by sunlight and disinfectants. The germs are thrown off from diseased cattle through the dung, urine and milk. Hogs contract the disease by following the diseased cattle in the feed lot and by drinking skimmed milk from the infected cows.

The symptoms of tuberculosis are very hard to describe, in fact, there are no symptoms in the early stages of the disease. The disease may get a good start and many animals in the herd may get infected before any symptoms are noticed. The best way to diagnose tuberculosis in the living animal is by the use of the tuberculin test.

There should be no question about the advisability of having the herd tested. The test is required for show and shipment purposes. Most cities require it for the sale of milk. Those not in an accredited county or who cannot get an accredited herd test may have their cattle tested by the local veterinarian.

Parasitic Diseases

Flies.—Many different species of flies infest cattle. Some are blood-suckers 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 their bites.

As soon as the fly season starts during the summer the beef calves should be kept in the barn in a dark place 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 very cheap fly repellent may be made by using ten gallons of crank-case oil (refuse from tractor or automobile) and one pint of oil of tar. In case a smaller quantity is desired the proportions may be cut down, such as one gallon of crankcase oil and one and one-sixth ounces of oil of tar. This repellent should be applied with the ordinary cow sprayer.

Lice.—These parasites obtain their food 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.

A dusting powder consisting of equal parts of flowers of sulphur and ground sabadilla seed may be used during the winter months, when it is not advisable to use a liquid. However, this treatment is not as effective as spraying the animal with a solution of coal tar dip. Any of the common coal tar dips, such as kreso dip made into a 3 per cent solution will kill cattle lice. The spraying should take place at intervals of ten days until the lice are all destroyed. The common bucket spray pump may be used for this purpose. Send for Farmers’ Bulletin 909, U. S. Department of Agriculture.

Ring Worm.—An affection 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 become bare of hair and is attended with more or less
itching. It is communicable to man. To control ring worm 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 the early spring and destroyed. An ointment made of one part of iodoform and five parts vaseline will destroy grubs if a small portion is rubbed into the holes of the skin where the grubs have developed.

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 swelling above the hoof, foul odor, and pus accumulation beneath the horn.

Keep the feet clean and provide exercise. Soak the feet in a 2 per cent solution of coal tar disinfectant.

Bloat.—An excessive amount of gas in the paunch brought about by some digestive disorder. The immediate cause is often the eating of 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 usually 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. The placing of 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 that 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, it should be done.

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, glycerin or glacial acetic acid is applied to their surfaces daily. Another remedy is seven parts of collodion and one part of salicylic acid.

Fitting and Showing

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

In preparing baby beefes for the show ring many different things may be done to improve their general appearance. However, such things should be within the permissible practices and such a thing as "plugging" an animal should not be resorted to. The animal should be groomed frequently; this need not necessarily be done with a curry-comb but with a brush, the idea being to clean the animal and to soften up the hide. If a curry-comb is used it is liable to cut the hair and pull some of it out. A good bath once every two weeks is beneficial. Use plenty of water with tar soap. Rub the hair with the hand or brush so as to loosen all the dirt particles. After
the water and soap are removed a solution of dip may be applied. Aberdeen Angus cattle are not usually washed but Shorthorns and Herefords are. Some animals should be shown with hair curled while others will present the best appearance if shown smooth.

Feeding for Shows.—Cattle being prepared for show must be handled and fed somewhat differently than those being fed for ordinary market. The cost of feed is not given as much consideration when cattle are being prepared for show as in connection with market animals. Skillful feeding is necessary in preparing an animal for show. It is sometimes 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 is much safer and 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 calves after they have become ten 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 and, therefore, the animal should not be fed too heavily on these two roughages. The grain rations for show animals will have to be increased and the roughages cut down. In some cases it is necessary to add an appetizer in the form of molasses to the feed of show animals. The rations previously suggested may be used with the exception that larger amounts of grains or concentrates could be used and the animal should be fed three times daily.

Care of the Feet.—Do not neglect the feet of the animal to be shown. Feeding and washing the feet is important in preparing for shows. While the animals should be washed carefully, they should not be washed too often. It is usually best to wash the feet of the animal just before entering the show ring. Excessive washing of the feet leads to the loss of the natural dirt which protects the feet from injury. Wax may be applied to the hoofs to help prevent injury.
shown; unless the feet are properly trimmed it may be difficult for it to stand squarely. When trimming the feet tie the animal in a stall or alongside a board fence as illustrated. 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.

Fig. 20.—Shaping, Trimming and Polishing the Horns.

(A). Horn weights are used to improve the symmetry and curvature of the horns. (B). The rasp is used for the greater part of the trimming after the scaly portions have been removed with a knife. (C). Sandpapering the horn to secure greater smoothness. (D). The right horn is properly trimmed and polished, the left horn is still in the rough.

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 towards 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.

**Care of the 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 they 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 in order to secure symmetry and proper curvature to the horns. Do not use the weights while the horns are young and soft. Start with a light weight, one weighing a half pound, and if the horns yield too rapidly remove the weights for a period of two or three weeks, and then apply them 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 determined. Where necessary to weight or train the horns, the club member should consult some stockman who has had experience in doing this, as it requires study, experience and skill to secure the desired results.

Horns of medium size, properly shaped and neatly polished are attractive and an indication of quality in the animal. In polishing 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 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 ten 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 on the nose. The polled Hereford head is sometimes clipped too, but the heads of the horned cattle are not clipped. The tails of all beef breeds excepting Galloway are clipped. Care should be taken to leave a good switch. Starting a little above the switch or 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.

Fig. 22.—The Aberdeen Angus is Generally Shown With the Hair Smooth.  
(Courtesy U. S. Dept. of Agriculture.)

For two weeks prior to showing be sure to brush the animal thoroughly each day. The final brushing 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 tip of the hair. Short haired animals are shown with the hair smooth and if it does not have the desired glossy appearance apply a little separator oil (any mineral oil) to a woolen cloth and rub the hair down following with the hand to give it the proper gloss.

The final brushing for the long haired animals (Shorthorn, Hereford and Galloway) is made against the direction of the hair so as to make it more fluffy. Herefords are generally shown with the hair curled while Shorthorns may or may not be. Figs. 23, 24 and 25 give a clear idea as to how this curling may be done. 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 the curling can be done quickly and properly. 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 8-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 as shown in Fig. 25. A round spring curry comb is used, the outer two rows or springs 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.

Fig. 23.—Steps in Fitting the Shorthorn.
(A). The hair is parted along the back before curling. (B). Making parallel lines along the side to curl the hair. (C). Brushing up the tips of the hair to give the fluffy, wavy appearance.

Training the Animal.—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 was 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. By having the animal 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 on the alert to have his animal present the best possible appearance to the judge.

![Image of a properly fitted Shorthorn cow.](image)

**Fig. 24.—A Properly Fitted Shorthorn. Note the wavy appearance of the hair.**
(Courtesy U. S. Dept. of Agriculture.)

At the Fair and in the Show Ring.—If the animal is well finished and 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, and try to follow the same regular schedule of feeding as was practiced at home.

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; the chances are its appetite will come back strong.

When your class is called for the show ring, have your animal well fitted and be 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 an 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.

Fig. 25.—Fitting the Hereford.

(A). Clipping the hair from the tail. (B). The round spring comb is used to curl the hair. (C). Catching the tips of the hair or combing up to give the wavy appearance. (D). A well fitted Hereford.

(Courtesy U. S. Dept. of Agriculture.)

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.
Marketing

By A. M. Eberle, Extension Economist, Marketing

It is not only important to master the problems of beef cattle breeding, feeding and management, but it is equally important to make a continuous study of the livestock markets. The question of first concern to the prospective cattle feeder is the future of the fat cattle market. The 4-H club member and the cattle feeder should make a study of market trends and cycles as concerns both feeder and fat cattle, for the old saying still holds good, “that feeder cattle well bought are half sold.”

![Price Fluctuations Diagram](image)

**Price Fluctuations**

A study of price fluctuations reveals three types of movements; a tendency to change in a given direction called a trend, a more or less regular “up and down” called a cycle, and changes that take place annually called seasonal variations. The cycle movement and trend in prices can be forecast to a certain extent. Because farmers usually go into cattle when they are high in price and out of them when they are low in price, we have cycles in production. The last three cycles have been just 16 years in length, that is, it took that long to start at one low point in cattle numbers in the United States, increase to a high point and then decrease again until the next low point was reached. When we are increasing numbers and building up herds, fewer cattle go to market and the trend in prices is upward. The reverse is true when farmers start to cut down their herds.

The present cycle started in 1928 and since that time we have been increasing cattle numbers in the United States. A point will soon be reached when farmers will have all the cattle on farms they can handle and then marketings will increase. As they increase, prices will have a tendency to move downward and this will result in farmers going out of the cattle busi-
ness again. As soon as this increase is marketed, and fewer cattle are sold, prices will start to strengthen and this will encourage farmers to increase numbers again and so the cycle begins all over. The time for beginners to go into the cattle business is when everyone is going out. A knowledge of the cattle cycle and its effect upon price will give the grower an intelligent basis on which to plan his expansion or curtailment program.

Seasonal price variations are due to changes in supplies of cattle marketed from one month to the next. The season of greatest cattle slaughter is during the fall when grass cattle are most plentiful. This large supply of grass cattle is offset somewhat by the practice of cattle feeding, which brings about a more even distribution of beef supplies during the year. The heavy movement of range and grass cattle reaches its greatest volume in October and runs into December. The movement of fed cattle, although continuing throughout the year, increases during the fall, winter, and spring months, and reaches its peak usually in May. The supply, then, shifts from fed cattle the first half of the year to grass cattle during the second half. This shift in the supply causes seasonal fluctuations in prices.

Ordinarily during the late winter and spring when the largest proportion of fed cattle come to market, prices for such cattle average the lowest of the year. Choice and prime grades usually average the highest during the late summer and fall. Prices of common and other lower grades of cattle are usually highest during the spring when market supplies of such cattle are the scarcest and tend to work to lower levels as the supply of grass cattle increases, usually reaching the lowest of the year in November. The narrowest spread in prices between all grades of cattle exists in the spring of the year. Prices of the better grades decline at this time due to heavy supplies and prices of the lower grades rise due to smaller supplies. The spread becomes very wide in the late summer and fall as the prices of the better grades advance and prices of the lower grades decline.

**Market 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 prices 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.

The grading of livestock has not been as fully developed as the grading of grain. Since livestock is of an entirely different character than grain, it cannot be measured by mechanical methods as is grain. Then again, the wide range in kind, quality, and condition of livestock makes it impossible to put it in as few grades as in the case of grain.

The United States Department of Agriculture has worked out standard grades for cattle and calves. These grades are not official in that the cattle industry does not have to accept them, but it is desirable that a uniform grading system be adopted all over the country. By such a system of grading it would be 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.
Fig. 27.—Choice Grade Feeder Calf.

Fig. 28.—Good Grade Feeder Calf.

Fig. 29.—Medium Grade Feeder Calf.
Fig. 30.—Prime Grade Slaughter Steer.
(Courtesy U. S. Dept. of Agriculture.)

Fig. 31.—Good Grade Slaughter Steer.
(Courtesy U. S. Dept. of Agriculture.)

Fig. 32.—Common Grade Slaughter Steer.
(Courtesy U. S. Dept. Agriculture.)
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 and common.

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; the head is short and wide with a large muzzle. The neck is short, the crops full, the back and loin are wide and this width of topline is carried uniformly to the tail head; 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 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 of 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 feeder calves are usually of the dairy type or of scrub or non-descript breeding, being very deficient in conformation, quality and covering. They are angular and rangy with an irregular top and underline, have a plain head that is usually long and narrow, a small muzzle, a long neck, shallow body, light hind quarters, narrow chest, flat rib and a rump that is narrow and peaked. They are very thinly fleshed, the hide is usually coarse and they are lacking in quality.

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 bone 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 of good beef type breeding, they may show slight traces of the dairy type. They are blocky and compact and have a good covering of flesh. The good grade steers begin to show a slight coarseness not found in prime and choice grades.
Medium 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.

Common 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 classed 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.

Low cutters 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. On the market these animals are usually referred to as “canners.”

These grade names of slaughter steers apply also to slaughter heifers, cows and bulls, with the exception that in the case of bulls, prime and low cutter are not used.

Methods of Selling Beef Cattle

There are two general systems of livestock marketing—selling independently and cooperative marketing. The outlets available to the cattleman who sells independently are (1) local buyers, (2) shipping to central market, (3) selling direct to the country packer buyer or shipping direct to the packer, and (4) farm slaughtering and selling the meat as dressed beef.

Selling to Local Buyers.—This is one of the earliest forms of marketing cattle. Perhaps more livestock reaches the market through the country buyer than through any other one agency. This method of selling owes its popularity in part to the fact that the farmer can sell one or more of his cattle to the local buyer, receiving cash for the animals, and the buyer assumes all the risk in marketing. Local butchers buy cattle direct from farmers, slaughter them and sell the carcasses in forms of cuts of beef to their retail trade.

Shipping to Central Market.—The large scale producer who ships in carlots prefers to ship his own livestock direct to a central market. A large proportion of livestock marketed in the United States passes through these central or terminal markets and is handled by private or cooperative commission agencies. The stock is usually sold to packers, order buyers, yard traders, feeders, and other buyers. When a producer ships to a terminal market he usually consigns his stock to a commission firm that sells the stock and remits to the shipper the proceeds of the sale less any expense, including selling charges. There is nothing to prevent an owner from selling his own livestock on the terminal market, but for greatest net returns, skilled salesmanship is necessary. A commission firm may employ several salesmen allowing them to specialize in the selling of particular kinds and classes of stock. The salesman becomes a good judge of quality and the commission firm is able to render expert services to its customers.

Direct Marketing.—In some sections of the country the packer buyer calls on the producers and solicits their cattle. There are a number of pack-
ing plants in South Dakota that have their buyers out in the field. Then again, farmers truck or ship their cattle direct to a packing plant without being solicited.

**Slaughtering on Farms.**—The slaughtering of cattle on farms and selling the dressed beef to city consumers is sometimes practiced during the winter season. The consumer usually buys a quarter of beef at a time. The community meat club might be considered a method of marketing. A group of farmers (from 16 to 32 farm families) organize and slaughter a beef animal regularly each week during the summer, each member furnishing an animal at some time during the season. The carcass is divided into cuts of beef and each member receives his share, thus having fresh beef regularly during the warm weather.

**Cooperative Marketing**

Cooperative marketing of livestock has been practiced by producers for many years and has appeared in various forms, but the two most important cooperative agencies through which livestock is now bought and sold are: cooperative livestock shipping associations, and cooperative livestock commission associations.

**Cooperative Livestock Shipping Associations.**—The objects of a cooperative livestock shipping association are: (1) to market the livestock of the community in such a manner as to obtain the greatest net return to the individual members, (2) to develop better market facilities, (3) to study local, state, and national livestock marketing problems, (4) to foster and develop the cooperative spirit in the community.

A shipping association is usually organized by a group of farmers interested in marketing their livestock cooperatively. In order to protect the membership against financial losses an association should be incorporated. It is essential to have a set of by-laws as they are the working plans of the organization. Control rests in the hands of a board of directors and they in turn hire a manager to handle the business for them. He is paid on a commission basis. In order that the member be insured against loss in transit, a sinking fund is usually set up by charging a few cents per hundred weight for all stock shipped. If a loss occurs it is paid for out of this fund. All costs of the association are paid for by charging the shipper a commission, which is generally around ten cents per hundred-weight on stock shipped. The manager ships once or twice a week depending upon his volume of business.

Farmers know the shipping days and bring in their stock on those days. The manager weighs and marks each farmer's stock. The consignments are loaded together in carlots and shipped to market. The commission firm may sell animals belonging to several farmers together but the animals are weighed as marked and returns are made to each individual shipper.

Among the benefits of shipping associations can be listed, (1) the farmer receives the market price for his product with the exception of the amount deducted for the cost of shipping and marketing, (2) the farmer is protected from losses in transit, (3) it affords an opportunity for the farmer to learn about his markets, to become familiar with market demands and needs, to select markets in which to sell, to grade cattle, and to sell and receive payment on a quality basis.

Since the coming of the truck and good roads, and the development of interior packing plants, shipping associations have been decreasing in number each year. There are still a number of good associations in operation. Even though farmers have abandoned their associations and are now
marketing cattle by truck there is still a question whether this convenience is worth what it is costing and whether perhaps they would have been better off had they stayed with their shipping association.

Cooperative Livestock Commission Associations.—Cooperative livestock commission associations came into existence as a result of dissatisfaction on the part of the farmers and shippers with the services rendered by privately owned commission firms, the cost of these services, and the natural desire on the part of farmers to get into business for themselves. Some of the services and benefits of a cooperative commission firm can be listed as follows: improving market practices, lowering commission charges, in some instances reducing freight charges, reducing loss from shrinkage, keeping patrons informed concerning the market for livestock, reducing market feed costs, and creating claim, loss and traffic departments. They also maintain field men who not only solicit business but assist in organizing or strengthening local organizations.

These cooperative associations can do on the market anything that a private firm can do. The larger their volume the greater is their bargaining power when it comes to dealing with buyers. Many cooperative commission firms are a real factor in keeping up prices on terminal markets today because of the control they have over supplies. They charge the same commissions as are charged by all the firms on the market, but any profits that are made during the year are pro-rated back to the shippers according to the patronage furnished. Several cooperatives have pro-rated back as high as 40 per cent of the commissions paid by their patrons.

Selling Purebred Cattle

The producers of purebred beef cattle have a different marketing problem than those who produce feeders or fat animals for market. A purebred breeder must know all about the particular breed he is raising, must retain the proper type of breeding animals for his herd, and must select suitable animals for sale as breeding animals, while those that were culled out are usually fed out for the market. Selling a purebred animal of poor conformation or breed type is a bad advertisement for the livestock breeder and he cannot afford to take such chances.

There are several methods that breeders use in selling their purebred cattle. It is important to use an attractive roadside or highway sign as this helps the interested buyer to locate the breeder's farm and oftentimes creates an interest in the passer-by who did not know such a breeder existed in the community. It is well to show some of the best individuals in the herd at the community fair, the county fair, or the state fair, as this gives the herd added publicity and advertising and the winning of prizes and ribbons develops public confidence in the herd, as the individuals shown must have been of good breed type in order to win the prizes; naturally then buyers are attracted to the herd.

Advertising in the local or county newspaper is a good means of giving publicity to your herd and of informing the public what individual animals are offered for sale. Some breeders advertise in their national breed papers, providing the breeding and the development of the herd are such as to attract breeders from other sections of the country. Very often it is advisable and profitable to hold an auction sale of the surplus breeding stock. The smaller breeder usually attracts the farmers of his county to the sale, while the larger more experienced breeder may not only attract stockmen from within his own county but his sale will appeal to breeders in all parts of the country.
Dressed Beef

When the judge examines a fat steer in the show ring, he pictures in his mind the manner in which the animal will cut out after being killed and dressed. Likewise the buyer at the fat cattle auction or at the market pictures the fat animal in his mind in the form of wholesale and retail cuts. The dressing percentage and the relative yield of the animal in high priced and low priced cuts have a lot to do with the price offered.

The quality of the meat obtained from the dressed beef is important to the consumer, who desires a steak or roast that shows enough fat or finish to make it tender and give it flavor. In other words a well marbled piece of beef, one in which the fat is intermingled with the lean and showing a reasonable amount of lean meat in proportion to the outside covering of fat, is the most desirable beef.

![Wholesale Cuts of Beef Outlined on Live Animal](image)

1. Rump  
2. Round  
3. Hind Shank  
4. Flank  
5. Loin  
6. Ribs  
7. Plate  
8. Fore Shank  
9. Brisket  
10. Chuck  
11. Neck

The Side of Beef

What makes a good side of beef? That question ought to be in the mind of every 4-H club member who is feeding out a baby beef, when studying the good and bad points of the animal and comparing it with the beeves owned by other club members. Each side of beef, as illustrated in Fig. 34 is divided into steaks, roasts, and stew meat. The most valuable wholesale cuts are the loin, the round, the rib, and the rump. The loin and round are usually cut into steaks, and the rib and rump into roasts. The chuck is used for roasts and steaks, and flank for steak, stews or hamburger, and the plate and brisket for stews or boned and rolled for roasts. As a rule there is more demand for steaks than there is for roasts especially during warm weather, because they are more easily cooked and served. For this reason the steaks usually sell higher than the roasts. The loin steaks are more tender than the round steaks and generally sell for higher prices. The rump roast and the rib roast are considered more desirable than the chuck roast which is a little coarser in texture. It is important then for the baby beef to be well filled or thickly fleshed in the regions of those valuable cuts. The more weight the animal carries in the loin, the
Fig. 34.—Side of Beef Outlining Wholesale Cuts.

1. Round  
2. Rump  
3, 4, 5. Loin  
6. Flank  
7. Hind shank  
10. Prime Rib  
11, 12, 13. Chuck  
14. Neck  
15. Fore shank  
16. Brisket  
17. Plate  

(Courtesy Iowa Beef Producers Association.)

round and the rib, as compared with the weight in the shoulder, plate, and brisket the more valuable will it be from the butcher's standpoint.

Making the Wholesale Cuts

In cutting up a side of beef, the cuts are made to separate the higher priced, or better, quality cuts, from the cheaper, or lower quality cuts. In quartering the side of beef, the cut is made between the 12th and 13th ribs, thus leaving one rib on the hind quarter. This too leaves approximately 49 per cent of the weight in the hind quarter, and 51 per cent of the weight in the fore quarter. Very often the cut is made between the 11th and 12th ribs, as this divides the two quarters quite equally. Insert
the knife between the two last ribs, cutting between them toward the backbone; reverse the knife and cut toward the flank edge, but leave about 4 inches of the flank edge uncut so as to hold up the fore quarter after sawing through the backbone.

Fore Quarter.—In cutting up the fore quarter, the object is to separate the higher quality pieces or roasts (Numbers 10, 11, 12, and 13) from the lower quality or stew pieces (14, 15, 16, and 17). Place the quarter on the table with the bone side down. At the rib edge determine the point where the lean is the thinnest, which will be about 12 or 13 inches from the middle of the backbone in the average quarter. Cut forward to between the 5th and 6th ribs. This will separate the plate from the rib. Make a cut between the 5th and 6th ribs so as to separate the prime ribs from the chuck and the plate from the brisket. In separating the brisket from the chuck, make the cut across the fore arm so that it will come out at the angle formed by the fore shank and brisket. Saw across the arm bone and separate the fore shank from the brisket by cutting along the connective tissue between the brisket and the under side of the shank. After removing the shank, continue this same cut so as to separate the brisket from the chuck.

Hind Quarter.—In cutting up the hind quarter, place it on the table with the bone side up. First remove the kidney fat or suet leaving a covering of the fat over the tenderloin muscle. Remove the flank (6), making the cut so as to leave about 4 inches of the last rib in the flank piece. In opening the hind quarter, start at the point of the backbone where it begins to make the raise toward the tail head and count off 4 vertebrae toward the tail head. This will determine the point at which to make the cut so as to separate the loin (3, 4, and 5) from the round and rump (1 and 2). In making the cut at this point of the vertebrae, and just in front of the pelvic bone it will naturally strike the ball and socket joint; the cut should
be made parallel to the forward edge of the loin. In separating the rump (2) from the round (1), the cut is made directly back of the pelvic bone. It is easier to handle the round by leaving the hind shank attached to it until most of the round has been used, then the shank may be removed by making the cut at the joint.

**BEEF CUTS AND THEIR USES**

Beef is light cherry red in color and the lean should be well marbled with fat. Flinty white bones are an indication of an aged animal; the bones should be porous and pinkish.

<table>
<thead>
<tr>
<th>THE CUT</th>
<th>ITS CHARACTERISTICS</th>
<th>ITS USES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FOREQUARTER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Rib</td>
<td>Choice part; lean is tender and well flavored. Contains 7 ribs</td>
<td>Roasts, sometimes steaks</td>
</tr>
<tr>
<td>2. Plate</td>
<td>Lean and fat in layers with rib ends</td>
<td>Stews and pot roasts or boned and rolled for roasts. Cured for corned beef</td>
</tr>
<tr>
<td>3. Brisket</td>
<td>Layers of juicy well flavored meat over fat and bone</td>
<td>Same as plate cut</td>
</tr>
<tr>
<td>4. Shank</td>
<td>Bone and gristle with varying amounts of lean</td>
<td>Small pot roast from upper part; remainder, stews soup or hamburger</td>
</tr>
<tr>
<td>5. Chuck</td>
<td>Good quality, well flavored, muscles do not run in one direction</td>
<td>Steaks, roasts, pot roasts, stews, boiling meat or portions can be corned</td>
</tr>
<tr>
<td>6. Neck</td>
<td>Bony but juicy and well flavored</td>
<td>Soups, stews or mincemeat</td>
</tr>
<tr>
<td><strong>HINDQUARTER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Flank</td>
<td>Practically boneless, lean coarse grained but fine flavored, more or less fat tissue</td>
<td>Flank steak, pot pie, stews or cured as bologna roll</td>
</tr>
<tr>
<td>2. Loin</td>
<td>Tender, juicy sirloin and porterhouse steaks</td>
<td>Steaks or roasts</td>
</tr>
<tr>
<td>3. Rump</td>
<td>Large amount of bone but solid lean is juicy and well flavored</td>
<td>Steaks, pot roasts or cured as corn beef</td>
</tr>
<tr>
<td>4. Round</td>
<td>Tender, well flavored and very little waste</td>
<td>Steaks, swiss steaks, roasts or cured as dried beef.</td>
</tr>
<tr>
<td>5. Shank</td>
<td>Bone and gristle with varying amounts of lean</td>
<td>Stews, soups or hamburger</td>
</tr>
<tr>
<td><strong>OTHER EDIBLE PORTIONS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The heart may be roasted, stewed or braised; the liver fried, baked or used in meat pie; the kidneys broiled, stewed or fried; the tongue corned, smoked pickled or cooked; the tail used for soup or braised; the tripe pickled, creamed or breaded; and the surplus tallow and fat used in making soap.</td>
<td></td>
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</tbody>
</table>

**Judging Beef**

When judging beef either as the side of the beef or as a wholesale cut, consideration is given to its conformation or form, its finish and its quality. The condensed score card here shown is suggested as an aid to the beginner in arriving at a balance of judgment in considering the value of two or more cuts of beef.

| Per cent |
|-------------------|-------------------|-------------------|-------------------|
| 1. Conformation   | 25                | 25                | 50                |
| 2. Finish          |                   |                   |                   |
| 3. Quality         |                   |                   |                   |
| **Total**          | **100**           |                   |                   |
1. Conformation.—This covers the shape, form and general outline of the side of beef or the wholesale cut, and depends upon (1) the bony framework or skeleton, (2) the depth of flesh, and (3) the amount and distribution of fat. The first two are controlled to a large extent by a careful selection of the proper kind of feeder animal while the third is added by good feeding. In considering conformation or form the side or cut of beef should be attractive, plump and smooth and not angular.

Best conformation includes: Short shanks and neck, deep full rounds, thick loin, good balance, well covered ribs, and a deep ribbed middle making a straight line from round to shoulder. Poor conformation involves: Angularity in general appearance, prominent hip and shoulder bones, long slender rounds, a long neck, a shallow loin, a slack rib, and a lack of symmetry.

2. Finish.—By the term finish is meant the amount and distribution of the fat. The eveness of fat distribution is largely a matter of breeding but the amount of fat is influenced by feed and care. Finish is an index to quality, it makes a carcass more attractive and is essential in making the meat palatable. In referring to the finish of a side or cut of beef consider the covering of fat, which should be abundant, yet uniform and smooth, so there will be no "gobby" or "wasty" appearance.

Best finish includes: A smooth and even covering of white flaky fat over the exterior of the carcass averaging about three-fourths of an inch thick over loin and ribs. As the rounds, neck and belly are the last section of the live animal to be covered with fat, the greater the degree of fat in these parts on the carcass the higher the finish. The covering of fat should be smooth and not wasty about the kidney. Poor finish implies: A lack of external and internal fat, and uneven distribution of fat.

3. Quality.—The character and color of the flesh and fat included in the side or cut of beef are what constitute quality. It includes juiciness and marbling, for beef that is dry and not tender lacks quality. Quality is usually an index to good breeding and good fleshing but age and sex are also important. Fineness of bone and hair, a thin pliable hide, and early maturity indicate quality in the live animal. The illustrations on page 46 show good and poor quality in beef. Beef of high quality, then, is well marbled, the lean is firm and not watery, and should be fine grained in texture and a bright cherry red in color, while the fat should be flaky and of a white to creamy white color.

Best quality includes: Delicate muscle fibred meat containing juices but remaining firm to touch. There must be a distribution of fat between the muscle fibres giving the cut surface a streaked or "marbled" appearance. The fat and meat juices give the meat its flavor. The cut surface shows fine grain, is smooth and velvety to sight and touch, and is light or bright cherry red in color. The cut surface of high quality meat will also reflect light. Poor quality meat is less tender due to muscle fibres lacking "marbling." It is dark red in color due to the age of the animal, its sex, the way it was fed, or to its management just before slaughter. Poor meat lacks flavor and is dull in color when cut.
Information for Beef Club Members

Beef Cattle Registry Associations and Secretaries:
- American Hereford Cattle Breeders Association—R. J. Kinzer, Kansas City, Mo.
- American Polled Hereford Breeders Association—B. O. Gammon, Des Moines, Iowa.
- Red Polled Cattle Club of America—Harley A. Martin, Richland Center, Wis.
- American Shorthorn Breeders Association—P. K. Groves, U. S. Yards, Chicago Ill.

South Dakota Experiment Station Bulletins:
(They may be obtained free by writing the South Dakota Experiment Station, Brookings, S. D.)
- No. 174. Sorghums for Forage in South Dakota.
- 229. Stacked Green Corn for Cattle.
- 255. Cattle Ranch Organization in South Dakota.
- 256. The Value of Grinding Grain and Roughages for Livestock.
- 262. Barley as a Fattener for Cattle and Swine.
- 271. Rye as a Fattener for Cattle and Swine.

Circular No. 3. Feeding Flax Straw to Cattle.

South Dakota Extension Service Circulars:
(They may be obtained free by writing the Extension Service of South Dakota State College, Brookings, S. Dak.)
- No. 31. Farm Building Ventilation.
- 32. A Serviceable Farm Barn.
- 259. Alfalfa for Livestock.
- 264. Pit and Trench Silo.

United States Department of Agriculture—Farmers Bulletins:
(They may be obtained by writing the Division of Publications, U. S. Department of Agriculture, Washington, D. C.)
- 1068. Saving Farm Labor by Harvesting Crops with Livestock.
- 578. The Making and Feeding of Silage.
- 724. Feeding Grain Sorghums to Livestock.
- 1179. Feeding Cottonseed Products to Livestock.
- 1069. Tuberculosis in Livestock.
- 1586. Infectious Abortion in Cattle.
- 612. Breeds of Beef Cattle.
- 1073. Growing Beef on the Farm.
- 1395. Beef Cattle Production in the Range Area.
- 1584. Feed lot and Ranch Equipment for Beef Cattle.
- 1115. The Beef Calf.
- 1549. Feeding Cattle for Beef.
- 1415. Beef on the Farm, Slaughtering, Cutting, Curing.
- 1600. Dehorning, Castrating, Branding and Marking Beef Cattle.
- 848. Yearbook, separate. “From Scrubs to Quality Stock.”

The 4-H Club member who is interested in securing books on beef cattle may obtain a suggested list of such books free of charge by writing the Extension Service, South Dakota State College, Brookings, S. Dak.
Fig. 36.—On to Market—But the 4-H Club Member Carries on.