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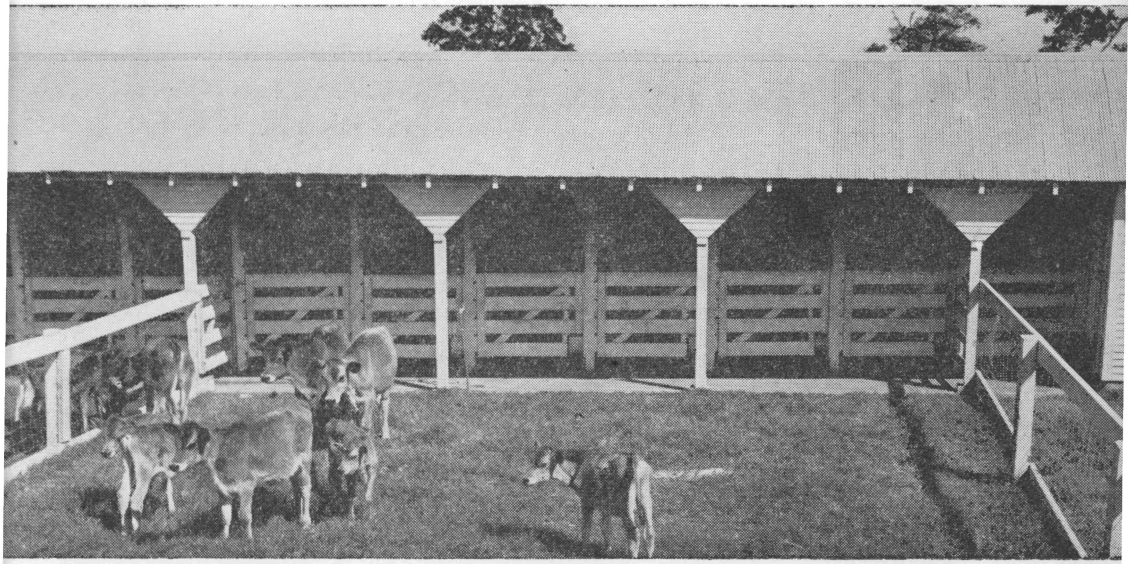
Raising Dairy Calves to Weaning Age



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ON THE COVER

This group of calves was used in a feeding experiment at the Texas Agricultural Experiment Station.

CONTENTS

DO'S AND DON'TS OF CALF RAISING

1. Feed the dam's milk for the first four days.
2. Do not overfeed with milk or concentrates.
3. Use only clean and sterile pails for milk feeding.
4. Feed fresh sweet milk at a constant temperature (98° F.) and at regular intervals.
5. Do not feed silage to young calves.
6. Feed young calves either whole or coarsely ground grains.
7. Feed a vitamin A supplement when whole milk is not available.
8. Start feeding a high quality non-legume hay at two weeks of age.
9. Provide a clean, dry shelter of sufficient size to avoid overcrowding.
10. Provide a paddock with ample shade and fresh water.
11. Separate calves after feeding milk by the use of individual stalls or stanchions.
12. Keep all ailing calves in strict isolation to prevent the spread of disease.

Raising Dairy Calves to Weaning Age

by
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Introduction

At least one-fifth of the average dairy herd must be replaced each year. Profit from the dairy herd depends largely upon high production per cow. Since high producing replacements usually can not be purchased, they must be raised. Due to the high mortality rate in young calves, the cost of raising replacements in Texas is abnormally high. This publication contains proved information which can be used to advantage by dairy herd owners for more successful calf raising.

Care of the New Born Calf

Strong and healthy calves are born from cows which are free from diseases and have been well fed and cared for prior to calving. Accurate breeding dates should be kept so that the approximate calving date will be known. At calving time cows should be isolated from the remainder of the herd and housed in a clean, dry place during bad weather. In good weather, they may be placed in a maternity pasture located so that the cows can be kept under close observation at calving time as aid sometimes is needed. Otherwise both the cow and calf may be lost due to neglect.

Calves born from cows which have been off green pasturage for 30 days or longer before calving should be fed one tablespoonful daily of a good stock grade of cod liver oil in the milk to supply the vitamin A requirements. Vitamin A deficiency in young calves promotes general weakness and susceptibility to scours which often results in death. Calves fed on whole milk produced by cows on green pasturage do not need a vitamin A supplement.

The new born calf should be placed in dry and clean quarters free from flies. The naval cord should be clipped with a pair of sterile scissors about two inches from the base and then disinfected with a mixture of equal parts of tinc-

ture of iodine and glycerine. Do not attempt to tie the cord.

Feeding Young Dairy Calves

Milk Feeding

The young dairy calf should receive its mother's milk for the first four days then whole milk from the herd will be satisfactory to use. The first milk (colostrum) produced by a cow after calving is quite different in composition from normal milk and is essential in starting the digestive system of new born calves functioning in a normal manner. If, for any reason colostrum milk is not available, the new born calf should be given a tablespoonful of castor oil daily for the first two or three days after birth.

Any setback in the growth of young animals has to be made up during the growth period or else the animal will be permanently stunted and undersized. Such cows are not likely to be profitable producers.

The following methods have proved satisfactory in raising young dairy calves:

Nurse Cows

Many dairymen use this method of raising their young calves. A cow producing three gallons of milk per day should furnish enough to adequately feed four calves, figuring six pounds of milk for each calf. These calves should normally be removed from the cow and placed solely on supplemental feeds at 12 to 14 weeks of age.

The advantages of using the nurse cow method are that less manual labor is required in feeding and caring for the calves. Furthermore, less difficulty with calf scours is likely, and it will result in better growth and development of the calf.

The disadvantage of the nurse cow method is that it increases the cost of calf raising since whole milk is more expensive than skim milk or milk substitutes.

Hand Feeding

Hand feeding is the method more universally used because it decreases the cost of calf raising. In hand feeding certain precautions are essential for this method to be successful.

1. Feed the dam's milk for the first four days.
2. Feed milk of the same temperature it is drawn from the cow, about 98° F.
3. Do not over feed.
4. Feed from clean and sterile pails.
5. Feed at regular intervals. Calves under one week of age should be fed three times daily and over one week of age fed twice daily.

At birth the calf should be separated from the dam as soon as possible. This will prevent the calf from getting too much milk which will likely result in scours. It will be easier to teach the calf to drink from a pail if it is not permitted to nurse.

Where calves are fed from pails it has been found to be a good practice to elevate the pail so that it will be necessary for the calf to hold its head as high as its body while drinking. This makes the calf drink slower and is a means of avoiding some of the digestive upsets which occur.

Within recent years a special type of calf feeding pail has been developed with a rubber nipple on the side at the bottom of the pail. This is being used with satisfactory results.

Feeding Schedule for Jersey and Guernsey Calves

1-7 Days of age—2 lbs. milk three times daily

7-14 Days of age—3 lbs. milk two times daily

14-21 Days of age—3½ lbs. milk two times daily.

At 21 days of age the calf can be started on skim milk or a milk substitute.

Feeding Skim Milk

Calves can be raised as successfully on skim milk as by any other method. Skim milk fed calves do not show as much bloom and finish as whole milk fed calves but experiments show that they develop into just as good cows.

As indicated in the following feeding schedule, whole milk should be fed for the first 21 days, then gradually changed from whole milk to skim milk which should be fed at the same temperature as the whole milk:

Feeding Schedule Changing to Skim Milk for Jerseys and Guernseys

Age in days	Lbs. whole milk	Lbs. skim milk
21	7	1
22	6	2
23	5	3
24	4	4
25	3	5
26	2	6
27	1	7
28	0	8
28-60		8
60-90		10
90-120		12
120-150		14

Feeding Schedule Changing to Skim Milk for Holsteins

Age in days	Lbs. whole milk	Lbs. skim milk
21	8	1
22	7	2
23	6	4
24	4	6
25	3	8
26	2	10
27	1	11
28	0	12
28-60		12
60-90		14
90-120		15
120-150		16

The above feeding schedules have proved satisfactory for the average calf. Some of the undersized and weaker calves cannot be fed according to these schedules without scouring, in which cases the amounts fed should be reduced.

Do not feed more than two gallons of skim milk per day at any time. Make sure that the skim milk is clean, sweet and at the proper temperature when fed. Where skim milk is obtained from a milk plant it should be pasteurized before feeding.

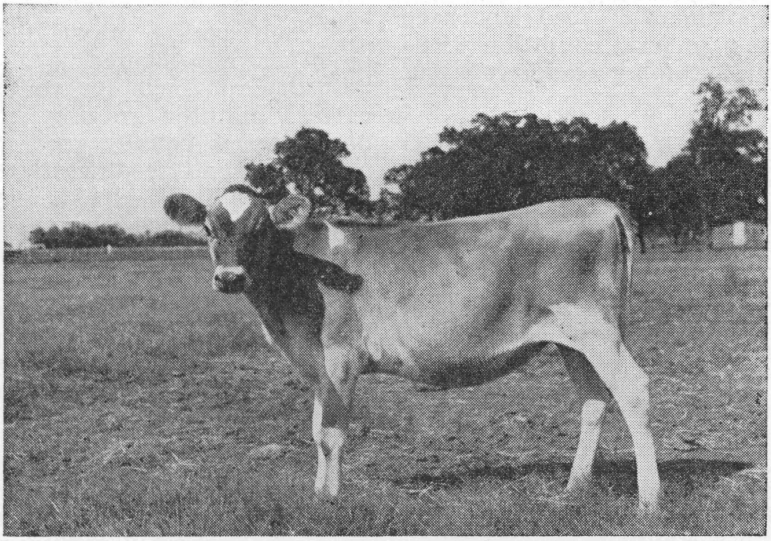
Feeding Milk Substitutes

A number of feed manufacturers make and sell calf starters or milk substitutes which, according to various reports, have given satisfactory results. Some of these starters are prepared and sold as meals while others are in small pellet form. Directions for feeding these commercial milk substitutes have been worked out by the manufacturers and are furnished along with the feed.

A milk substitute has been developed by the Texas Agricultural Experiment Station and used in an extensive calf feeding experiment. This milk substitute was compared with skim milk and found to be as satisfactory for promoting normal growth in young calves and as palatable as skim milk. This milk substitute was fed at approximately two-thirds the cost of skim milk powder. The substitute used contained the following ingredients:

20% Skim milk powder
18% Fifty-four percent protein cotton seed meal
15% Soy bean meal
15% Linseed meal
10% Dried whey
7% Alfalfa leaf meal
7% Red dog flour
6% Hominy feed
1% Oyster shell flour
1% Salt

The above mixture should be fed as a gruel using one pound of the mixture to one gallon of water. It is more easily mixed with water than is the skim milk powder. The gruel should be fed at the



Calf No. 603, shown here at six months of age, was raised on milk substitute.

same temperature that whole milk is fed and according to the following schedules:

Feeding Schedule Changing to Milk Substitute for Jerseys and Guernseys

Age in days	Lbs. whole milk	Lbs. gruel
21	7	0
22	6	1
23	5	3
24	4	4
25	3	7
26	2	8
27	1	9
28	0	9
28-60		9
60-90		11
90-120		13
120-150		15

Feeding Schedule Changing to Milk Substitute for Holsteins

Age in days	Lbs. whole milk	Lbs. gruel
21	8	
22	7	1
23	6	3
24	4	4
25	3	8
26	2	9
27	1	10
28	0	12
28-60		14
60-90		14
90-120		16
120-150		16

Dairy authorities agree that the most economical method of raising young calves to the stage of young producing cows

is to supply them with enough supplemental feed to keep them in good condition without becoming excessively fat.

Grain Feeding

Calves will begin to eat a small amount of a grain mixture at from two to three weeks of age. Jersey and Guernsey calves will eat about one-fourth pound per day at about one month of age and this amount should be increased gradually up to three pounds per calf daily at weaning age. Holstein calves start on about the same amount but the allowance fed should be increased at a faster rate than for Jerseys and Guernseys. Holstein calves should be consuming about four pounds daily at weaning age. The following grain mixture is recommended:

50% Yellow corn chops (or grain sorghum)
25% Ground oats
13% Wheat bran
10% Cottonseed meal
1% Oyster shell flour
1% Salt

The grain mixture should be fed twice daily. The most suitable time is immediately after feeding milk or the milk substitute. Keeping the calves separated and feeding grain at this time will aid in preventing the calves from sucking each other. The grain mixture should be fed to each calf individually in separate mangers or feed boxes.

Roughage Feeding

A high quality prairie hay or other non-legume is the best dry roughage for young calves. Johnson grass or sudan grass is equally good as a hay for calf feeding if cut before heading. Alfalfa hay tends to produce scours in young calves and should not be fed mixed with some non-legume hay. All hay fed to young calves should be free from dust and mold and kept before them at all times so they can eat at will.

Silage has not been found to be a satisfactory roughage for calves under weaning age. On the other hand pasturage should be furnished if possible. It is best to have two small pastures so the calf herd can be alternated between them, and as an aid in preventing contamination with disease organisms. The benefits a young calf obtains from good pasturage are not necessarily the food nutrients supplied by the grass because the young calf does not eat much grass. However, the exercise, sunshine, and vitamin A from the little grass they do eat are decidedly beneficial.

Housing Dairy Calves

An inexpensive open shed constructed so that it can be kept clean and dry is satisfactory for calves. A hard surface floor is essential for strict sanitation. During cold and wet weather, straw or other

satisfactory bedding material should be used. Soiled bedding should be removed daily and replaced with clean, dry bedding material.

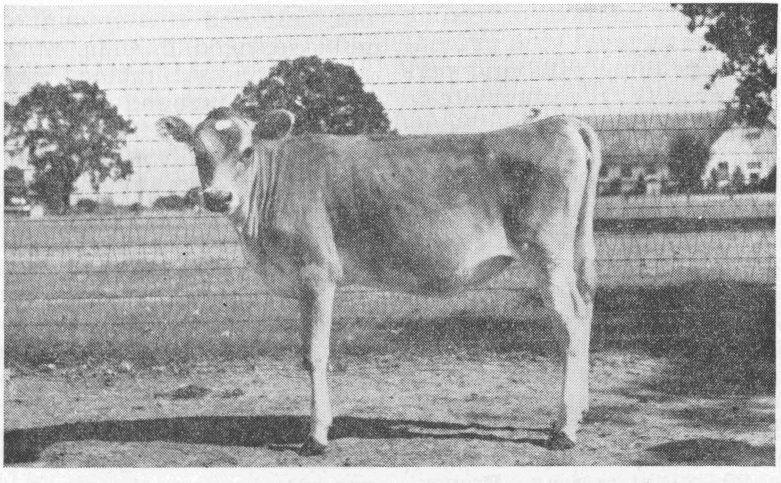
Both the calf barn and paddock should be provided with watering troughs so that fresh, clean water is available at all times. Temporary shades should be provided for the calves if shade trees are not available.

Identification and Dehorning

Identification of the individual animal is important not only in registered herds but in grade herds as well. Identification marks should be established for each individual calf as soon after birth as possible. A tattoo in the ear for Jerseys and Guernseys and a metal tag in the ear for Holsteins are the most common means of identification.

While some breeders feel that it is necessary to keep horns on show cattle, this point is gradually losing its significance.

Where cows are to be handled loose dehorning is essential as a means of preventing injury and conserving feed and shelter space. This is most easily done when the calves are about three or four weeks of age. Caustic potash is effective as a dehorning agent when properly used. The hair around the horn buttons should be clipped and the buttons scraped with a sterile knife until red and about to bleed. Apply the stick of caustic potash until the entire surface of the button has come in contact with it. Apply vaseline around the edges



Calf No. 606, shown here at six months of age, was raised on skim milk.

of the clipped area at the base of the horn button to limit the extent of the burn. Do not apply too much caustic because unnecessary burning will occur and some of the material might even run on down to the eyes of the calf and result in blindness. The operator should wear gloves to prevent a severe burn.

Prevention and Treatment of Some Common Calf Ailments

Calf Scours

The most common ailment of young dairy calves is scours. There are three different types of scours which may affect young calves. The most prevalent type is **common scours** caused by digestive disturbances. This type may be preceded by or even be the direct result of constipation. The more common causes of digestive disturbances include unsanitary methods of feeding and management such as feeding from dirty pails and permitting filth to accumulate in the calf barn and pen. Feeding too much milk, feeding milk at irregular hours, feeding milk which is slightly sour or milk which is cold at one feeding and warm at the next are poor management practices and conducive to calf scours. Using milk and other feeds which are low in vitamin A will result in low conditioned calves which are more susceptible to any infection which might appear. Preventive measures for common calf scours include the practice of strict sanitation at all times. Use cod liver oil or some vitamin A supplement during the off-pasture season as previously recommended under the discussion on feeding. Feed at regular intervals milk which is sweet and at a constant temperature (98° F.). Be prepared to isolate any sick calves and **keep** them isolated until they have recovered, then thoroughly clean and disinfect the quarters in which the sick animals were kept before allowing other animals access to these quarters.

There are numerous treatments recommended for common scours but the following have given consistently good results: As soon as the first signs of scouring are detected the calf is immediately isolated and given a dose of castor oil. The milk allowance should be reduced about one-half and this amount of milk replaced by lime water (made by saturating some water with ground limestone or oyster shell flour). The substitution of lime water should be continued until noticeable improvement has been made. About 12-24 hours after giving the oil, some astringent should then be given. A small dose of tanniform (teaspoon level full) is a very effective astringent and this dosage should be repeated daily until the bowel movement appears to be normal.

White scours is the most violent and deadly from the diarrhea affecting new born calves. The symptoms include extreme dullness, weakness, prostration, sunken eyes, retracted belly, short and hurried breathing, temperature ranging from 102.4 to 105° F., and listlessness. The excrement is yellowish white, very offensive and profuse. In most cases death occurs within 24 to 36 hours. Preventive measures include changing the calving quarters of maternity cows and injecting new born calves with the white scour anti-serum. As a substitute for the anti-serum preventive 50 to 100 c.c. of the dam's blood may be injected under the skin. A graduate veterinarian should be consulted if one is available for either of these injections. There is no satisfactory treatment for this disease.

Bloody scours or **coccidiosis** is not a frequent disease affecting calves but once an outbreak occurs the premises are always subject to future outbreaks when weather conditions are right. It usually appears during damp and warm weather. The severity of the disease seems to depend upon the virulence of the coccidiosis organisms. Preventive measures include removing the calves from infected grounds when the first signs of the disease appear and dosing each calf with ten grams (2 teaspoonfuls) of sulphur daily. Calves should be allowed exposure to sunlight or given vitamin D supplement such as irradiated yeast if sulphur is fed over any length of time.

Mild cases of coccidiosis often recover in a few days without treatment. In severe attacks intestinal astringents should be given. Enemas of 1% alum may be given. A tablespoonful of powdered catechu daily in a pint of milk has been recommended. At the Texas Station, ten grams of sulphur and five grams of iron sulphate given daily until the blood disappears from the feces has given fairly good results. All sick animals should be held in strict isolation and utmost precautions taken to prevent carrying the infection to the other calves. Since the organism responsible for this condition is elemented in the feces, strict sanitation is essential in its control.

Calf Pneumonia

Calf pneumonia causes severe losses among young calves under certain conditions. It may be either acute or chronic in nature. The acute form usually attacks calves three to six weeks old, although younger calves may be affected. The chronic form is usually seen in older calves.

Prevention consists of avoiding overcrowding, having dry draft-free quarters available, insuring an adequate intake of

vitamin A, and practicing strict sanitation.

Affected calves should be moved to clean, dry draft-free quarters and given nourishing food. Care should be taken to avoid disturbing the calf unnecessarily. Stimulants, such as a teaspoonful of aromatic spirits of ammonia in a pint of milk twice daily, often proves helpful. If the animal shows improvement in a few days, recovery usually follows. Cases showing no improvement within two weeks usually are hopeless. If an animal develops pneumonia it should be immediately isolated and strictest precautions taken to prevent carrying infective material to the remaining calves. In some outbreaks, vaccination with pulmonary bacterins have appeared to be of value. In other outbreaks they were worthless.

Warts

Warts appear on the skin on various parts of the body, especially in the regions of the eyes and lips. Sometimes they may be made to disappear by rubbing with castor oil each day. Since tumors which tend to spread and become serious may be mistaken for warts, it is best to consult your veterinarian.

Removal of Extra Teats

Rudimentary or extra teats on the udder are unsightly and detract from the appearance of the cow's udder. They generally secrete no milk, or only a very small amount, which may cause annoyance if the teat leaks. These extra teats can be easily removed if done before the calf is one year old. The best method is to throw the calf, apply iodine or any good disinfectant to the teat, then clip it off with sharp sterile scissors.

Lice

Use a mixture of one pound of Derris or Cube powder (5 percent rotenone) to 10 pounds of wettable sulphur. Several chemical supply houses are offering this mixture for sale. If it is to be used dry, the powder should be dusted on the back of the animal. If it is to be used wet, one pound of the mixture should be added to 10 gallons of water and the animal washed. Treatment should be repeated at the end of three weeks in order to kill the lice which hatch after the first treatment.

Internal Parasites

In some parts of the state calves may suffer from internal parasites. Prevention consists of maintaining the calves in clean, well drained pastures that have not been previously used by sheep or older cattle. The water supply should be deep well or other clean source. Do not allow calves to drink from

tanks or surface water. Hay or other feed should be placed in racks off the ground so constructed that they may be easily cleaned.

Cases usually develop in the fall or early winter in calves at pasture. The principle symptoms are: loss in condition, paleness of the mucous membranes and the conjunctiva, temperature normal to slightly elevated and a profuse, watery diarrhea. Later on there may be edematous swellings under the jaw, the so-called "bottle jaw" appearance. The appetite remains good.

Treatment consists of giving a drench of copper-sulphate nicotine - sulphate solution. This is the same preparation used to control stomach worms in sheep and should contain 1.75 percent copper sulphate and 0.8 percent Blackleaf 40. The dosage is 1 c.c. per pound body weight up to 500 pounds. If the animal weighs more than 500 pounds give ¼ c.c. for each additional pound. Phenothiazine also is recommended but should be administered with caution, particularly to weak animals. The dosage is 0.2 grams per pound body weight or 20 grams (⅔ ounce) per one hundred pounds. However, do not give more than two ounces to any calf regardless of size except under the direction of a qualified veterinarian. Under certain conditions this drug may prove toxic to certain calves.

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