

feeding of a little at a time every day is far better than feeding a quantity twice only. Never give more than two quarts at a feed to a young calf. A good way of ascertaining whether a

calves to skim milk that its milk ration should consist entirely of it. As soon as the animal shows a disposition to nibble at food put a few whole or ground oats in its manger, and it is

a pound when the animal is six months old.

Other Substitutes.

An English dairy farmer who has evidently some new milk to spare gives the following as his method of feeding calves: He makes a porridge of four quarts of corn meal, two quarts of ground buckwheat, four quarts of wheat bran, and two handfuls of linseed meal. Each calf receives a heaping tablespoonful for each meal, which is made into a porridge with water and added to one quart of sweet milk in which a pinch of salt is put. The grain is gradually increased each week. As regards this ration it may be said that skim-milk could well be substituted as more economical than new milk, and also that the feeding of corn meal and ground buckwheat would have a tendency to induce flesh forming habits in the animal. The Iowa Experiment Station, it is true, has had better success with corn meal than with linseed meal as a fat substitute, but its experiment was more in the line of animals destined for feeding purposes than for dairy use. Good results have, however, been obtained by the following mixture in which corn meal has a share: skim-milk, twenty pounds per day, corn meal 1.5 pounds, flax seed one ounce. This ration is for a calf that has had a good start, beginning with twelve to sixteen pounds of skim-milk per day in which one-quarter to one-half pound of ground linseed has been mixed.

Some breeders use an oatmeal porridge composed of two pints of oatmeal and one-half pint of linseed meal boiled with sufficient water to make it of the right consistency. This, when stirred in with skim milk, constitutes a feed for a calf for one day. As stated above, care must be taken when the calf is young to remove all oat husks from the meal before it is boiled. Then there are the various calf meals which can be used in connection with skim-milk, but as these will be discussed further on, no more need be said of them just here. Alternate substitutes for oil meal are gluten meal and even boiled mashed potatoes, which have been advantageously used in some instances, although their composition would not lead one to think that they would be of much value in calf feeding.

As the calf grows, the substitutes for fat in the skim-milk are to be increased from time to time, but not beyond a certain extent. The increases should rather be made in the dry grain ration fed in addition to the skim-milk and mixture as soon as the calf will eat it. For the ration of grain fed dry there is nothing better than ground oats and bran, which furnish material to build up the frame of the growing calf. When the milk ration is entirely dropped, which will be at any time when the animal is from three to six months, according to the supply available, the linseed meal



Five Shorthorn Grade Calves under seven months, reared for the first fourteen days on Skim-Milk afterwards on Calf-meal Gruel.

calf has had enough is to watch its sides, and when they are flush with its shoulders and hips remove the pail. Small calves, such as Jerseys, require less than larger ones. Another important point is to watch when whole milk is being fed that the mother's milk is not too rich for the young calf, because milk that tests high in butterfat will be very liable to upset the young animal's digestive organs. At the end of the first or second week commence gradually to substitute skim-milk for part of the new milk, the amount changed varying according to the disposition of the calf. Some will resent the change, others will not. Be careful to have the milk warmed to from 90 degrees to 98 degrees, but not exceeding 100 degrees F. A simple way to bring it to this temperature is to place the vessel containing the milk in hot water. All risk of burning and boiling is thus obviated. When the milk is separated directly after milking it will be warm enough to feed without heating if given to the calves at once. To prevent calves drinking too fast, a practice which sometimes causes scouring, it is an excellent plan to add a few bread crumbs or small pieces of stale bread to the milk. Too much stress cannot be laid on the absolute necessity of cleanliness in the vessels and pails in which the milk is heated and fed to the calf. A little of the previous meal's milk left in the crevices or on the sides of the pails will soon cause an enormous increase of the bacteria that sour the milk, and the consequence will be derangement of the digestive organs and a calf "off its feed." At the end of a week after the gradual change from whole milk has begun the calf should be so accus-

surprising to see how quickly it will learn to eat them. The manger must be watched, however, and the uneaten grain removed before it becomes sour. A little good clover hay should now be provided.

Substitutes for Butter Fat in Whole Milk.

When the change to skim-milk is made it becomes necessary to add something to the ration to make up for the butter fat previously fed in the whole milk. For calves intended for the dairy there is no better substitute than flax seed or linseed meal. To prepare the former take a quart of it, let it soak for six hours in from six to eight quarts of water, then boil it for an hour. It will then be in the form of a jelly. Give the calf one-half teacup full at a meal in the warmed milk and gradually increase the jelly as the calf grows. Do not feed too much at a time because it is a laxative, and heavy feeding of it also tends to the formation of too much flesh. If desired, the flax seed can be added to the milk while being boiled, before it forms into a jelly. The addition of a little salt to the flax seed when boiling acts as an aid to digestion. When linseed meal is used, take equal parts by weight of linseed meal, fine oatmeal that has been run through a sieve to remove the hulls, and wheat bran mixed, about one-half pound for each calf. Stir this in water and boil slowly for one-half hour, then add it to the skim-milk, keeping the mess stirred while feeding. Some feed jelly for one or two months then change to linseed meal, feeding it dry with ground oats, using four to eight ounces a day of the linseed meal and increasing it to