1930


M. L. Flack

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DAIRY CALF CLUB MANUAL
Nebraska 4-H Clubs

Those working with 4-H clubs have had three main objectives in mind—"The development of boys and girls," "giving to each club member information which will be of value," and "the completion of a definite piece of agricultural or home economics work."

Through club organization, boys and girls are brought into contact with each other, with an adult leader, with the community, and with other club members of the county, state, and nation. These directed associations tend to curb undesirable and develop desirable tendencies. 4-H clubs are national in their scope, and are sponsored by the United States Department of Agriculture and every agricultural college in the United States.

Every 4-H club organized in Nebraska has a common problem on which each club member works—it may be the growing of a crop, development of animals, applying the best known principles of clothing or foods. These are but a few of the numerous clubs sponsored by the Nebraska Agricultural Extension Service. The best up-to-minute information on each club is given by the Extension Service, through its connection with the Nebraska Experiment Station and the United States Department of Agriculture. The latest dependable results are always placed in the 4-H club literature.

This 4-H Dairy Calf Club Manual, together with other material, is placed with each club member and leader so that the clubs may have authoritative information on the selection, feeding, and management of a dairy calf. At the end of the period the individuals should have a complete financial and labor record on which to base further activities.

So far, the standard club has been the best method to carry on all 4-H clubs. The clubs completing work as outlined by points one to ten, given below, are known as Achievement Clubs, and are issued a gold seal for each year's activity. These seals are placed on charters issued by the United States Department of Agriculture when the club is organized with points one to four completed.

1. Five or more members working on one club project. Active members are 10 to 20 years old inclusive. Those above or below are called associate members.
2. A local leader in charge who is general adviser.
3. A club organization with their own officers having charge of business meetings.
4. A program of work for the year. Success of club depends largely on well planned program.
5. At least six meetings during the year. These are to include organization, and goals, 6, 7, 8, and 9.
6. A judging contest during the year.
7. A demonstration team giving at least one public demonstration locally.
8. An exhibit of club work.
10. At least 60 per cent of the members filing final reports.

Ask your County Agent for further information and supplies for organizing any 4-H club. If your county does not have an Extension Agent, write to the Agricultural College Extension Service, Lincoln, Nebraska.

Dairy Calf Club Manual

M. L. FLACK

This manual takes up the breeds of dairy cattle, selection of a dairy heifer for the three-year Nebraska 4-H Club project, care and management of the calf, heifer, and producing cow, the keeping of records, the fitting and showing of dairy animals, and the usual show ring qualifications. It is intended as a guide for 4-H dairy calf club members throughout the three years of their project.

Breeds of Dairy Cattle

There are five major breeds of dairy cattle in the United States, namely, Holstein-Friesian, Ayrshire, Jersey, Guernsey and Brown Swiss. Other breeds such as Milking Shorthorns and Dutch Belted are not so widely distributed.

Holstein-Friesian.—This is one of the largest of the dairy breeds, cows weighing on the average of 1350 pounds and bulls 2000 pounds. This breed is universally black and white; however, in Holland red and white Holsteins are plentiful. In the United States only the black and white animals may be registered. As a breed the Holsteins are the heaviest milk producers.

Ayrshire.—This breed originated in County Ayr, Scotland. It is a medium sized breed, cows weighing on the average 1100 pounds and bulls about 1600 pounds. Color of the Ayrshire may vary from red to a very dark mahogany brown and white, with either of the colors predominating. Ayrshires are considered good rustlers. They are also noted for uniform, square, level udders with well placed teats. Their milk is of about the average richness of the dairy breeds.
Guernseys.—This breed finds its origin on the Isle of Guernsey, an island four miles wide and seven miles long lying in the English Channel between the coasts of England and France. The characteristic color is a shade of fawn and white, varying from almost red to a very light fawn. Light fawn with white markings is perhaps the most common. A buff nose and amber color horns of medium size are other characteristics of the breed. A rich yellow secretion of the skin is most highly thought of by breeders and is considered an indication of the quality of the milk which is highly colored and rich in fat. Cows weigh on the average 1100 pounds and bulls 1600 pounds.

Brown Swiss.—While maintained primarily for dairy purposes, the Swiss cattle are claimed to be a dual purpose type. The original home of the Brown Swiss cattle was the canton of Schwyz in Switzerland,
Fig. 5.—Good type Brown Swiss cow

but the type is now bred in all the neighboring cantons of the Alpine region. The Brown Swiss were first introduced into America by Henry M. Clark of Belmont, Massachusetts, in 1869. These cattle have a rugged constitution, are very docile and respond well to good feeding. The cows weigh between 1200 and 1300 pounds and the bulls between 1700 and 1900 pounds. The cows of this breed produce a liberal amount of milk with an average test of 4 per cent.

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<tr>
<td>Holstein-Friesian</td>
<td>Holland</td>
<td>Black and white</td>
<td>1350</td>
<td>2000</td>
<td>90</td>
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<tr>
<td>Ayrshire</td>
<td>Scotland</td>
<td>Red and white</td>
<td>1100</td>
<td>1600</td>
<td>70</td>
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<td>Guernsey</td>
<td>Isle of Guernsey</td>
<td>Light to dark fawn with white markings</td>
<td>1100</td>
<td>1600</td>
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<tr>
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<td>Isle of Jersey</td>
<td>Light to dark fawn with white markings</td>
<td>950</td>
<td>1450</td>
<td>50</td>
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<tr>
<td>Brown Swiss</td>
<td>Switzerland</td>
<td>Brown gray mouse color</td>
<td>1300</td>
<td>1900</td>
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Fig. 6.—Nebraska Holstein group, National Dairy Show, 1930

Choosing a Breed

Before choosing a breed of dairy cattle, there are several things to consider.

First.—If one breed prevails and seems to be the most popular in the community, it would be best to choose this particular breed because it is much easier to buy and exchange sires and to sell surplus stock.

Second.—Personal preference is important because one is more likely to succeed if the undertaking is one of his own choosing.

Third.—The market for dairy products must be considered in choosing a dairy breed. Some cities and dairy manufacturing plants have certain requirements for butterfat and total solids in milk.

Fourth.—With the wide range of climatic conditions in the United States and the difference in topography of the land, it is always desirable that the nature of the country and climate be considered in choosing a breed.

Fig. 7.—Nebraska Ayrshire group, National Dairy Show, 1930
Selecting the Calf

It is not always possible to select a young calf that will develop into a cow of good type and profitable production. Even under the most favorable conditions and the most exacting care, mistakes in selecting often occur. In selecting a calf the following points should be considered.

**Type.**—The calf should have all the desirable characteristics of the breed it represents, such as head, color, general conformation, a straight topline with a long, wide, level rump, wide at pin bones, tail head carried out straight and smooth.

**Capacity.**—The dairy calf, in order to be a good feeder and develop into a cow of good proportions, should show plenty of barrel capacity (that is, a wide spring of rib), a deep body, good width between the ribs, and length of body in proportion to the rest of the animal.

**Constitution.**—A strong constitution is found more often in animals that have large, roomy middles. The heart girth should be large, as indicated by depth and width back of shoulders and width between front legs, thus giving plenty of room for the lungs and heart. Vigor and constitution are also indicated by strength of jaw and size and alertness of the eye.

**Dairy Character.**—It often happens that a dairy calf or cow will have constitution and capacity along with a straight top line and level rump, yet she will not have that important characteristic which distinguishes her from other breeds of cattle, which is "dairy character". Through many years of careful selection, breeders have developed the dairy cow to a point where she differs from beef breeds in conformation. The dairy cow is spare of form, free from fleshiness over the hips, pin bones and loin, thin and rather sharp over the shoulders, slender and slightly ewe necked with length of neck in proportion to the rest of the body. These characteristics should be rather pronounced even in a young dairy animal.

**Mammary Development.**—The development of the udder should be quite prominent, even in young heifers. The teats should be well apart and evenly placed. The rear attachment of the udder should be high and wide. The milk wells and veins should also show good development.

“Like tends to beget like”, so it is always a wise plan, whenever possible, to see the sire and dam. In case of a purebred the pedigrees should be studied carefully. The dam should be a cow backed by production records of at least 300 pounds of butterfat produced in one lactation period. Avoid cows of exceedingly low percent fat tests and also cows with small milk flow. The average test and milk flow of the breed which is being selected should be kept in mind.

**Judging Dairy Cattle**

Boys and girls, as young stock raisers, can well afford to take advantage of judging practice. This work, if done in a systematic way, will do more toward developing intelligent thinking and ability to make decisions, than most any other type of agricultural work. It usually takes much patience and constant practice before one can become a good judge of dairy cattle. Before starting on this type of work the beginner should first become well acquainted with all parts of the animal as well as all terms and phrases used in comparing them one with another.
The best way to get the desired information is by the use of the score card and charts furnished by the Agricultural Extension Service, University of Nebraska. The following chart gives the points of a dairy cow along with their location. On the opposite page the reader will notice a score card for the beginner.

![Diagram of a dairy animal](Fig. 11.—Parts of a dairy animal)

1. Poll
2. Forehead
3. Face
4. Nose
5. Jaw
6. Neck
7. Crest of neck
8. Throat
9. Dewlap
10. Bruket
11. Withers
12. Shoulder
13. Heartgirth
14. Back
15. Ribs
16. Loin
17. Hip bone
18. Thurls
19. Tail setting
20. Pin-bones
21. Escutcheon
22. Thigh
23. Rear attachment of udder
24. Rear udder
25. Fore udder
26. Width between teats
27. Milk veins
28. Milk wells
29. Barrel
30. Flank
31. Teats
32. Elbow
33. Forearm
34. Knee
35. Shank
36. Ankle
37. Hoof
38. Fetlock
39. Hock
40. Stifle

**Dairy Cattle Score Card**

**INSTRUCTIONS:** First make your comparison of each animal as indicated by details in I, II, III, IV, V. Then place them as a whole, all things considered.

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<tr>
<th>JUDGE'S AND CONTESTANT'S PLACING</th>
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<th>3rd</th>
<th>4th</th>
<th>5th</th>
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<tr>
<td><strong>DETAIL COMPARISONS</strong></td>
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<td>I. Constitution: Indicated by deep wide chest; large heart girth; width between forelegs; nostrils large and open; eye prominent, large and bright.</td>
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<td>II. Feed Capacity: Indicated by a long, deep, wide middle; great spring of rear rib; wide loin; length partly determined by width between ribs. Feed capacity also indicated by large broad muzzle and deep jaw.</td>
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<td>III. Dairy Character: Indicated by a clean cut open conformation and angular form. Lack of flesh over shoulders, loins, rump and thighs. Slim ewe neck; quality of skin being thin and pliable. (Dry cows and heifers near freshening are expected to carry more flesh than those in milk so should not be criticized too strongly on dairy character.)</td>
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<td>IV. Mammary or Milk System: Indicated by a large udder, attached high and wide, behind, extending down to fair depth, and carried well forward. Udder of fine quality and texture free from fineness. The udder should be of good form, evenly balanced, level on the floor, and tests of a uniform size and squarely placed. Mammary or milk veins, long, large and tortuous (crooked). Large milk wells. (Bulls: Consider masculine character as shown by boldness of head, prominent erect on neck, strong constitution, well developed rudimentaries (or teats) that are squarely placed.)</td>
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<td>V. Breed Type: Indicated by a clean cut feminine head (masculine in bulls). A straight top line; a strong loin, a long wide level rump, wide at the pin bones. Pleasing style of animal as shown by alertness and a symmetrical or well proportioned body. Scale or size that should be up to average or larger for the breed. The breed differences as to form of head and color should be considered.</td>
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<tr>
<td><strong>FINAL PLACING:</strong> Considering animals as a whole with due regard to relative merits, defects and soundness.</td>
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**Pedigrees**

A pedigree is a diagram of the ancestry of an animal by generations, and should contain records of production and show ring winnings. The male line always appears at the top of the bracket, the female line at the bottom of the bracket.

In studying a pedigree, the immediate ancestors appearing in the second and third generations should be given the most consideration. Too often animals are bought because there is a famous animal or a high record somewhere back in the pedigree, possibly as far back as the fourth and fifth generations.

It is essential to have the production records appear in the second and third generations.
Care of the Calf

Colostrum Milk.—After birth the calf should be left with the cow for forty-eight hours. This will enable the calf to get the first or colostrum milk which is laxative and so necessary to clean out the digestive tract and to build up the calf’s strength.

Teaching the Calf to Drink.—Often it is difficult to teach calves to drink unless they are hungry. For this reason it is always best to allow the calf to go without feeding for at least twelve hours after separating it from the cow. The usual method employed in teaching a calf to drink is to back the calf into a corner and stand straddle of its neck, the feeder facing the same way as the calf. The feeder then wets his two fore fingers and places them in the calf’s mouth. While the calf sucks the fingers of one hand, he takes his free hand and pushes the calf’s nose down to the milk. In many cases it takes considerable patience to get the calf started. When the calf starts to suck and thus draw milk, the fingers should be slowly withdrawn from the mouth. In case the calf takes its head out of the pail after the fingers are withdrawn, the operation should be repeated. Never attempt to force the calf to drink by holding its nose deep in the milk for a long time. If this is done, the calf cannot breathe. When attempting to breathe it takes the milk into the lungs, often causing death or injury.

Dehorning. — Many breeders prefer polled cattle and in order to have them polled, dehorn the calves when they are very young. The easiest and most humane way is to apply caustic potash or some commercial preparation to the horn when the calf is a few days old. First remove the hair over the horn, which is at this time only a small lump or button under the skin. Moisten the caustic stick and rub on the button or apply the commercial preparation. One application is all that is necessary; however, a second treatment may be required if the first operation has not been carefully done. Much care must be used in applying caustic potash since it has a very irritating effect on the skin. The operator must be very careful not to get any on his hands or on the other parts of the calfs head or face. It burns very severely and
will often leave a bad scar. It is best to have a helper while dehorning calves by the above method.

Cleanliness.—Success in dairying depends in a large measure on cleanliness. This is not only true in raising the calf but is equally true in handling the mature herd. It is much easier to prevent disease than it is to cure it. Livestock sanitation, after all, is quite simple and for a large part is quite easy, inasmuch as most of the factors which cause the animal to thrive well and be productive are also the ones which tend to preserve its health. As far as the calf is concerned, cleanliness can be discussed under three heads: 1. Pen, 2. Utensils, 3. Feed.

Pen.—The pen should be clean, well lighted and have good ventilation. Drafts and cold, damp quarters should be avoided. Conditions of this kind cause colds and pneumonia. The bedding should be changed often enough to insure a clean, dry pen at all times. It is a good practice to disinfect the stall before putting the calf in it.

Utensils.—Feeding utensils such as buckets, feed boxes, and mangers should be free from dirt and filth. Filthy utensils are a frequent cause of indigestion and scours. Feeding pails should be washed and scalded after each feeding. Mangers or other parts of the stall that become dirty as a result of spoiled feed, should likewise be cleaned frequently. A few minutes each day spent in cleaning up the calf quarters and feeding utensils will be time well spent because many losses can be attributed to filthy utensils.

Feeds.—Milk that is sour or grain and hay that are moldy and unfit for young calves should be avoided. They, like filth, cause digestive troubles and losses to the dairymen. Only milk and feed that are known to be clean should be fed.

How Much to Feed.—It is best to feed young calves three times a day as more milk can be fed with much less chance of injury than where the calf is fed twice daily. Whether the calf is fed twice or three times daily, the following details should be observed. It is best to feed the mother's warm milk to the calf for a day or two. The temperature of the milk is important and it should be kept near the temperature of the animal's body. Avoid milk that is too hot or milk that is too cold. Milk of this kind is likely to cause digestive disorders. From two to three pounds of milk at a feeding, depending on size and strength of the calf, will be ample for the first few days. The amount fed is usually determined by the weight, breed and physical condition of the calf. A general rule that is sometimes followed is to feed Jerseys and Guernseys one pound of milk per day for each ten pounds of live weight at the start. Larger breeds such as Holsteins and Brown Swiss need about one pound of milk for each eight pounds of live weight. The following calf-feeding schedule is a good one to use the first six months.
Feed Regularly and Not too Much.—The best dairymen and stock-
men are regular in their feeding work. Effects of irregularity in feed-
ing are very evident in many poorly managed dairy herds. Decrease
in production, as well as thin, rough looking animals, can be attributed
partly to irregular feeding. A large percentage of our death loss in
calves can be traced to overfeeding. This is because the young calf
in many cases cannot digest all the feed it consumes. Its digestive
tract becomes irritated and infected. Then we have a sick and often
stunted calf. Some precautions are necessary in raising calves: first,
do not overfeed; second, feed regularly; third, weigh or measure feed;
fourth, make changes gradually; and fifth, keep all feeding utensils
clean.

From Whole to Skim Milk.—Calf raising is made easy when there is
plenty of skim milk available. It is a very satisfactory substitute for
whole milk. It is whole milk with the butterfat removed. The change
from whole to skim milk should be very gradual. One pound of skim
milk should replace one pound of the whole milk daily. In other
words, remove one pound of the whole milk and add one pound of
the skim milk daily until all the whole milk has been taken away.
In making the change, be sure the skim milk is warm, or near body
temperature. The froth on separated milk should be removed as it
often causes bloat.

Skim milk is a very valuable feed for a calf and can be used to
good advantage until the calf is six months old. In case skim milk
is not available, some of the commercial calf meals can be used.
Directions should be followed very closely in using them. It is well
to keep in mind that there is really no substitute for milk. Skim
milk and a home mixed grain ration will usually give more satisfactory
results at less cost than will calf meal.

Grain Mixtures.—A grain mixture is cheaper than whole milk, and
should be used to supplement the skim milk and take the place of the
fat taken out of the milk. Calves should be taught to eat grain early
in life. A small amount put in a box in their stall or in a bucket
where they can have access to it often gets them started to eat small
quantities of grain at two to three weeks of age. A little of the grain
mixture placed in the calf’s mouth will give him the taste for the
grain and get him started to eat earlier.

A good grain ration for calves and one often used, is equal parts
by weight of ground corn, ground oats and wheat bran. Other mix-
tures are often fed. The following is a list of the most common.

1 part cracked corn 2 parts cracked corn
1 part whole oats 1 part ground oats
1 part wheat bran 1 part linseed oil meal

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Calves under four months of age will not overeat, but older calves should be limited in amount of grain fed. The amounts fed should be governed by the condition of the heifer. She should be fed enough grain to keep her in good growing condition. Avoid getting the heifer kept for breeding purposes too fat. A rule that is sometimes followed is to feed one-fourth to one-half pound of grain per day for each hundred pounds live weight. Of course this depends on the condition of the heifer.

**Roughage.**—The calf will begin to eat hay at about two or three weeks of age. Mixed hay is preferable to alfalfa for the first six or eight weeks. Prairie, timothy, blue grass and other hays that are of a fine texture and good quality are best. Alfalfa is frequently used but sometimes with the real young calf it causes scouring. For the older heifer, alfalfa can be used exclusively with good results. All calf pens or stalls should be equipped with a slatted rack that prevents waste and holds a sufficient amount of hay to insure a constant supply.

**Silage.**—Silage is an excellent feed for a growing heifer over three months old. It adds bulk and succulence to the ration. Silage should be fed in small quantities to the young heifer. It is not best to substitute silage for all the hay as it will probably not supply enough food for maximum growth. Silage should be fresh from the silo, of good quality, and free from mold.

**Water and Salt.**—In addition to grain and hay, water and salt must be supplied, since both serve as a tonic as well as having food value. A growing heifer should have access to salt. Have a supply of fresh, clean water available at all times. Regardless of the amount of milk fed, the heifer should have water. In extremely cold weather, the water should be warmed, thus insuring a larger consumption, which is desirable.

**Exercise.**—The heifer should be given a lot or pasture in which to exercise both in summer and winter. Both exercise and sunlight help to insure normal growth and good health.

(For more detailed information on feeding and care of the dairy calf, see Uni. Nebr. Extension Circular 622.)

**Care of the Heifer Until Freshening**

**Winter Feeding.**—Heifers from one to two years old need about the same care as the six or eight months old heifers. Because of their greater size, however, they will consume more feed than their younger sisters. Roughage should make up the greater part of their ration. Good quality alfalfa or other legume hay is best and should be fed liberally. A good measure is to feed all they will clean up. In addition it is a good practice to feed ten to fifteen pounds of silage and one-fourth to one-half pounds of grain for each hundred pounds of live weight. The amount of grain to be fed will depend on the condition of the heifer. Any one of the three grain mixtures mentioned before in this manual will supply the dairy heifer's needs. An abundance of pure water should be available for the heifer. In cold weather and where water is supplied in an outside tank, some means of keeping it from freezing should be employed.

**Summer Feeding.**—Good green pastures furnish well balanced rations which are high in protein and minerals. Pastures simplify the care and feeding of the heifer very materially. If the pasture is good and not too heavily stocked, little or no grain will be needed. If native pastures dry up in late summer and fall, grain is needed in order to insure steady growth. The amount of grain will depend on the condition of the pasture as well as that of the heifer.

**FIG. 15.**—Fresh clean water is essential

**FIG. 16.**—Shade should be provided for growing heifers
Quarters for the Heifer.—Heifers require dry, well bedded and well
ventilated quarters, such as a pen in the barn or an open shed facing
the south. An open shed with a lot or paddock attached has the ad-
vantge of the exercise it offers. In summer a shelter should be pro-
vided in case there is not plenty of natural shade. This can be an
old building or a temporary shed. In case the heifers are to be
shown, it is well to provide a darkened shelter which will give them
protection from flies.

Breeding Age.—The age of breeding will depend upon the growth
and development of the individual. Jerseys and Guernseys mature a
little earlier than Holsteins, Ayrshires, and Brown Swiss, and as a
rule can be bred at an earlier age than the other breeds mentioned.
In general, all breeds can be bred between fifteen and eighteen months
of age. This will bring the first calving between twenty-four and
twenty-seven months. The owner should, if at all possible, arrange
to have his cows or heifers freshen in the fall.

Care and Feeding of the Young Cow

Feeding Before Freshening.—Proper feeding before freshening in-
sures the birth of a strong, vigorous calf. It also adds growth and
size to the heifer. Liberal feeding of a slightly laxative ration, rich in
protein, vitamins and minerals, should be the practice.

A satisfactory grain mixture for this period is two parts ground
corn or barley (by weight), two parts ground oats, two parts wheat
bran, and one part linseed oil meal. The grain ration should be sup-
plemented with a legume roughage of good quality.

Two or three weeks before the heifers freshens, the amount of grain
fed should be reduced to one-half or one-third the regular amount, and
't is best to omit the corn or barley entirely. Keep the heifer in a
laxative condition. Light feeds of ground oats and bran will be sat-is-
factory for this period.

Care at Calving Time.—In case the heifer freshens in the fall or
winter and not in the pasture, a roomy, well-lighted stall should be
provided. She should be removed from the herd several days before
time to freshen and placed in a box stall. This will give her time to
get well acquainted with her new quarters before the calf is born.
The stall should be thoroughly cleansed and disinfected with a coal
tar disinfectant and fresh, new bedding should be supplied.

After freshening, the heifer should be kept dry and warm and in
out of bad weather. Her vitality is lowered following calving and good
care is essential for a few days in order to get her back to normal
strength. Luke warm water should be supplied every few hours for
drinking. A good quality of legume hay and a bran mash will be the
only feed necessary for a few days.

Feeding for Milk Production.—Since it will take the heifer two or
three weeks to reach a maximum milk flow as well as to recover from
calving, it will be necessary to feed light for several days. After the
first two days she may be gradually started on the ration that she is
to receive during her lactation period. It will take from two to three
weeks to get her on full feed.

Roughages.—A combination of legume hay and silage makes a very
desirable roughage for dairy cows. In every case, legume hay should
form a part of the roughage. A good roughage is one of the most
valuable feeds for the dairy cow. In Nebraska, alfalfa hay is largely
used, because it is palatable, is high in protein, and is a good source
of minerals and vitamins. By using a good grade of legume hay,
smaller amounts of protein may be used in the grain mixture, thus
cutting down the cost of feeding.

Silage is very valuable as a roughage. In the fall and winter it
takes the place of pasture by adding succulence. It has an excellent
physical effect on the animal and stimulates the appetite when silage
and a legume hay are used as roughages. Feed approximately one
pound of hay for every hundred pounds of live weight and three
pounds of silage for the same amount of weight. Most dairymen feed
what hay a cow will clean up readily and between thirty and forty
pounds of silage daily.

Non-legume hays such as timothy, corn stalks, and red top, are poor
roughages for cows in milk. They are low in protein and minerals.
If any of these non-legume hays are fed, it will be necessary to add
more protein to the grain mixture which will increase the cost of the
grain fed.

Feeding Grain Mixture.—Home grown grain such as corn, oats, and
barley, should be used as extensively as possible in the dairy cow's
ration. In order to supply the cow with enough protein for her main-
tenance and milk flow, it will be necessary to add such feeds as lin-
seed oil meal, cotton seed meal, wheat bran or gluten feed to the
home grown grains which are low in protein.

The following grain mixtures are often used:

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<th>Mixture</th>
<th>Protein content</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9.1%</td>
</tr>
<tr>
<td>2</td>
<td>11.3%</td>
</tr>
</tbody>
</table>

The grain mixture should be fed according to production. Failure
to follow this principle in feeding dairy cows usually results in waste.
of feed and a loss of milk production. The amount of milk produced daily should be the guide. Feed one pound of one of the above mixtures for each three to four pounds of milk produced daily.

Substitutions.—Barley can be substituted in a ration for corn. Cottonseed meal or ground soy beans can be substituted for linseed oil meal. One hundred and twenty-five pounds of corn and cob is equal to one hundred pounds of ground corn.

Summer Feeding.—In the spring and early summer dairy cows usually produce well because they have access to good pasture which is one of nature's best feeds. Grass is palatable and succulent and provides protein, minerals, and vitamins. Even when pasture is abundant cows should receive some grain, especially the high producing ones. It tends to keep them from losing flesh as they otherwise would.

During the hot, dry summer and fall months, grain is very essential for the dairy cow. When pastures become burnt and dry, they furnish very little succulent feed. The summer ration need be only ground corn and ground oats, equal parts, and while the pasture is good, one pound of grain will suffice for eight or ten pounds of milk produced.

Native grasses cannot be depended upon for any length of time so the best dairymen have supplement pastures of sweet clover or sudan grass on which they can turn their cattle after the native and blue grass pastures are gone. Pasture is a cheap source of feed and should be used for as long a period as possible.

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(For more detailed information, see Uni., Nebr., Extension Circular 621 on Feeding the Dairy Cow.)

Dairy Herd Improvement

Dairy herd improvement associations, better known as cow testing associations, are organized to aid the dairymen in eliminating the unprofitable cow. There are twenty-eight full-time associations with over six hundred members in the state of Nebraska at the present time. These men are building up fine herds of dairy cattle by better breeding, feeding, and culling. In the past few years Nebraska has culled approximately three thousand cows. A dairy herd improvement association is an organization of farmers who cooperate in securing the services of a tester, who visits each farm every month and weighs and tests the milk of each cow. The tester also weighs the hay and grain and furnishes the owner of the herd a complete record of each cow's profit or loss above feed cost in the herd. The tester helps further by giving advice on economical feeding and improvement of the herd. Such organizations are of much value to the breeders and community.

Keeping Records

Every club member should keep accurate records of all the feed fed and other items of expense as well as the gain and growth of his calf. If a club member neglects to keep records, he has not only missed an opportunity to find out what it costs to raise a calf until she is a cow, but has neglected to form the habit of keeping records which is essential in later life. A special book is furnished by the club office for this purpose.

Do not feed the calf from the common herd supply. It is best to have a box or barrel in a convenient place which will hold a two weeks' supply of grain. When adding a supply of grain, weigh it and put the weights in your record book. If this amount of grain feeds the calf for fourteen days, it is very easy to find out how much she is eating each day of the month. The amount of roughage fed in a month may be estimated by multiplying the amount fed per day by the calendar days in a month. All records should be kept for each month during the entire three years, or until the project is finished.

Production Records.—One of the most interesting phases of the dairy calf club project is the keeping the milk and butterfat record. This usually comes in the third year of the project. Although the club member owns a heifer from a dam with over 300 pounds butterfat, it tends to keep them from losing flesh as they otherwise would.

Any club member who has neglected to form the habit of keeping records is an organization of farmers who cooperate in securing the services of a tester, who visits each farm every month and weighs and tests the milk of each cow. The tester also weighs the hay and grain and furnishes the owner of the herd a complete record of each cow's profit or loss above feed cost in the herd. The tester helps further by giving advice on economical feeding and improvement of the herd. Such organizations are of much value to the breeders and community.

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How to Measure Milk and Butterfat Production.—Each club member should have a milk scale hanging in a convenient place so that after milking the milk can be weighed. Milk sheets for recording the weights are furnished by the Agricultural College Extension Service, University of Nebraska, as a part of the club supplies.

Equal samples from the night and morning milkings should be taken one day each month and tested for butterfat. The first sample should not be taken until a week after freshening and samples taken four weeks apart thereafter.

Great care must be exercised in taking the sample. A true sample

Fig. 17.—Conducting Babcock test
is all that should be used. After the heifer is milked dry, take her total amount of milk, pour it from one pail to another three or four times and then take the sample. If the samples are not properly taken, the results will be misleading.

In case the club member's father is a member of the dairy herd improvement association, the cow tester can test the milk for the club member. If this is not the case, then arrangements can be made to have the samples tested at a local creamery, milk station, or cream station. It is possible for the club member or the club to own a testing outfit. The club leader can assist in securing the proper equipment for this work.

After the sample is tested, the amount of butterfat produced during the month may be computed. For example: if the heifer produced 800 pounds of milk during the month and the test showed that it contained 4 per cent butterfat, the amount of butterfat produced for the month is 4 per cent of 800 pounds or 32 pounds.

**Fitting the Dairy Calf for Show**

The primary object of showing animals in competition is to encourage the breeding and feeding of improved types of livestock. This is best accomplished by our modern show where large numbers of animals can be exhibited and compared.

Comparative judging will bring to light the strong and weak points of the calves. If a club member is progressive and alert, he can profit by the experience he gets from showing his calf in competition with others. Showing also creates the desire to own and breed better dairy cattle.

There are several important factors in fitting animals, namely, feeding, growing, washing, blanketing, clipping, polishing horns, and feet.

**Feeding.**—Active preparation for showing begins eight or ten weeks before the exhibitor expects to show his calf. The animal should look its best, which implies careful feeding and management. Getting a young dairy calf in the proper flesh and condition to show is no easy task. The calf should not be too fat, but should carry enough flesh to give it a good, healthy sleek appearance. Careful feeding of grain two months before showing should accomplish the desired results. The ration should be one that stimulates growth rather than excess flesh.

A fitting ration of 5 parts bran, 3 parts ground oats, 1 part ground corn, and 1 part linseed oil meal is often used. The amount to be fed should be governed by the condition of the calf. Good judgment must be employed since no rule for feeding will fit all individuals and conditions. Feed plenty of good alfalfa or other legume hay in case alfalfa is not available.

The calf should be housed during the day in a well-bedded and well-ventilated stall. This practice should be adopted when the weather is hot and the flies bad. In case box stalls are not available, an open shed or other building can be used. Darkening the stall with burlap sacks placed over the door or openings will help to control the flies and make the calf more comfortable.

If pasture is near, it is well to turn the calf out at night for exercise and grazing. The exercise is essential to good health and appetite. Plenty of fresh water should be available at all times. If the calf is watered from a pail, the pail should be scrubbed out every few days. Keep salt blocks or salt in a box before the animal at all times.

**Washing.**—The only way an animal can be kept entirely clean is by washing off the dirt and stains that cannot be removed by brushing. The animal should not be washed too often since washing tends to make the skin dry and the hair loses its luster. One or two washings in a season is often enough.

In washing, first wet the animal, then work up a lather all over the animal's body with the use of tar soap. The lather should be well worked into the hair and hide. After the dirt is well loosened, the soap should be rinsed out thoroughly.
Dry the hair by rubbing with a soft cloth. The switch should be made clean and fluffy. In order to do this, wash it out the day before showing and while wet braid it tightly, tie a string on the end and leave over night. About an hour before going into the show ring, un-braid, comb, and fluff the tail out.

Blanketing.—All good showmen have their animals blanketed early, several weeks before showing. This is a very important factor in fitting. Blanketing keeps the animal clean and protects it from flies. In case the dairy calf has a thick, heavy hide, blanketing will help to soften it and improve the condition and quality. Burlap bags sewed together make a satisfactory blanket. It is a good practice to remove the blanket each day and brush and groom the animal. This gives the hair and hide a chance to air out.

Clipping.—Unless the hair is short and sleek, it is usually advisable to clip the club calves all over six weeks before showing. From this time on the calves should be kept in a cool, comfortable stall during the heat of the day as a protection from flies and heat. The second clipping should be done two or three days before showing. It may not be necessary to clip the calf’s body; however, the head, ears, neck, tail, and underline should always be clipped. This second clipping gives the animal a dressed up appearance and helps bring out dairy character. In doing this work be sure the clipper is properly adjusted and that it is doing good work. A poor job of clipping is worse than no clipping at all and often spoils a calf’s chance in the show ring. The last clipping should be done so as to even up the calf’s lines, straighten up the top line, and smooth up the tail setting. Clip against the grain of the hair. All producing females should be clipped under the body. This gives a more clean-cut appearance and shows up the veining to a greater advantage.
**Polishing Hoofs and Horns.**—Neat, shapely horns add to the appearance of the dairy calf. If the horns are out of shape, horn trainers put on early will help to correct this condition.

In trimming or dressing up the horns it may be best to use a rasp first. This will take off all the rough and uneven parts of the horn. Sometimes a steel scraper is used instead. This operation should be followed with common sand paper to make the horn smooth. After this use fine emery paper.

In order to bring out a shiny appearance, the horns should be polished by the use of a flannel cloth and sweet oil. With the first strip of flannel see-saw the horn for three or four minutes. This operation can be repeated as often as the caretaker desires. The last strip of flannel should be used dry. Continue rubbing until the proper polish is obtained.

The feet of the calf often grow uneven and sometimes badly out of shape. The beginner should study the natural shaped foot, so when the time comes to trim and shape the feet of his calf he will know how to go about it. Several things should be kept in mind. First, keep the sole level; second, trim down the side walls; third, lower the heels and have the points of the toes even. A pair of pincers and a rasp are the tools needed. The polishing requires about the same procedure as the work on the horns.

**Training the Calf.**—Successful showmen start early to teach the calf to lead and pose. Training animals to behave and respond to certain commands takes time and patience. In the first place, have the confidence of the animal with which you are working. Give it time to learn.

Leading the calf is one of the first steps in training. This is often easily accomplished by leading the calf to water or to pasture. Leading and posing the calf a little each day is a good practice. In a very short time the calf will learn to walk, stand, and place its feet with very little effort on the part of the showman.

In posing, place the feet so that the top line is straight and the rump is as level as possible. Keep the head up and the calf alert. Take every opportunity to show the calf to visitors. This has a tendency to get the calf accustomed to strangers and helps later on in showing.
Showing the Calf

In the show ring, walk on the left side in leading. Hold the lead rope in the hand nearest the calf. Coll the extra rope and hold it in the same hand. Keep an eye on the judge. Of course, pay attention to the calf to make sure she is correctly posed and looking her best. As soon as the calf is in a correct position, do not try to move or change her. Some showmen have a tendency to fuss with their animal too much. From the time of entering the ring until the ribbons are placed, give all attention to showing. Never stand between the calf and the judges. Be ready to walk or move the calf when the judge directs. Never interfere with other showmen and be courteous at all times. Never lead in front of other calves and showmen.

All club members are good sportsmen, so whether winning or losing a good club member should smile and be ready to encourage the less fortunate or congratulate the winners.

Show Ring Classification

Before making entries at local or state fairs, it is well for the showman to know the common classifications. To enter stock in wrong classes is a bother not only to the owner and fair secretary, but to other exhibitors as well. All classes of dairy cattle have the same basis for determining age classification. The first day of August of the year shown determines the age of all senior classes. Example: If an animal is 3 years old on or after the first day of August, that animal will be shown in the two-year-old class, but if three years old on or before the 31st of July, the animal will show as a three-year-old.

Five-year-old Section.—Cows that are five years old or older before August first of the year shown are in this class. It is often called the aged cow class. This section may or may not be included in the classification of all fairs.

Four-year-old Section.—Cows that have reached four years of age before August first of the year shown are in this class. This section may or may not be included in all fair classifications.

Three-year-old Section.—For males and females that have reached three years of age before August first of the year shown.

Two-year-old Section.—For males and females that have reached the age of two years before August first of the year shown. Female class may be divided into two-year-olds (in milk) and two-year-olds (never freshened).

Yearling Section.—The yearling classes are generally divided into junior and senior classes, ages computed February first and August first as in the junior and senior calf classes which follow.

Senior Calf Class.—A calf dropped before the first day of February the year it is shown and on or after August first of the previous year. Example: Senior calves for 1931 must be dropped on or after August first, 1930, and before February first, 1931. At most of the leading fairs there is but one calf class. It is for calves over four months and under one year, using August first as the year determining date.

Junior Calf Class.—A calf dropped on or after February first of the year shown. Example: Junior calves for 1931 should be dropped on or after February first of 1931.

Champions.—In the larger shows there are three championships: junior, senior, and grand. All first prize winners of the various classes compete for championships. All winners of the classes two years old and over compete for senior champion. All winners of the classes under two years old compete for junior champion. Then the junior and senior champions come together for grand champion.

Group Classes.—An exhibitor entering animals in the group classes should read the rules of the fair catalog very carefully. For the beginner these rules are hard to understand and often mistakes are made in making the entries. Also it will be found that fairs differ on their rules and requirements for the group classes.

Graded Herd.—Five animals in group; one bull two years old or over, one cow three years old or over, one heifer two and under three, one heifer one and under two, and one heifer under one year.

Yearling Herd.—Five animals in group; one bull under two years, two heifers over one year and under two, two heifer calves four months and under one year, the heifers to be bred by exhibitor.

Calf Herd.—Three animals in group; one bull and two heifers, all under one year, bred by exhibitor.

Get of Sire.—Four animals, any age, both sexes to be represented, all get of one sire.

Produce of Dam.—Two animals of either sex out of same dam.

How to Care for Common Ailments

The young stockman should keep in mind that an ounce of prevention is worth more than a pound of cure.

Good herd management, good feeding with an abundance of fresh water and plenty of exercise, coupled with the precaution against introducing disease into the herd, will mean more to the stockman's success than any other things he can do.

Young calves, in spite of good care and careful feeding, sometimes get sick and need special attention. In case of diseases other than a few common ailments, it is always best to call a competent veterinarian and have the animal treated in the proper manner. Only a few suggestions can be made here on the prevention of a few of the more common dairy calf ailments.

Scours.—Ordinary scours is one of the most common ailments of dairy calves and is the cause of great losses every year. The trouble may be caused by depriving the calf of the mother's first milk; they should receive such milk for the first three or four days. It might
also be caused by feeding too much milk, feeding at irregular temperatures, milk too rich in butterfat, sour or dirty milk, dirty feeding utensils, or cold, damp, unhealthful quarters. When trouble of this kind occurs it is best to reduce the amount of feed at least one-half. Give one to three ounces of castor oil, which will help to clean the digestive tract. Sometimes the injection of white scours serum is very effective. Bloody scours or coccidiosis is usually caused by a microscopic animal parasite known as coccidia. Any calf affected with scours should be immediately isolated from other healthy calves. Clean up the quarters and make the animal comfortable. If no improvement is noted, call a competent veterinarian.

**Pneumonia.**—Pneumonia is caused by infection. Overheated or poorly ventilated barns or sudden exposure to bad storms may be the predisposing causes. Animals look depressed, breathe rapidly, cough and run a temperature. Animals sick with pneumonia should be made comfortable by taking them away from other animals and put in a dry, well ventilated stall. Allow plenty of fresh water. A veterinarian should be called to administer drugs and give instruction for the care of the very sick animals.

(See University of Nebraska Extension Circular 622.)

**Bloat.**—Due to excessive fermentation of food in the paunch with an accumulation of gas. A great number of things may cause bloat. Animals that are in poor condition and underfed are more likely to be affected. Any green feeds such as alfalfa or clover, when eaten in large quantities, often cause bloat. Great care should be exercised in turning cattle on green, abundant pasture, or in the feeding of too much green feed of any kind. In case an animal is badly bloated it may be necessary to puncture the paunch with a trocar through the left side half way between the hip bone and last rib in order to let the gas escape. In case the animal is not severely bloated, a stick tied in bridle fashion and put in the mouth may assist in relieving the bloated condition.

(See University of Nebraska Extension Circular 622.)

**Ring Worm.**—Ring worm is caused by a fungus and usually appears about the head and neck in the form of a white scaly crust. To treat, remove the crust by washing with soap and water. Then paint the affected area with tincture of iodine; or one part of tincture of iodine and two parts glycerine; or crude oil; or sulphur ointment. Do this once a day for several days. In order to keep the disease from spreading, keep the infected animals separated from the others and thoroughly disinfect the stalls or pens.

**Lice.**—Lice annoy a calf and lower its vitality as well as stunting its growth. They should be gotten rid of at once. Lice may be removed by washing the calf with some coal tar disinfectant used at the rate of 1 part to 50 parts of water. Dry the calf thoroughly after this treatment. Repeat the treatment in about one week. In case the weather is real cold, powdered Sabadilla seed can be dusted into the hair and good results obtained, many stockmen using nothing else. The application of raw linseed oil with a brush every three or four days until four applications have been given is very effective. Do not exercise the animal immediately after oiling. Keep animal away from strong sunlight for twelve hours.

**Poisoning.**—Cattle are very susceptible to lead poisoning. Keep them away from freshly painted barns and sheds, and also away from old paint buckets. Care should be exercised that animals cannot eat poisons put out for rats, gophers, or other such pests.

![FIG. 28. Stanchions prevent calves from sucking and licking after they have received their milk.](image)
Warts.—Warts are very common on young cattle. They are caused by a virus which is easily spread from one animal to another. In case a calf has some warts growing on its body, the caretaker should be careful when grooming not to scratch the animal's body in other places since the virus will be carried to the injury and other warts started. They can be removed by applying castor oil. Applications should be made until the warts disappear. Long warts which "hang down can be clipped off with a pair of scissors.

Sore Eyes.—Young calves often get sore eyes and there are several causes for this trouble. In the summer time it may be caused by flies, injury or infection. The condition can be helped and often cured by bathing the eyes with a dilute salt solution or boric acid.