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## Raising the Dairy Calf

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RAISING THE DAIRY CALF.

BY E. G. WOODWARD.

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# RAISING THE DAIRY CALF.

BY E. G. WOODWARD.

## WHAT IS THE IMPORTANCE OF RAISING DAIRY CALVES?

There are in Nebraska more than 600,000 dairy cows. The average period of usefulness of the dairy cow is not more than eight years. This means that to maintain the dairy herds of Nebraska at their present size between 70,000 and 80,000 heifer calves must be raised each year. To mate these cows properly with dairy bred bulls will require the rearing of about 8,000 bulls yearly.

Aside from the necessity of maintaining the herds at their present size, the importance of calf raising to the Nebraska dairyman lies in the fact that this is the surest and most satisfactory way of improving his herd. It should be remembered, first, that herd improvement can come only thru the replacing of worn-out or discarded cows by heifers better than the cows they replace. Such heifers are the result of mating a pure-bred bull with a herd of cows from which the undesirable individuals have been culled. It is neither practical nor satisfactory for the dairyman to buy these heifers, because he will usually have to pay more for them than it would cost to raise them, and he has no assurance that heifers which he may buy are well bred.

## WHEN DOES IT PAY TO RAISE A CALF?

The dairyman's main object in raising calves should be to improve his herd. He may also raise stock for sale either for breeding or for slaughter. Under ordinary conditions it will pay to raise every well-bred heifer calf. Heifer calves of inferior breeding and grade bull calves or pure-bred bulls of inferior breeding should not be raised with the intention of using them for breeding purposes. Unless conditions are such that it will pay to raise these for meat it is best to kill such calves at birth. Then they will not leave any inferior offspring in the country.

In order to determine what gains may be produced on dairy calves by the use of skim milk and home grown feeds, three dairy

steers were fed from birth up to about one year of age. Whole milk was fed for about three weeks. The grain consisted of a mixture of 200 pounds of corn chop and 100 pounds of ground oats. The results were as follows:

TABLE 1.—Showing results of feeding three dairy steer calves skim milk up to the age of one year.

Calf	Age	Whole milk	Skim milk	Alfalfa hay	Grain	Birth weight	Final weight	Daily gain
	Days	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Jersey .....	360	258	5,958	1,609	1,178	60*	580	1.44
Holstein-Jersey ...	384	251*	6,366	1,696	1,652	48	750	1.83
Grade Holstein ...	344	245	5,620	1,584	1,238	74	700	1.82

\*Estimated.

#### WHAT IS THE COST OF FEED REQUIRED TO RAISE A CALF?

Where skim milk is available, as it is on most of the farms in Nebraska where dairying is followed, the cost of feed for raising a fall calf will be about as follows:

TABLE 2.—Showing feed requirement to raise a calf up to the age of six months when skim milk is used.

Feed	Amount	Price	Value
Whole milk .....	175 lbs.	\$1.50 per cwt.	\$2.63
Skim milk .....	2,700 lbs.	.25 per cwt.	6.75
Grain .....	125 lbs.	1.00 per cwt.	1.25
Hay .....	450 lbs.	10.00 per ton	2.25
			\$12.88

At the age of six months a skim milk calf should weigh from 250 to 400 pounds, depending upon the size of the breed and the thrift of the calf. Whether or not it will pay to raise steer calves of the dairy breeds or the inferior dairy heifers for meat will depend entirely upon conditions.

In some places whole milk is sold and skim milk is not available. If a calf is raised on whole milk by shortening the milk feeding period to about three months, the cost of feed will be about as follows:

TABLE 3.—Showing the feed required to raise a calf up to the age of six months when a small amount of whole milk is used.

Feed	Amount	Price	Value
Whole milk . . . . .	900 lbs.	\$1.50 per cwt.	\$13.50
Grain . . . . .	250 lbs.	1.00 per cwt.	2.50
Hay . . . . .	600 lbs.	10.00 per ton	3.00
			<b>\$19 00</b>

It may even be possible to raise calves on whole milk with less feed than that mentioned, but in any case the results will be less satisfactory than when skim milk is used and the feeding prolonged to six months.

THE CALF AT BIRTH.

Every precaution should be taken to give the cow about to freshen the most cleanly and sanitary surroundings possible. The cow should be allowed to calve in a clean, freshly bedded stall, or better yet in mild weather, in the pasture. It is essential that surroundings be clean in order to avoid infection of the freshly severed navel cord. The cow will be in better physical condition and will yield more milk if she is dried up about six weeks before calving time than she would if milked up to the time of calving.

RAISING A CALF ON SKIM MILK.

It is now fairly well understood that calves properly raised on skim milk are equally as growthy, thrifty, and vigorous as



Fig. 1.—Skim milk calves.

those raised upon whole milk or those allowed to run with their dams. In fact the skim milk calf will oftentimes show a more rugged framework than a calf raised on whole milk. It is usual, however, for the whole milk calf to appear smoother and more plump, due to the fact that it lays on a greater amount of body fat than the calf fed skim milk.

Except for the fat that has been removed, skim milk is identical in composition with whole milk. When whole milk is taken into the calf's body, the fat of the milk is used to produce heat to keep the calf warm and also to form body fat. This same function can be performed very much more cheaply by starchy grains such as corn, Kafir corn, and oats.

The protein of milk, which is the constituent most concerned in muscular growth and the building up of the vital organs, is equally as abundant in skim milk as in whole milk.

#### TAKING THE CALF FROM THE COW.

It matters little whether the calf is taken from the cow immediately after being dropped or is allowed to stay with its mother for several days. The essential thing is that the calf receive the first milk from its mother. A calf should always receive the milk from its own mother for the first two or three days of its life, because the milk is quite unlike normal milk and stimulates the calf's digestive tract to action.

The earlier the calf is taken from its mother the easier will it be to teach it to drink. When the calf runs with its mother for several days it will learn to drink more quickly if it is not offered milk for 24 to 36 hours after it has been separated from the cow. In most cases the calf will learn to drink quite readily if allowed to suck the feeder's fingers while they are held under the milk.

#### FEEDING WHOLE MILK.

The stomach of the young calf is small, so that it is not able to handle large amounts of milk. Eight to 10 pounds or 4 or 5 quarts per day is the proper amount to feed a young calf. For a very small or weak calf, 6 pounds or 3 quarts is sufficient. The results are probably a little better when the calf is fed three times daily for the first few days. This is not necessary, however, and it is usually best not to feed three times daily unless the milk can be obtained fresh from the cow for each feed. The milk should be divided equally between the feeds so that a calf being fed twice daily would receive 4 or 5 pounds at each feed.

## FEEDING SKIM MILK.

A calf of ordinary vigor can be put on a skim milk diet at the age of two or three weeks. The change to skim milk should be gradual. This change is best made by substituting a pound of skim milk for a pound of whole milk at each feed until the calf is receiving only skim milk.



Fig. 2.—Calves about two weeks old. These are old enough to be fed skim milk.

The amount of skim milk fed should be the same as that of the whole milk which it replaces. This will usually be 10 or 12 pounds for a calf two to three weeks old. A gradual increase in the milk should be made as the calf grows, until at the age of five months it is receiving 16 to 20 pounds daily, depending upon the size of the calf.

## FEEDING GRAIN.

The calf will begin to eat a little grain by the time it is two or three weeks old. After it is a few days old, grain should be kept before it and a little put into its mouth immediately after it has finished drinking its milk to aid it in learning to eat.

The grain should always be fed dry and never mixed with the milk. In order that grain be properly digested it is necessary that it be chewed before it is swallowed. Probably the best time to feed the grain is just after the milk has been fed. The calf's appetite is very keen at this time, and it will take to the grain readily.

A good grain mixture to use until the calf has learned to eat well is two parts ground corn and one part crushed oats. When the calf has learned to eat, shelled corn alone will give as good results as any grain that can be supplied.

Up to the age of three months it is well to give the calf all the grain it will eat. At that time it will be eating two to three



pounds daily and may very well be limited to this amount until weaning time.

#### FEEDING HAY.

The calf will begin to eat hay at about the same time as it does grain, and some should be provided for it to nibble.

For the young calf, clover or mixed hay is as good as any. It occasionally happens that where alfalfa hay of the best quality is fed immediately after the milk and grain a calf will gorge itself to such an extent that impaction of the stomach may follow and prove fatal. When very palatable hay is fed, it is well either to supply it in limited amounts or to keep it before the calves all of the time so that they will not gorge themselves at any one time. In any case it is best to feed the hay during the middle of the day and not immediately after the milk and grain has been fed, as such a great bulk all at once proves a severe tax on the digestive system.

#### FEEDING SILAGE.

Silage may be fed with safety to the young calf, and is very much relished by it. It is well to pick the pieces of ear out of the silage fed a young calf. In using silage avoid overloading the calf's digestive system either by offering even only a small amount or supplying it in the middle of the day.

#### WATER AND SALT.

It is a mistake to assume that a calf does not require water because it is receiving skim milk. The calf should have water accessible at all times, as it will drink considerable despite the fact that it is receiving a large quantity of milk.

It is also quite necessary that the calf be provided with salt. It requires salt besides its regular feed, the same as does an older animal.

#### WEANING.

Six months is a very good age at which to wean a calf, tho



Fig. 3.—Calves about six months old. These calves are ready to be weaned.

there is no reason why the feeding of milk should not be prolonged beyond this time if skim milk is abundant. A calf can be weaned in three or four days' time by gradually reducing the amount fed.

#### SCOURS.

Scours in calves are by far the most common sources of trouble in calf raising. If a feeder is able to avoid the occurrence of scours in his calves, it is very seldom that other ailments will annoy. Scours in calves are of two kinds.

#### WHITE SCOURS.

White scours, or calf cholera, is an infectious disease. The germ of this disease enters the blood of the calf soon after birth thru the freshly severed navel cord. This disease always attacks very young calves, usually appearing within three days after birth. It is characterized by the whitish, foul-smelling dung which the calf passes and a depressed, hollow-eyed appearance in the calf. It is nearly always fatal, and as yet no treatment has been found which will give good results. About the only practical thing that can be done is to avoid the occurrence of this disease by keeping the surroundings of the newborn calf in a sanitary condition. The cow should be allowed to calve in a clean, freshly bedded stall; or in mild weather, in the open pasture. If this disease has occurred on the farm previously, it is well to disinfect the navel cord and belly of the freshly born calf with a 3 per cent solution of creolin or 3 per cent carbolic acid and bind the cord up to the belly with a wide strip of muslin to avoid later infection

#### SCOURS FROM INDIGESTION.

The common cause of scours is indigestion, or inflammation in the stomach. This may be brought about by a large variety of causes, but in any case the aim of the treatment should be to remove the source of the inflammation. As in most other ailments, half of the battle in curing scours is to begin treatment as soon as any trouble is noticed. The calves should be watched closely and treatment administered upon the first indications of scours. Treatment should always begin by cutting down the ration, thus giving the calf a chance to rid itself of the irritating material. The milk should be cut down at least one-half and in severe cases withheld entirely. In most cases after one or two feeding periods have passed, the calf will appear normal, and full feeding can be gradually resumed.

In more obstinate cases it may be necessary to administer a

physic of 2 or 3 ounces of castor oil given in a little milk. After a calf has suffered with scours, feeding should always be light for a few days until the calf regains its strength.



**Fig. 4.**—This picture shows the effect of scours on the growth of a calf. These are both pure-bred Jersey calves. The calf at the left of the picture is 34 days older than the calf at the right but weighs less. When about two weeks old it suffered from a very severe attack of scours and has not fully recovered from the effect.

#### SPECIAL POINTS TO OBSERVE.

Common scours give more trouble in calf raising than any other one thing. Scours may be caused or at least favored by a variety of conditions.

#### CONDITION OF THE MILK.

To avoid scours it is essential that the condition of the milk be controlled. Milk should always be fed sweet if good results are to be obtained. While it is known that healthy, vigorous calves may be raised on sour milk, it is not a good policy to try to feed it, because it is often impossible to obtain properly soured milk. Milk that has been allowed to stand around until it is half rotten is quite different from normal sour milk tho it may have a sour taste, and it is almost sure to cause trouble if fed to calves. Sweet milk is very much more dependable in quality and should therefore be used exclusively.

#### CLEANLINESS OF PAILS AND UTENSILS.

Scours are often caused, no doubt, by a filthy condition of the feeding pail or trough. Unclean milk or milk out of unclean

vessels will cause trouble. It is best to give the calf pails the same treatment and attention accorded the regular milk pails. They should be kept sweet smelling.

**TEMPERATURE OF THE MILK.**

Milk should always be fed at a temperature near that of blood heat, or between 95° and 100° F. This is the temperature at which the calf would receive the milk if it were sucking the cow. Cold milk taken into a young calf's stomach so chills it that digestive processes are checked for a time and digestive disturbances are liable to follow.

Calves that have reached the age of two and one-half or three months may be fed milk somewhat colder than 95°, but in any case the temperature should be constant and a calf should not receive warm milk at one feed and cold milk at the next.

A thermometer should actually be used in testing the temperature of the milk—at least often enough so that the temperature can be estimated fairly accurately.

**OVERFEEDING.**

Probably the most frequent cause of scours is overfeeding. When properly fed the appetite of the calf will be more keen after taking its milk than before. It is impossible to satisfy a calf's appetite for milk without overfeeding it. Overfeeding at any



**Fig. 5.—Calves in stanchions at feeding time. The milk is weighed for each calf. Each calf receives the proper amount and no more.**

particular feed is best guarded against by actually weighing the milk at each feed or measuring it in a vessel sufficiently small to avoid guesswork. Weighing is to be preferred, as the foam which occurs on separator milk makes accurate measuring difficult.

If several calves are being fed in the same pen it is best to have ties of some sort for them so that each calf may receive only its apportioned feed. For this purpose small, rigid stanchions are the most convenient. If the calf is kept tied until after the grain is eaten, there is less likelihood of it forming the habit of sucking other calves' ears.

Overloading the calf's stomach in the morning and evening should be avoided by feeding the roughage thru the middle of the day.

#### FEEDING FOAM TO CALVES.

On skim milk fresh from the separator there is always more or less foam. Large quantities of this foam fed to a calf will cause it to become bloated and may even cause sickness. The little that the calf will ordinarily receive with its milk will cause no trouble.

#### CALF PENS AND LOTS.

Dirty, muddy, or uncomfortable quarters are favorable to scours. Calves should not be turned out into muddy or wet lots where they will not have a dry place in which to lie. In fact young calves up to three or four months of age will thrive fully as well in a roomy, clean, and well-lighted stall as on pasture. The young calf should be especially protected from quick changes in temperature and cold drafts, which are liable to bring on pneumonia.

#### VIGILANCE ON THE PART OF THE FEEDER.

One very important rule to follow in calf feeding is to be constantly on the lookout for disorders. Prevention of sickness is far better than curing it. The feeder should always observe the keenness of the calf's appetite and the character of the dung. At the slightest hint of any disturbance the amount of milk should be cut down.

#### DEHORNING THE CALF.

Dairy cows should be dehorned, because dehorning makes a cow more docile, easier to handle and feed, and also makes it impossible for her to injure the udders of other cows with her horns.

Possibly the most satisfactory way to dehorn a calf is to apply caustic potash. Caustic potash can be obtained at almost any

drug store. It usually comes in the form of sticks about the size of a lead pencil. The calf should be treated when one or two days old or as soon as the starting horn can be located.

To dehorn the calf, clip the hair from the spot where the horn is starting. Then wet the end of a stick of caustic potash and



Fig. 6.—This calf was dehorned by means of caustic potash. The poll is perfectly smooth.

rub on the budding horn until a sore spot about the size of a dime is produced. The operation can be hastened by breaking the skin before rubbing on the potash. The calf should not be turned out into the rain immediately after caustic potash has been applied, as it may be washed down into the calf's eyes.

Caustic potash should be handled by wrapping a piece of paper around the stick. It must be kept in a tightly stoppered bottle, or it will absorb water from the air and dissolve.

#### RAISING A CALF WITH WHOLE MILK.

Where whole milk is sold and none of the milk is skimmed, the raising of calves is decidedly more expensive than where skim milk is abundant. Ordinarily the calf must be fed milk until it is two and one-half or three months old before it can be expected to live on a grain and hay diet. This will require 750 to 1,000 pounds of milk, worth at \$1.50 per hundredweight from \$11.25

to \$15. After the first two or three weeks, a calf will do equally as well on skim milk as on whole milk, so the expense can be cut down possibly one-third to one-half by skimming the milk and selling the butter fat.

A calf two and one-half to three months old is able to get along without milk if fed liberally of grain. The gains, however, will not be so satisfactory as those of a calf weaned at a later age. For the calf after weaning at this age, alfalfa hay, silage, and 3 or 4 pounds of a grain mixture made up of 2 pounds corn chop, 2 pounds ground oats, and 1 pound oil meal is very good to use for two or three months. However, the practice of weaning a calf so early is not to be recommended.

#### RAISING A CALF WITHOUT MILK.

It has been found possible by careful handling to raise calves without milk after three or four weeks old. Such calves are usually badly stunted but may recover from the effects to some extent if well fed in later life. It is not practical to raise calves in this way.

#### CARE OF THE DAIRY HEIFER.

Altho the first few months of the heifer's life is the most critical period of her existence, still many heifers are stunted, due to lack of attention after being weaned.

#### THE EFFECT OF TIME OF BIRTH ON GROWTH.

It is a rather common practice to have cows calve in the spring, yet this is not usually the best time. It is a fact that a calf born in the fall will get a better start in life than one born in the spring.

It makes little difference in the rate of growth of a calf whether it has pasture or has only dry feed in connection with its milk. But after weaning time the calf that has pasture will make by far the cheaper and more rapid growth. A fall calf will also be ready for breeding so that it will drop its own calf in the fall at the age of about two years.

Furthermore, a cow will give best returns when freshening in the fall. This is true because it is usually easier to maintain a steady flow of milk thru the winter and early spring than during the summer and fall. Also, dairy products demand highest prices during the winter.

#### FEEDING.

Until a calf is weaned it receives a liberal allowance of protein in its milk, but when milk is removed from the ration it is necessary to supply protein in some other form, such as legume

hay or a high protein concentrate. It is advisable to keep the heifer in a thrifty, growing condition, altho there is no need of fattening her. However, if she does become rather plump it will not injure her dairy qualities.



Fig. 7.—Well-grown dairy heifers in good, thrifty condition.

If fed so as to induce a thrifty growth yet not produce fat, dairy heifers will gain on an average close to 1 pound daily from the age of six months up to two years or calving time.

**RATIONS FOR HEIFERS FROM SIX TO TWELVE MONTHS OLD.**

Ration I.—About 2 pounds daily of a mixture of 75 pounds corn chop and 25 pounds bran; all the alfalfa hay the heifer will eat.

Ration II.—Six to 10 pounds silage; about 2 pounds daily of a grain mixture of 40 pounds corn chop, 40 pounds linseed meal or cottonseed meal, and 20 pounds bran; all the alfalfa hay the heifer will eat.

**RATIONS FOR HEIFERS ONE TO TWO YEARS OLD.**

Ration I.—About 3 pounds of corn daily; all the alfalfa hay the heifer will eat.

Ration II.—Corn silage, 12 to 20 pounds; about 3 pounds daily of a grain mixture of equal parts corn chop, bran, and linseed meal or cottonseed meal; all the alfalfa hay the heifer will eat.

**BREEDING.**

The proper age at which to breed a heifer will depend very largely upon the size and thrift of the animal as well as upon the breed.

Jersey or Guernsey heifers mature more rapidly than Holsteins or Ayrshires and hence are ready for breeding at an earlier age. The approved practice is to breed a Jersey or Guernsey



heifer at the age of 13 to 17 months. A Holstein or Ayrshire heifer if in good thrift may well be bred at the age of 17 to 21 months.

#### THE YOUNG BULL.

Nothing has been said about the bull calf, but his treatment should be the same as that of a heifer with the exception that it is usually necessary to separate the bulls and the heifers at about six months of age. From this time on it is advisable to feed the

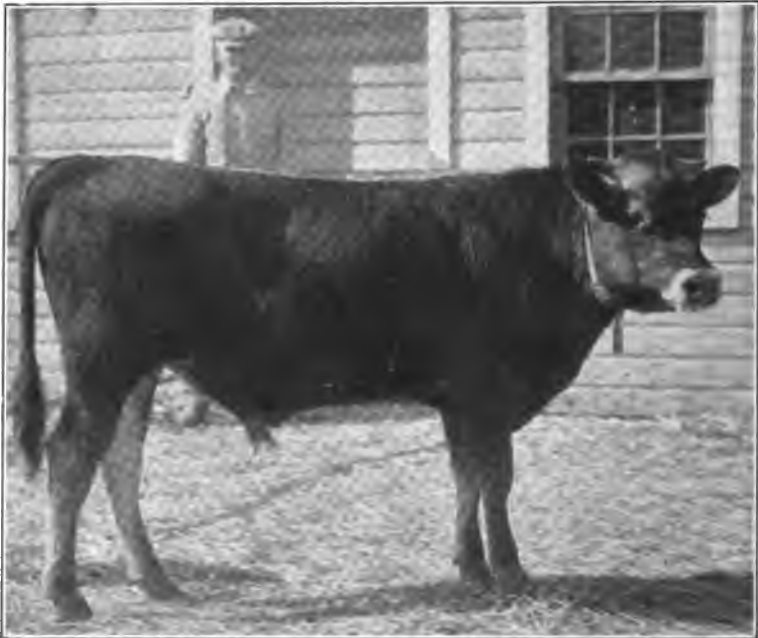


Fig. 8.—Pure-bred Jersey bull, nine months old. This bull is almost mature enough for very light service.

bull somewhat heavier than the heifer so as to induce the greatest possible growth. The same rations recommended for heifers, except in larger amounts, may be used to advantage.

The bull should be ready for very light service at the age of 10 to 12 months. However, his use at this time should be very limited, else his breeding powers may be permanently injured. It would probably be safe to allow him to serve one cow every three weeks up to the age of one year and not more than one cow per week up to the time he is 16 months old.