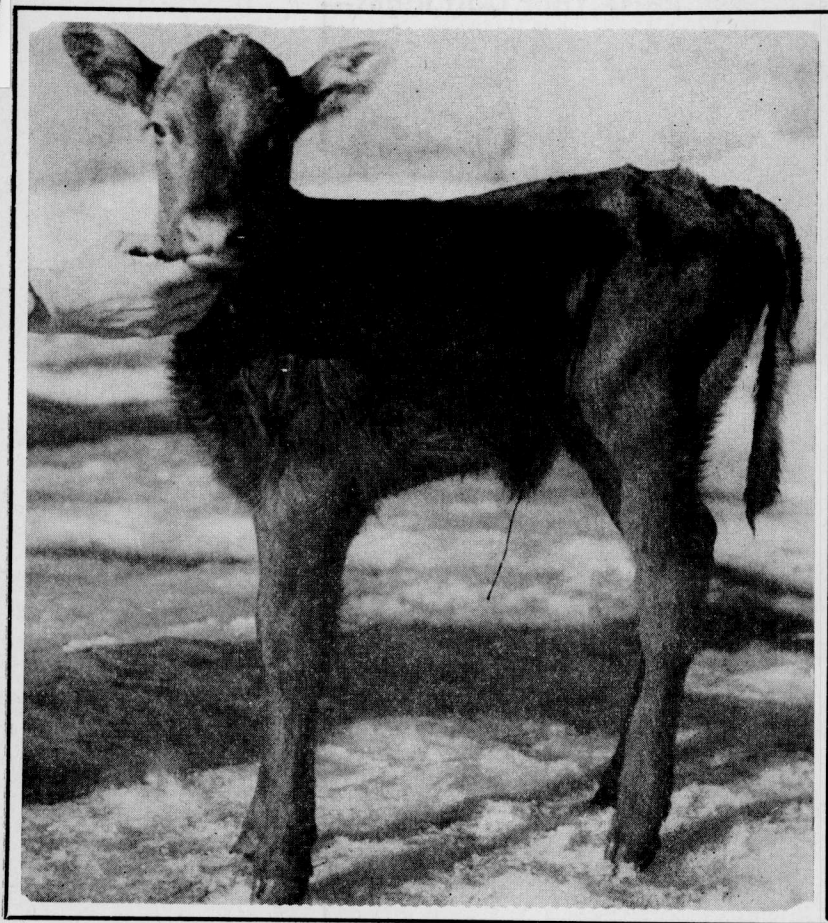
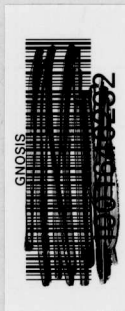


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RAISING DAIRY CALVES AND HEIFERS IN ALASKA



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Raise Your Calf Right—

Feed your freshening cow
Take care of your freshening cow
Give the Calf a good place to live
Teach the calf to drink right away
Start your calf on grain early
Feed your calf roughage within 2 weeks
Remember water and salt
Keep your heifers growing

Raise Your Calf Economically—

Compare these rations:
Whole milk
Skim milk
Skim milk powder
Gruel
Milk-Flo
Calf Manna
Calf meal
Follow recommended feeding program

RAISING DAIRY CALVES AND HEIFERS IN ALASKA

*William J. Sweetman, Wallace R. Middleton
and Fred Swingle**

Raising herd replacements in Alaska is cheaper than buying them from the States. This is especially true when you can produce most of the feed used by the calf and the growing heifer on your own farm. The only sure way to develop and maintain a high producing dairy herd is to breed your cows to high class bulls and raise your own replacements. When properly raised, these heifers will, in most cases, be better producers than those purchased from the States. It is difficult to buy good dairy animals, and there is always the added danger of introducing diseases into your herd when replacements are purchased.

RAISE YOUR CALF RIGHT

Feeding for proper growth and development of the dairy calf begins before it is born.

Feed Your Freshening Cow-

Give the pregnant cow sufficient feed containing adequate minerals and vitamins so that she will be in good flesh at calving time. She should be getting a moderate feeding of grain, usually 2 to 4 pounds per day is enough, during the time she is dry. She should be dry for at least 6 weeks before calving. Without sufficient rest she will not produce at her optimum capacity and the calf is likely to be weak and will not respond to proper feeding and care.

Do not discontinue grain feeding at calving time, but cut down somewhat on the roughage. A warm bran mash or whole oats in warm water may be given to the cow 2 or 3 hours after calving.

Take Care of Your Freshening Cow-

Cows normally calve in 270 to 285 days after breeding. Mark down the breeding date and the prospective calving date so you can watch your cow more closely as calving time approaches. You should be prepared for birth of the calf as much as 15 days before it is due.

If your cow is to calve during the summer, put her in a small, well-grassed plot away from other cows several days before the calf is due. If she is freshening in cold weather, put her in a clean, well-bedded box stall so that she will not drop her calf in a wet, dirty place.

*Head, Animal Husbandry Department; Dairy Husbandman, Matanuska Station; Animal Husbandman, Fairbanks Station, respectively.

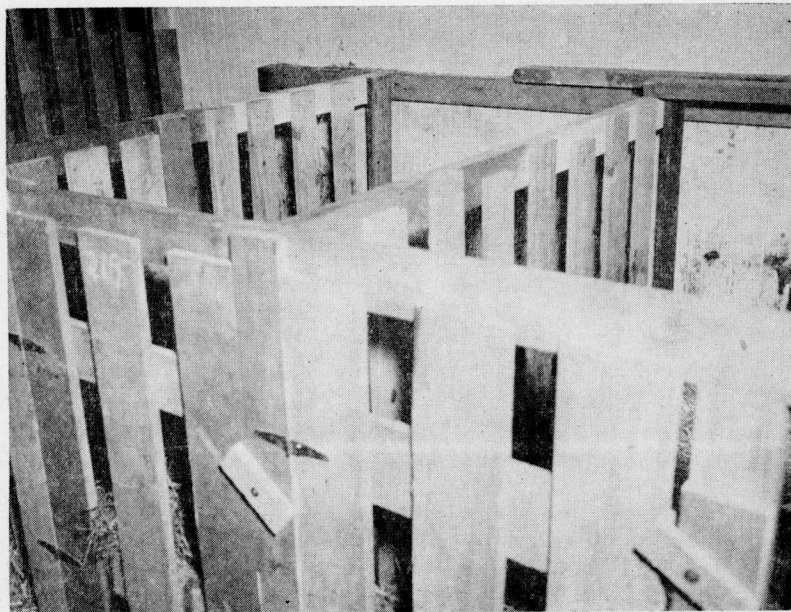
You should watch the cow carefully when calving begins to make sure the birth will be normal. If she needs help, give it without delay. If the presentation is not normal, get the best help available, since it is important that the calving be started properly. If the calf is coming backwards, it must be removed promptly to prevent smothering before it can be born. Many cows and calves are lost needlessly because prompt attention was not given at calving time.

Immediately after the calf is born, make sure its mouth and nostrils are free of membranes and any other foreign materials. Be sure the calf begins to breathe. If it is not breathing, start artificial respiration at once, pumping the lungs up and down with one hand and placing the fingers of your other hand well back on top of its tongue.

Guard against infection by dipping the calf's navel in iodine solution. Keep stall well bedded so the calf will stay dry and clean.

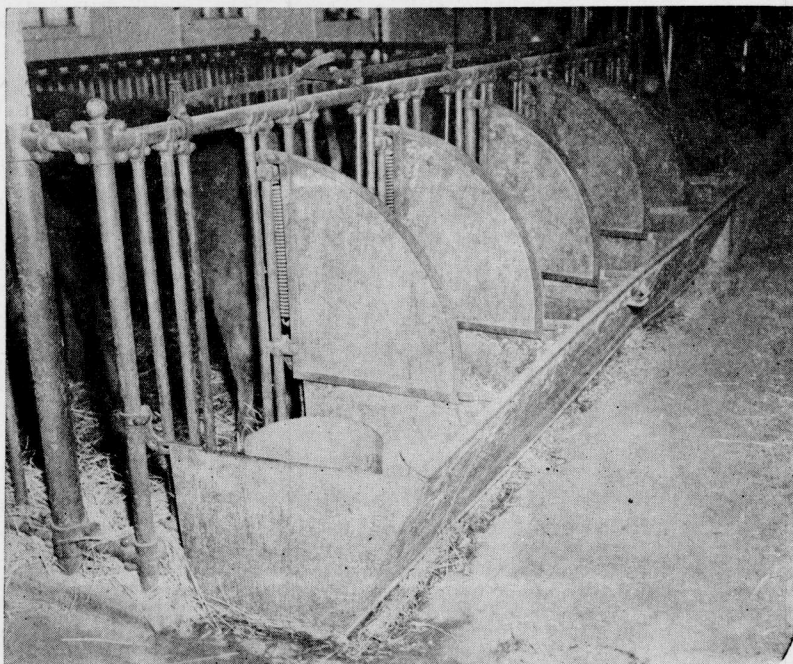
Give the Calf a good Place to Live-

When you take the calf from its mother, place it in a separate pen for the next 30 days so that other calves can't suck it.



Home made single calf pens.

Keeping the calf warm and dry is easier where the pen has a false floor raised 2 to 4 inches above the concrete. This is made by



Mangers and pens for calves 30 days old or older.

nailing heavy, one-half inch mesh wire on the 2x4's, and then placing bedding on the wire. The space under the wire allows liquids to drain away, thus keeping the bedding dry. After the 30-day separation period, you can let the calf run with other calves.

All milk-fed calves should be locked in stanchions for at least an hour after feeding. This keeps them from sucking each other. Blind quarters may develop where the udder is sucked by other calves. The stanchions also should have divisions to keep the calves from sucking each other's ears.

Teach the Calf to Drink Right Away-

Some farmers prefer to leave the calf with its mother for the first 3 days. Others remove it about 12 to 24 hours after birth. Teaching the calf to drink usually becomes more difficult the longer it remains with the mother. Save all the colostrum milk (the first 3 days' milk) taken from the cow. This may be kept to feed the calf for several days. In summer, keep this milk in a cool place; in winter it can be frozen in gallon cans and thawed as needed.

Don't feed the calf for about 12 hours after it is taken from the cow. In other words, miss one feeding and then start teaching it to drink. Back the calf into a corner and straddle its neck so you

can control it. Take some warm, fresh milk in a clean pail in one hand and place the other hand over the calf's nose with one or two fingers in its mouth. When the calf begins to suck your fingers, push its nose down so it will also get some milk around the fingers. While the calf is sucking, gradually remove your fingers from its mouth, but continue to hold its head down gently. If the calf stops drinking, put your fingers back in its mouth and start over. Continue this process until the calf gets the idea and drinks by itself. Usually two or three feedings are enough to teach the calf to drink.

In Alaska, where milk is high priced, the amount fed should be limited to 6 pounds per day for a small calf and 8 pounds for a large calf. Never feed more than these amounts. Instead, start calves on grain and hay as soon as possible. Calves started on skim milk when the colostrum milk is gone should get 10 to 20 cc. (1 to 2 tablespoonfuls of cod liver oil each day.

Start Your Calf on Grain Early-

Start grain feeding a few days after the calf has learned to drink. Put some grain in your hand and rub over its mouth, and also place a small handful in the pail after the milk has been finished. Give the calf all the grain it will eat—up to 3 pounds per day. Don't feed more than this. It will eat more after about 3 months of age, but it should get the rest of its requirements from roughage.

Almost any mixture of farm grains or even a single grain, especially oats, is good for calves. Whole oats fed alone is fine as long as calves get milk of some kind. If all milk is removed at an early age, a grain mixture having some protein supplement should be fed. In Alaska, a good mixture for calves up to 6 months of age is made up of equal parts of ground oats, ground barley, ground wheat, and soybean oil meal, with 1 percent bone meal and 1 percent salt added.

Feed Your Calf Roughage Within 2 Weeks-

When the calf is a couple of weeks old it will nibble on bits of hay. Hay may be fed in slatted racks. Fine stemmed, early cut grass hay such as brome or clover is preferable to oats-and-peas because calves will not eat coarse hay. This is especially true at the start. Give calves all the good hay they will eat. Remove all uneaten hay each day. Calves do not like hay that has been picked over.

Calves fed skim milk must get most of their vitamins from roughage, so it is especially important that they get hay of good quality. Wherever clover can be grown with grass, some should be harvested as hay and saved for calf feed.

After the calves are 3 months old, they can eat good quality silage. It must be free from mold. If necessary, you may substitute silage for all or part of the roughage after this age.

Calves can be pastured in small lots after they are 1 to 2 months old. This saves on harvesting cost and effort. Remember, however, that pasture replaces roughage only. Pasture must be supplemented by grain. Calves under 6 months old should not run with the cows because they will probably start sucking again.

Remember Water and Salt-

Have plenty of clean water available for your calves all the time even when they are getting milk. Also, keep a supply of coarse salt available for them. Young calves usually can't get enough salt from a block.

Keep Your Heifers Growing-

After dairy heifers are 6 months old and until they have calved, they should be kept in a good growing condition. Little grain is necessary to keep them growing if they are on good pasture. If pasture becomes short, you may have to feed additional grain or roughage to keep them in good growing condition. Also give them all the good roughage they will eat during the winter season.

They must be kept growing right up to calving time. If the roughage is poor, you may have to feed some grain. Usually the well-grown heifer that has had large amounts of good roughage and little grain will be better than one raised on poor roughage and large amounts of grain. She will also be less expensive to raise. Heifers raised on low quality roughage and large amounts of grain often will be harder to get with calf.

So, keep them growing, but do not allow them to get overly fat. Well-grown heifers are large enough to breed at 15 to 17 months of age. This will bring the first calf at just past 2 years of age.

RAISE YOUR CALF ECONOMICALLY

In the States, calves are often raised on whole milk, which is generally considered the best diet. Some dairymen who sell butterfat have plenty of skim milk left for calves. Skim milk is usually supplemented to provide a balanced diet. Both skim milk and whole milk are considered fairly cheap calf feeds.

In Alaska a different situation is found. Here whole milk is expensive. The dairy farmer can sell all whole milk at good prices. In the past, many Alaskan farmers have begrudged whole milk or even skim milk for calves. Because whole milk is an expensive feed, many dairy farmers have preferred to buy herd replacements, risking the danger of disease contamination. Another problem is encountered in Alaska, that of the newly arrived homesteader who has no source of milk for feeding a calf.

Is there a cheap way to raise calves without whole milk? Experiments show that good calves can be raised cheaply on several different kinds of feed.

Compare These Rations-

Study table 1 a minute. This table summarizes the results of five different starting rations that have been successfully used to raise good calves.

In the first column are listed the rations. In these experiments, for example, 4 newborn calves were started on fresh milk right away. As they grew older, grain was added to their ration, and finally oat-pea hay. Whole milk and skim milk were finally withdrawn when the calves were 150 days old. Powdered skim milk in both dry and liquid rations was likewise supplemented by grain and oat-pea hay as these calves grew older. The mixture for the grain supplement for these four diets was:

Ground barley	32 pounds
Ground oats	31 pounds
Ground wheat	8 pounds
Fish meal	4 pounds
Linseed meal	3 pounds
Bone meal	1 pound
Salt	1 pound

The calves on the last ration listed in table 1 were fed a gruel made of 45 pounds of ground grains (barley, oats, and wheat in equal parts) 25 pounds of dried whey, 20 pounds of linseed meal, 9 pounds of meat meal and 1 pound of bone meal. These ingredients

TABLE 1. *Weight gains and costs of raising calves to 6 months on five different starting rations. Matanuska Experiment Station, 1939-1945.**

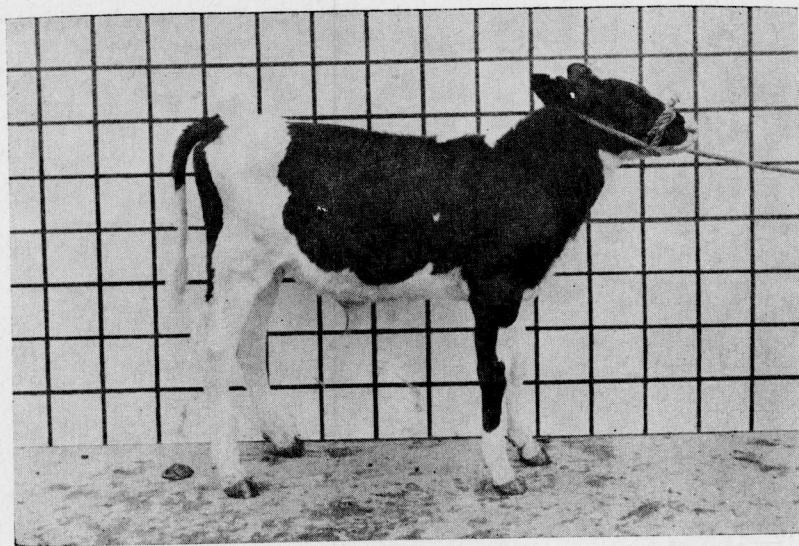
Starting ration**	Number of calves fed	Average total gain per calf over initial weight in pounds	Cost per calf†
Fresh whole milk to 150 days	4	264.6	\$210.47
Fresh skim milk to 150 days	8	238.0	100.55
Skim milk powder in water to 90 days	11	235.8	65.97
Whole milk to 40 days; dry fed skim milk to 90 days	25	212.4	65.06
Whole milk to 30 days; gruel to 90 days	18	204.7	54.39

*These experiments were conducted by W. Ebert, then Animal Husbandman at the Matanuska Experiment Station.

**All rations were supplemented by grain, and codliver oil was added to all except the whole milk ration.

†Prices used in calculating costs in this table and in table 2 are as follows:

Whole milk	cwt.	\$10.00	Hay	ton	\$45.00
Fresh skim milk	cwt.	4.00	Silage	ton	15.00
Skim milk powder	cwt.	15.00	Calf meal	cwt.	11.25
Grain	cwt.	6.50	Calf manna	cwt.	11.25
Codliver oil	gal.	4.35	Milk-flo	cwt.	6.50



Powdered skim-milk-fed calf aged 3 months. Weight 160 pounds.

were thoroughly mixed. Then 1 pound was blended with 9 pounds of water. Codliver oil supplemented this gruel, providing the necessary source of vitamins A and D. This gruel diet was gradually replaced with the basic grain mixture at 90 days of age.

At the end of 6 months, these calves were compared as to gains and costs, which are listed in table 1. Here you may easily see that the whole milk and skim milk calves made the best gains. They were expensive to raise, although part of the cost might have been saved if we had stopped feeding milk earlier. Considering weight gains, powdered skim milk in water was just as good as fresh skim milk, and was far cheaper to feed. Skim milk powder fed dry was no more economical than feeding it mixed with water because the dry-fed calves had to have whole milk longer. Gruel was a cheap feed, but it was not as satisfactory from the standpoint of weight gains as powdered skim milk. Also, whole milk had to be fed until calves could be changed to gruel at about 30 days of age.

Several prepared calf feeds have appeared on the market in recent years. Two of these, called "Calf Manna" and "Calf Meal" have been compared experimentally with both powdered skim milk and a dairy concentrate called "Milk-Flo." The results of these comparisons are shown in table 2.

Calf-Manna and Milk-Flo proved to be excellent feeds. Calves liked both of these preparations and made good gains. In using these commercial feeds, the calves were tapered off whole milk within about 40 days. Some calves require whole milk longer than others.

TABLE 2. *Weight gains and costs of raising calves to 6 months on four different starting rations fed for the first 60 days. Matanuska and Fairbanks Experiment Stations, 1948-1950.*

Starting ration	Number of calves	Average weight at—			Average Gains		Cost per calf*
		Birth	90 Days	150 Days	180 Days	Total	
		Pounds			Pounds		
Whole milk and Milk-Flo	8	79	165	282	323	245 1.36	\$62.00
Whole milk and Calf Manna	10	77	172	287	327	249 1.39	61.35
Whole milk and Calf Meal	9	81	172	259	310	229 1.27	56.95
Skim milk powder in water	8	74	149	264	323	249 1.38	44.34

*For prices, see footnote under table 1.

Vigorous Dane and Holstein calves can sometimes get along without milk after 30 days, although it is usually safer to include milk in their diets a while longer. Calf-Manna and Milk-Flo were fed dry just as soon as the calves would take it, usually within a week after birth. Whole oats were fed with Calf-Manna, each calf receiving no more than 1 pound of the Calf-Manna and 2 pounds of oats per day. Calves receiving Milk-Flo were allowed up to 3 pounds daily, but no whole oats were added.

At about 2 weeks of age, these calves were started on roughage. First-class oat-pea or grass hay was fed at first. Some calves were fed good silage after they were 3 months old. Others, born a little later, were pastured after 90 days of age. The experiment was designed in such a manner that the kind of roughage made no difference in the comparisons shown in table 2.

The cost of raising calves on these two starting rations is determined largely by the amount of whole milk that has to be fed. By getting the calves off whole milk as soon as possible and limiting Calf-Manna to 1 pound a day the cost on this ration can be kept down. Milk-Flo is a commercial dairy ration and therefore is much cheaper than Calf-Manna.

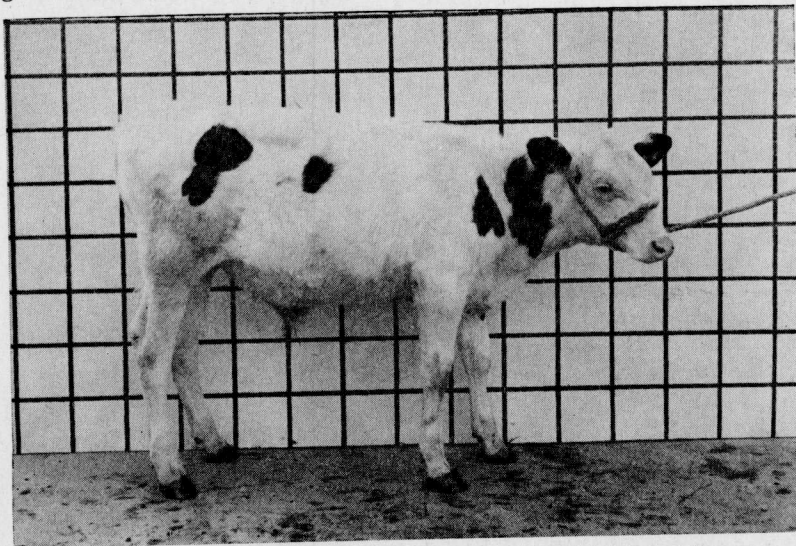
Calf Meal was fed as a gruel, 1 pound being mixed with 8 pounds of warm water. Some calves refused to take this gruel unless milk was added. Most calves required fresh milk for a longer time than when powdered skim milk was fed as described below. Grain and roughage were fed the same way as with powdered skim milk. One problem encountered with this ration was a marked tendency towards scours.

Powdered skim milk proved to be the cheapest and one of the most satisfactory starting feeds. One pound was mixed with 8 pounds of warm water (95° to 100° F.). Calves were started on this liquid when their mothers' colostrum milk was gone, usually

about 4 days after birth. Not more than 8 pounds of powdered milk mix were given each calf every day. As the calves grew bigger, they had to eat more grain and hay rather than more milk. In this diet, a mixture of equal parts of ground oats, barley, wheat and soy bean meal was fed instead of whole oats. Each calf was also fed 1 tablespoonful of codliver oil as long as it received powdered skim milk. Skim milk was withdrawn from the diet when the calves were 2 months old. Because these calves did not consume saleable milk, they were much cheaper to raise. Although they made slow gains up to 4 months of age and looked rough, they gained rapidly during the last 2 months. When 6 months old, they were as large and well-developed as other calves that had consumed whole milk.

Raising calves on powdered skim milk requires considerable skill to avoid scours. Calves on a powdered skim milk diet are susceptible to scours. They must be watched closely. At the first sign of scours, give 2 to 4 grams ($1/4$ to $1/2$ teaspoonful) per day of sulfaguanidine until the condition is checked.

These experiments answer several important questions. First of all, calves can be raised without whole milk after the first 3 days. The best and cheapest milk substitute is powdered skim milk which can be bought for about 15 to 25 cents a pound. Calf meal is another good substitute.



Powdered skim-milk-fed calf aged 4 months. Weight 212 pounds.

Follow a Recommended Feeding Program-

If you feed powdered skim milk, the following suggestions based on research experience will be helpful. Homesteaders with little or

no experience in calf raising will improve their chances of raising a good heifer by studying and rigorously following this program. Experienced dairymen may have good reasons for deviating from some of these points. In general, however, these rules will apply to most calf raisers.

1. Feed mother's colostrum milk while it lasts, at the rate of 6 pounds a day to a small calf and 8 pounds per day to a large calf.

2. Change to powdered skim milk gradually so the calf is on skim milk entirely by the time its mother's colostrum milk is gone. If this is not possible, start on skim milk when the calf is removed from its mother. *Thoroughly* mix 1 pound skim milk powder to 8 or 9 pounds of warm (95°-100° F.) water. Limit the amount of skim milk to 6 to 8 pounds per day according to the size of the calf. Mix 1 to 2 tablespoonfuls of codliver oil per day in the dissolved skim milk.

3. Encourage the week-old calf to eat grain by putting some in its mouth and in the bottom of the pail when the milk is gone. Whole oats are good for young, skim-milk-fed calves.

4. After the calf is a week or 10 days old, keep good quality hay in front of it at all times. Clean out old hay and put in fresh every day.

5. If whole oats are fed with skim milk in the starting diet, gradually change to a grain mixture supplemented with soy bean meal when the milk is removed. A good mixture is made of equal parts of ground oats, ground barley, ground wheat and soybean meal with 1 percent salt and 1 percent bone meal. This mixture may be substituted for whole oats from the beginning.

6. Discontinue skim milk at 60 days of age. After a calf is this old, it should be eating only the grain mixture and roughage.

7. Don't feed your calves more than 3 pounds of grain or grain mixture per day. Make them eat roughage rather than grain.

8. Provide clean water where it is always available to the calves. Offer coarse salt in a box.