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Raising The Dairy Heifer

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Calves raised on Skim-milk at the Kentucky Agricultural Experiment Station.

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Investigations indicate that it costs approximately $120 to raise a dairy heifer to the age of two years. Of the total cost, about 70 per cent is for grain, most of which is fed to the calf during the first year of its life. According to recent reports there are about 444,000 dairy cows on farms in Kentucky. The average period of usefulness of the milk cow is probably not more than six years. This means that the total number of cows in Kentucky must be replaced every six years, or, in other words, 74,000 heifers must come into milk each year in order to maintain the number of cows. If a farmer has twelve cows he must have at least two heifers to become fresh each year, and must have on hand four heifers that have not begun to yield returns. Estimating the cost of feed alone it means that there are approximately $8,880,000 invested in unproductive dairy calves and heifers. But, regardless of cost, the dairy herds must be maintained and these heifers must be reared. One matter that chiefly concerns dairymen is how to raise the heifer most economically.

One of the chief problems in dairying is to obtain good cows. It is becoming more difficult each year to secure the right kind of dairy stock. This fact indicates that the most economical way to build up a good herd is to raise the heifers from the best cows, being careful to have the calves sired by a pure-bred dairy bull. Raising heifers to replenish the breed serves to protect the herd against the importation of such

diseases as tuberculosis and contagious abortion, which are often introduced by new animals. Many dairymen in Kentucky are not raising the heifers (even the best ones) but are selling all for veal, depending upon the stock yards or open market for cows as needed. Good cows, the kind that every farmer wants, are for sale only at high prices. Ordinarily, undesirable cows are the only ones found on the open market. Whenever the practis of buying new cows instead of raising heifers is followed, the production of the herd is usually low and there is little opportunity or tendency for it to rise. The practis marks the distinction between a dealer and a breeder.

In general, the problem of feeding the calf must be considered from two standpoints; first, when whole milk is sold from the farm, and skim-milk is therefore not available; second, when cream is sold and skim-milk is available for feeding to the calves.

WHEN WHOLE MILK IS SOLD.

Almost 50 per cent of the dairy cows in this country are found on farms from which whole milk is shipped to city milk dealers, condenseries and cheese factories. The milk brings a high price, and calves can not be fed economically on it for a great length of time. Until four months of age a calf requires 8 to 12 pounds of whole milk daily. This makes a total of about 1,200 pounds of whole milk for the four months. Valued at $3.50 a hundred, the milk is worth $42. This does not take into consideration the hay and grain that the calf consumes during this period. Because of the value of the milk required to raise calves, dairymen often follow the practis of killing all bull calves, and sometimes the best heifers are sacrificed in this way.

In general, one of three plans may be followed by the farmer who has a market for whole milk. The plans are outlined as follows:

1. Give the calf a good start on whole milk and at the end of two months put the calf on a hay and grain ration. Experi-

ments have recently been completed at the Missouri Experiment Station,* determining the earliest age at which calves of the different dairy breeds may be taken off of milk and still continue to grow normally. One group of calves was weaned at five months, another at four months, a third group at three months and a fourth group at two months. Both before and after weaning, the calves were weighed and measured and the figures compared with the normal measurements of the respective breeds at different ages. Success was obtained in withdrawing the milk with Jerseys and Holsteins at five months, at four months and at three months, while practically normal gains were secured in almost every case when the calves were fed skim-milk for only sixty days. They were taught to eat grain and a good quality of legume hay while receiving the milk.

For the first two weeks after birth a small calf should get from 8 to 10 pounds or 4 to 5 quarts of whole milk daily, in two or three feedings; a large calf may be given 10 to 12 pounds a day. When the calf is two weeks old it can be gradually changed from whole milk to skim-milk gradually substituting an equal amount of the latter, assuming, of course, that a limited amount of skim-milk can be secured. A complete substitution can be effected in about ten days. At the end of two months a medium sized calf should be receiving around 12 pounds of skim-milk daily.

Until two months of age the calf should receive 10 to 12 pounds of skim-milk a day. During this period it should be taught to eat hay and grain. At the end of two months the milk can be gradually reduced and grain substituted until the calf is fed only grain and hay. Two grain mixtures that have proved successful are as follows: Mixture No. 1 consists of 4 parts by weight of corn chop, 1 part wheat bran and 1 part linseed meal. Mixture No. 2 is the same except blood meal takes the place of one-half the oil meal. A good quality of alfalfa or clover hay should be supplied.

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*Swett, W W. Raising calves on farms where whole milk is sold. Missouri Experiment Station Circular 88, 1919.

2. A second plan of feeding, where whole milk is not available, is to give the calves whole milk for two weeks and then change to a ration of calf gruel or milk substitute. While a fair degree of success has resulted from the feeding of these milk substitutes, no mixture has as yet been developed that will satisfactorily take the place of milk

There are a number of so-called milk substitutes on the market, most of which are sold as calf meals With proper care a fair degree of success may be had with these substitutes. It must be borne in mind, however,that calves receiving these meals will not be as sleek and fat as those raised on milk. These meals can be bought ready mixed or can be prepared at home if the proper ingredients can be secured. As a rule the home mixed meals are cheaper and are often superior to the ones bought on the market. Some of the commonly used materials composing these meals are: fine corn meal, flour middlings, poor grade of wheat flour, ground rice, linseed meal, flax seed meal, blood flour, and dried skim-milk or skim-milk powder. Skim-milk powder is not essential and it is expensive. However, the most sucessful calf meals contain a considerable amount of it. One of the most practical and successful home made mixtures, known as the Purdue Mixture, was developed by the Indiana Experiment Station.* It is composed of equal parts (by weight) of hominy feed, linseed meal, red dog flour and dried blood. These constituents can be purchased at a reasonable price and mixed at home. Another mixture used successfully at the Indiana Station consists of 8 parts corn meal, 3 parts dried blood and 1 part oil meal.

As a general rule, one pound of the dry calf mixture will substitute for 9 or 10 pounds (4½ quarts) of skim-milk. This meal is made into gruel or thick paste by adding a small quantity of cold water. The lumps should be crushed and stirred out, after which boiling water is added, about 4½ quarts for

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* Hunziker, O. F. and Caldwell, R. E. Skim-milk and milk substitutes for calf feeding. Indiana Experiment Station Bulletin 193, 1916.

every pound of meal used. This gruel is substituted for skim-milk, pound for pound.

As was stated before, calves will not do as well on milk substitutes as on whole or skim milk. However, they will be of same height and in a thrifty and growing condition if fed properly. Milk is better and at an equal cost would be preferred. Calf meals are used only when the high price of milk prohibits its use.

3. A third manner of feeding, where whole milk is sold from the farm, consists in giving the calf the least amount of milk required to promote normal growth. The Illinois Experiment Station† found that the minimum amount is 152 pounds of whole milk and 435 pounds of skim-milk. This was fed during a period of two months, after which the calf was gradually put on a hay and grain ration.

WHEN SKIM-MILK IS AVAILABLE

If cream is sold from the farm and skim-milk is thus made available, the problem of feeding the calf is not so difficult. Good calves can be raised on skim-milk.

The earlier the calf is taken from the cow the easier it can be taught to drink from a bucket. Some dairymen never allow the calf to nurse at all, while others allow the calf to stay with the cow for the first few days. The very young calf should be fed frequently and in small quantities. Its stomach at this time is small and excessive amounts of milk will result in indigestion and scours. The first milk of a cow after calving is called colostrum, and is valuable for the calf because it is a laxative and cleans out the digestive system. For the first two weeks, 8 pounds of milk a day is all the calf should be allowed. A small calf, such as a Jersey, should not have more than 6 pounds a day at the start. It may be fed twice a day but three times is preferable. As the calf grows older, the milk can be slightly increased, but at no time will it need more than 14 or 15

† Fraser, W. J. and Brand, R. E. Milk Required to Raise a Dairy Calf. Illinois Experiment Station Bulletin 164, 1913.

pounds a day. Overfeeding is a frequent cause of digestive troubles. A good rule to follow is always to keep the calf a little hungry. Calves should never be fed in troughs, as is commonly done. Some calves drink faster than others and if fed together some will overfeed while others will not get enough.

At the end of two weeks the calf can be changed to skim-milk. This must be done gradually, taking about ten days for the complete change, replacing the whole milk with an equal quantity of skim-milk. An important consideration is to have the milk warm and sweet when fed. Nothing will upset the digestive system of a calf more quickly than to give it cold milk when it is accustomed to warm milk.

After the calf is three or four months old it may gradually take cooler milk, in which case the milk should be fed cool all the time. However, best results are obtained at all ages with warm milk. When drawn from the cow, milk is at a temperature of about 100 degrees F. If separated immediately and fed without additional warming it will be around 90 degrees F. If the weather is cold the milk should be warmed. It is better for a calf to miss a feed than for it to be fed sour milk. Pails and utensils must be kept scrupulously clean. A skim-milk calf should be taught at an early age to eat grain. Many will begin eating grain at two weeks old. It should be placed in a box where the calves can easily get it. They can be encouraged to eat at first by placing a little grain in their mouths. Another good plan is to sprinkle some grain in the bottom of their milk pail after they have finished drinking. Never feed the grain with the milk because the calf will gulp it down without chewing. Grain should not be kept before the calf all the time—give it what it will consume twice a day. Up to the age of two months it should have a little more. A pound of grain a day will keep it in good growing condition.

The grain is to take the place of the fat which was removed from the milk in skimming. Equal parts of corn meal and whole or crushed oats make a good grain mixture to supplement

skim-milk. Corn meal should be fed the young calf until it is two or three months of age, when shelled corn can be gradually substituted for it. The essential points to be kept in mind are as follows:

Feed fresh, sweet milk—Feed regularly—Do not over feed,
Feed warm milk—Feed each calf individually—Keep the pails clean and sweet.

WINTER RATIONS FOR DAIRY HEIFERS

The proper method of feeding dairy cows has been studied by various investigators and the feeding of calves on milk and milk substitutes has been the basis for considerable study, but there is comparatively little information available regarding the proper kind and amount of feed for the heifer from the time she is weaned until she freshens or becomes a cow. The results of investigations at the Missouri Experiment Station* which include data on seventy-six heifers, briefly summarized, emphasize the following facts: Heifers should be raised largely on roughage. However, grain feeding should be continued for some time after the heifer is taken off of milk, because stopping the milk and grain at the same time requires too great a consumption of roughage. The animal will not eat a sufficient amount of roughage for some time, even on good pasture, consequently growth will be slow for a few months.

From about ten months of age the heifer should be fed on good roughage until within two or three months of calving, when some grain should be fed. This plan may result, in some cases, in the heifer being somewhat under normal size during the growing period. If this condition is evident it should be offset by not breeding the heifer until later than usual. The amount of grain that can be fed economically depends almost wholly upon the character of the roughage. If palatable roughage, such as corn silage and legume hay is available, satisfactory results can be obtained with a minimum amount of grain.

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*Eckles, C. H. Winter Rations for Dairy Heifers. Missouri Experiment Station Bulletin 158, 1918.

Heifers that have made gains far above normal during the winter, as the result of heavy grain feeding, make small gains during the summer on pasture. Heifers making considerably less than normal gains during the winter, as a result of rations received, make relatively larger gains on pasture in summer. However, if winter conditions are too extreme, so that the animals are low in vitality in the spring, the summer gains on pasture will not be sufficient to make up for the small gains made during the winter. The best results follow a winter ration that enables the animal to make a normal growth. It means keeping the animals in moderate flesh. Silage and a legume hay, both fed at will, make one of the most practical and economical rations and give larger gains than alfalfa or other legumes fed alone. On this ration heifers nine months or more of age make normal growth during the winter. Calves younger than this need some grain in addition. When silage and legume hay are fed at will the animals will consume about two pounds of silage to one pound of hay.

The most satisfactory ration of all those tried was silage at will, legume hay limited to six pounds daily and two pounds of corn daily. On this ration heifers of all ages thrived and made gains a little above normal. Fair results can be obtained from feeding silage alone as a roughage. In this case, about two pounds of grain should be supplied daily, composed of equal parts of corn and linseed or cotton seed meal. The animals will be more contented and will do better if they have access to some dry feed, such as corn fodder or oat straw.

If silage is not to be had, legume hay fed at will, with two or three pounds of corn or other grain, makes a satisfactory ration for heifers of any age from six months to within a few weeks of freshening.

SOME PRACTICAL WINTER RATIONS.

1. When silage and legume hay are on hand or can be purchased at reasonable cost, the following ration is recommended: Corn silage and alfalfa, clover, cowpea or soy-bean hay at will.

To heifers less than ten months old give two pounds of grain daily in addition. If corn is high in price a mixture of other grains can be substituted if the cost a pound is less. For heifers within three months of calving, from two to five pounds of grain should be fed daily. The object here is to have them in fair flesh at calving time.

2. When corn silage is available but legume hay is not, silage can be fed as roughage together with some dry hay or fodder. About three pounds of grain should be fed daily, one-half of which should be a high-protein feed such as cottonseed or linseed meal. The remaining half may be corn, bran, crushed oats, or crushed barley.

3. If legume hay but no silage is on hand, a good ration is alfalfa, clover, soy-bean or cowpea hay fed at will, with two pounds of corn daily.

4. If corn fodder or timothy hay is on hand, but no silage or legume hay, it is usually best to purchase legume hay. If legume hay can not be purchased more grain must be fed. Under these conditions feed hay and fodder at will with five pounds of a grain mixture composed of one part corn, one part bran and one part cottonseed, linseed or gluten meal.