FEED AND CARE OF THE DAIRY CALF

BY R. S. HULCE, ASSOCIATE IN MILK PRODUCTION, AND
W. B. NEVENS, ASSISTANT IN DAIRY HUSBANDRY

Young animals are very responsive to the treatment they receive. It is the purpose of this publication to present methods of feeding and care which have been found by experience to give good results in rearing dairy calves.

SEASON FOR RAISING THE CALF

The time of year during which most of the calves will be born is governed by such factors as: the seasonal market demand for milk; the time when feed is most cheaply obtained; and the season when labor is available. There are several points in favor of starting the animal in the fall or early winter. At this season of the year there is usually an available supply of help which makes it possible to take the time necessary to properly care for the young calf. During the winter, as the calf develops, it will learn to take grain and hay, and by early summer will be ready to make some use of pasture.

BIRTH QUARTERS FOR CALF

A dry, warm, well-ventilated box stall should be provided for receiving the calf at birth. A great many of the physical troubles to which calves are subject are caused by cold drafts and dampness. Even if the quarters are warm, if they are ill-ventilated or moist, the animal’s vitality is lowered and its resistance to cold and disease lessened. An abundance of dry bedding helps to keep the calf dry and warm.

BIRTH WEIGHTS OF CALVES

The approximate birth weights of calves should be known, since these weights serve as a guide in apportioning milk to young calves. The weights of calves at birth depend largely upon breed, Holstein and Ayrshire calves weighing more than Guernseys and Jerseys. Sex is also a factor, as males usually weigh more than females of the same breed. Heredity and the age, size, and physical condition of dam also influence the weights of calves at birth.

The average weights at one day of age of dairy calves born in the University dairy herds have been classified according to breed and sex in the following table:
FEED AND CARE OF THE DAIRY CALF

WEIGHTS OF DAIRY CALVES AT ONE DAY OF AGE

<table>
<thead>
<tr>
<th>Breed</th>
<th>Jersey</th>
<th>Guernsey</th>
<th>Ayrshire</th>
<th>Holstein</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Female</td>
<td>Female</td>
<td>Female</td>
<td>Female</td>
</tr>
<tr>
<td>Av. weight</td>
<td>59.7</td>
<td>68.8</td>
<td>71.4</td>
<td>88.0</td>
</tr>
<tr>
<td>Male</td>
<td>62.4</td>
<td>70.0</td>
<td>77.7</td>
<td>90.0</td>
</tr>
</tbody>
</table>

SEPARATING THE CALF FROM THE COW

It is well to allow the calf to remain with the dam for a day or two in order that it may receive the colostrum, or first milk. Colostrum milk has a purgative effect which aids in clearing out the calf’s digestive system. If the mother’s milk is very rich, it may be necessary to feed milk with a lower percentage of butter fat.

It is somewhat easier to teach young calves to drink than it is to teach older ones, but in either case it is necessary for the calf to become hungry by the omission of one or more feeds before it will drink milk from a pail.

One method of teaching the calf to drink is to get it to suck the attendant’s finger as its mouth comes in contact with the milk in the pail. The finger can be withdrawn gradually, and the calf will usually continue to take in the milk. Patience, rather than force, is a prerequisite on the part of the feeder.

IMPORTANT OF MEASURING THE MILK

Guess work in apportioning milk to the dairy calf is expensive both from the fact that irregular amounts often cause digestive troubles and because more milk than necessary is frequently fed. The milk can be measured into the bucket by the use of a container of known volume, it being understood that a gallon of whole milk weighs about eight and one-half pounds; or the milk may be apportioned by the use of a spring balance scale. The latter method has been used for several years in apportioning milk to calves at the University dairy barns.

FREQUENCY OF FEEDING

The importance of feeding the calf regularly cannot be overemphasized. The digestive capacity of the young calf is not suited to receive large quantities of milk at a time, but is better adapted for receiving small amounts often. A young calf fed milk three times daily will thrive better than if fed the same total amount in two feeds, providing the milk is always fed in a uniform condition.

AMOUNT OF WHOLE MILK FOR THE YOUNG CALF

A general guide for using whole milk is to feed it at the rate of one pound daily to each eight pounds of live weight, rarely feeding
more than twelve pounds per day. The length of the time whole milk should be fed will depend quite largely on whether skim milk is available.

WHOLE MILK AND ITS SUPPLEMENTS

Raising the dairy calf on whole milk alone is too expensive. There are a number of supplements which may be combined with whole milk in order to lower the cost of the ration. The feeds most commonly used as whole-milk supplements are skim milk, home-mixed meals, commercial calf meals, and hay and grain.

COMBINING WHOLE AND SKIM MILK

On farms where skim milk is available, it may be substituted for whole milk in the ration of a healthy calf when the animal is three or four weeks of age, a few days being necessary to complete the change. If the skim milk is fed in a warm, sweet condition, ordinarily
no difficulties will be experienced. The amount of skim milk fed may be increased as the calf increases in size, but it is rarely necessary to feed more than fifteen pounds daily, provided grain and a good quality of legume hay is being used. Where the supply of skim milk will permit, it is advisable to continue its use until the animal is five or six months of age in the case of grades, and for a longer period in the case of pure-breds. Skim milk is one of the most economical feeds known for producing growth in calves.

The following table outlines a schedule for feeding whole and skim milk.

**Suggested Calf Feeding Schedule, Using Whole and Skim Milk**

(Pounds of milk per day)

<table>
<thead>
<tr>
<th>Days of age</th>
<th>Whole milk</th>
<th>Skim milk</th>
<th>Whole milk</th>
<th>Skim milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>With dam</td>
<td>. . . . .</td>
<td>With dam</td>
<td>. . . . .</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>. . . . .</td>
<td>6</td>
<td>. . . . .</td>
</tr>
<tr>
<td>3 to 28</td>
<td>6 to 8</td>
<td>. . . . .</td>
<td>10 to 12</td>
<td>. . . . .</td>
</tr>
<tr>
<td>28 to 35</td>
<td>3 to 4</td>
<td>3 to 4</td>
<td>5 to 6</td>
<td>5 to 6</td>
</tr>
<tr>
<td>35 to 56</td>
<td>8 to 10</td>
<td>. . . . .</td>
<td>. . . . .</td>
<td>10 to 12</td>
</tr>
<tr>
<td>56 to 91</td>
<td>10 to 12</td>
<td>. . . . .</td>
<td>. . . . .</td>
<td>12</td>
</tr>
</tbody>
</table>

If plenty of skim milk is available, it can be fed to good advantage at the rate of about 15 pounds daily, instead of 12, to calves of the larger breeds, as indicated in the above table.
Precautions in Using Factory Skim Milk.—The use of factory skim milk has several disadvantages as compared with fresh, farm-separated milk. If the milk is pasteurized at the factory, it may be too warm to feed when it reaches the farm in the forenoon, and at night it will need warming. In summer there may be times when the factory skim milk will sour during the day, so that it is difficult to keep the milk in a uniform condition for calf feeding. In the feeding of calves, sudden changes either in quality or quantity of feed are to be avoided if the best use is to be made of the feed.

Diseases such as tuberculosis and foot-and-mouth disease may be carried by skim milk unless it is thoroly pasteurized at the factory.

Home-Mixed Milk Supplements

It is necessary, in using a milk supplement other than skim milk, to feed a considerable amount of whole milk. The amount of milk required is about a pound daily for every eight pounds of live weight, until the animal is four or five weeks old. At that age a milk supplement may be substituted gradually for the milk. Such a supplement may be prepared as a gruel mixture made up of equal parts of oil meal, blood meal, hominy and flour. The gruel is made by pouring hot water over the meal while it is stirred vigorously, after which it is allowed to stand before being used. The gruel may be fed at such a rate that the animal receives the equivalent of one-fourth pound of dry meal daily at the beginning, the amount being increased about one-
fourth of a pound daily each week for four weeks. As a rule, the use of milk should be continued until the calf is at least sixty days of age. At two months of age the calf will have received about 400 pounds of whole milk in addition to the milk supplement.

**Commercial Calf Meals**

The calf meals sold on the market are useful as supplements to whole milk, but as yet they have not been so compounded that they will successfully replace whole milk before the calf is several weeks old. Calf meals alone, or calf meals, grain, and hay do not form a complete ration for the young calf, since they do not supply the necessary nutrients in a form readily digested and assimilated. To produce satisfactory growth of the young calf when fed a calf meal, it is best to use the meal as a supplement to milk rather than as a complete substitute for it. It is doubtful if, under average conditions, good gains will be made unless some milk is fed until the calf is about sixty days of age. In most cases the manufacturers of calf meals claim more than is warranted for their products as substitutes for milk.

**Whole Milk and Hay and Grain at Will**

At the University of Illinois dairy calves of the larger breeds have made satisfactory gains on a milk schedule totaling 400 pounds of whole milk, when they had access at will to grain and a legume hay. This is the minimum amount of milk that should be fed; some individuals which do not eat grain and hay well at an early age may require more milk. The calves may be fed eight to ten pounds of whole milk daily for the first month, after which the amount may be reduced at the rate of two pounds per day at the beginning of each week.

**Grain**

The calf may be encouraged to eat grain at an early age if a small amount is sifted into the pail after the milk has been drunk, or if a fresh supply is kept in a box which is readily accessible. There is often a tendency not to feed grain at as early an age as the calf will eat it. Most calves will begin to nibble it when they are two or three weeks old, and it has been observed that the young calf having access to several different kinds of grain at first prefers such soft feeds as wheat bran and oil meal, but as it becomes older it will eat some of the coarser feeds such as oats and cracked corn in addition and in some instances in preference to the soft feeds.

A mixture of ground corn 10 parts, by weight, oats 50 parts, wheat bran 30 parts, and oil meal 10 parts, is suitable for the young calf; or these same feeds may be mixed in equal parts, by weight.
A good growing calf at three months of age will consume two to three pounds of grain daily when fed twice a day, and usually more if allowed grain at will.

**HAY**

The calf will often nibble hay when a few days old, but will not consume it to any appreciable extent until about four weeks old. A good grade of clover makes an excellent hay for calves. Observation suggests that, in the case of young calves, it does not have the over-laxative tendency that alfalfa sometimes has, altho alfalfa seldom causes any difficulties provided other suitable feeds are being used. Legume hays make excellent roughages because they are palatable and contain a large amount of protein and calcium.

A fine grade of legume hay, such as clover or alfalfa, should be kept in a manger or rack so that the calf has access to it at all times. When the leaves have been nibbled off, the coarser portions may be fed to the mature animals.

**CORN SILAGE**

Corn silage may be introduced into the ration as soon as the calf will eat it. Silage will not be consumed to any extent until the calf is two months old. It is important that the silage be of good quality.

**WATER AND SALT**

Water should be supplied daily to calves over a month of age. In winter it is well to warm the water.

Salt should be furnished to the calf after it reaches the age of two to three months. It may be sprinkled in small amounts into the empty manger or may be placed in a box provided for that purpose.

**CALVES OFTEN NEGLECTED AFTER SKIM MILK AGE**

The problem of caring for the dairy calf is by no means solved by the end of the milk-feeding period. The animal should be kept gaining constantly from birth to maturity if good growth is to be expected. Calves are frequently well cared for up to four or five months of age and then given little attention. If good growth is to be secured, heifers under a year of age require grain in addition to hay or pasture.

Since the condition of the heifer at pasture is not so closely observed as when in the stall, the heifer beyond the milk-feeding period is more likely to be neglected during the summer when on pasture than during the winter months.
The fact that the fly season and a dried-up pasture are not conducive to growth is apt to go for a time unnoticed. It is essential that a grain trough be provided in the summer lot for the heifers under a year of age. The amount of grain fed in addition to pasture in summer or other feeds in winter should be sufficient to keep the animals in a good growing condition.

**AMOUNT OF FEED CONSUMED BY DAIRY HEIFERS FROM BIRTH TO ONE YEAR OF AGE**

A growing dairy heifer should gain at least a pound a day during the first three months and should average slightly more than this from birth to one year. In order to give an idea of the amount of feed consumed by heifers up to the time they are a year old, the following table is presented:

### Average Amount of Feed Consumed per Heifer (Pounds)

<table>
<thead>
<tr>
<th>Feed</th>
<th>Group I Holstein Heifers²</th>
<th>Group II Holstein Heifers²</th>
<th>Group III Jersey Heifers²</th>
<th>Group IV Jersey Heifers²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whole milk</td>
<td>244</td>
<td>499</td>
<td>465</td>
<td>342</td>
</tr>
<tr>
<td>Skim milk</td>
<td>860</td>
<td>2,786</td>
<td>2,928</td>
<td>3,165</td>
</tr>
<tr>
<td>Grain</td>
<td>1,107</td>
<td>658</td>
<td>597</td>
<td>547</td>
</tr>
<tr>
<td>Hay</td>
<td>1,067</td>
<td>768</td>
<td>799</td>
<td>857</td>
</tr>
<tr>
<td>Silage</td>
<td>1,669</td>
<td>586</td>
<td>468</td>
<td>353</td>
</tr>
<tr>
<td>Corn stover</td>
<td></td>
<td>28</td>
<td>40</td>
<td>36</td>
</tr>
<tr>
<td>Pasture (days)</td>
<td></td>
<td>128</td>
<td>122</td>
<td>123</td>
</tr>
</tbody>
</table>

### Weights and Gains of Heifers

<table>
<thead>
<tr>
<th></th>
<th>Group I</th>
<th>Group II</th>
<th>Group III</th>
<th>Group IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight at birth</td>
<td>92</td>
<td>82</td>
<td>56</td>
<td></td>
</tr>
<tr>
<td>Weight at 1 year</td>
<td>532</td>
<td>564</td>
<td>472</td>
<td></td>
</tr>
<tr>
<td>Average daily gain</td>
<td>1.2</td>
<td>1.3</td>
<td>1.1</td>
<td></td>
</tr>
</tbody>
</table>

¹Illinois Agricultural Experiment Station, unpublished data.

The amounts of milk fed Group I represent conditions where skim milk is not plentiful. Only by the use of a good grade of legume hay and more grain than indicated for the other lots were good gains made. The amount of grain could have been reduced by the use of more skim milk and some pasture, as indicated in the case of the other groups.

The reader, by applying his local prices to the amounts of feeds indicated in the table, can easily calculate the feed cost of raising a heifer to one year of age. With whole milk valued at $1.60 per 100 pounds, skim milk at $.30, grain at $1.25, hay at $.75, silage at $.20, and pasture at $.50 per month (stover, small amounts not figured),
the feed cost per heifer for Group I is found to be $31.66; Group II, $33.49; Group III, $31.94; Group IV, $30.45.

**RAISE OR BUY COWS?**

During the past five years the feed cost of raising a heifer to two years of age has probably been about $60, except where cheap pasture was available. The total cost of raising includes also the items of labor, housing, and miscellaneous expenses. In considering the latter items it is well to mention the fact that on the ordinary farm the additional labor expense which the raising of a few calves involves is not large. The expense involved in rearing dairy heifers to maturity makes it apparent that unless the animal is from ancestry the females of which are capable of producing product that will sell for more than the expense of producing it, the heifer should not be raised. On the other hand, the stockman who has a disease-free herd is assuming a risk of introducing disease when a new animal is purchased. Considerations such as these confront every owner of dairy cattle.

**Calf Quarters**

The calf should have dry, well-lighted quarters, preferably with a southern exposure. The fewer doors a calf barn has the more effectively can cold be excluded in winter. A rack or manger from
which hay may be eaten at will should be provided. Stanchions for fastening the animals at feeding time are desirable. If the calves are stanchioned while they are being fed milk and are given grain before being turned loose, there is not so much tendency for them to suck one another.

The ideal arrangement is to have small stabling pens for each calf. When calves are handled in numbers, it is desirable to group them according to size and to keep the groups small.

SCOURS

Scours is the most common calf ailment. It results from various causes, indigestion and exposure being the most common. Indigestion may be caused by a too liberal supply of milk, too rich milk, a sudden change in the character of the milk, or too large an amount of commercial calf meals.

Treatment.—The cause should be determined at once and removed. In all cases it is well to reduce the feed. If the cause is indigestion, it is recommended that one to two ounces of castor oil be administered. The oil effects the removal of irritating materials and later acts as an astringent.

Milk that has been scalded, raw eggs, and flour are home remedies which are more or less useful regulators. Half a tablespoonful of a mixture of two parts of subnitrate of bismuth and one part of salol may be given in the milk at feeding time or as a drench. The dose may be repeated at six-hour intervals until the scours are checked.

Effective remedies for scours and other calf ailments may be obtained from a veterinarian.

White Scours.—White scours is a violent and deadly form of diarrhea which attacks the new-born calf. The disease results from
infection by a specific germ. The most noticeable symptom that accompanies the disease is that of a profuse yellowish-white liquid bowel discharge. The calf becomes dull and weakened, and as a rule dies within a day or two. Very little can be done in the way of treatment, but preventive measures should be taken. If the barn is infected with white scours, especial care should be taken in disinfecting the box stall in which the cows calve, and in providing dry, clean bedding.

DISINFECTION OF THE CALF'S NAVAL

The navel of the calf is an avenue of infection. When infection of the navel takes place, the joints of the legs frequently swell and the calf usually dies within the course of a few days. Infection by way of the navel is very common in barns infected with white scours or contagious abortion.

To prevent infection of the navel of the new-born calf, several applications of tincture of iodine should be made.

LICE

Calves infested with lice do not thrive. Lice are difficult to get rid of when once the barn is infested. Washing the calf thoroly with a 2- to 5-percent coal-tar disinfectant such as zenoleum or creolin is effective. The washing should be repeated in a week in order to kill any lice that hatch in the interval. If the washing is done in cold weather, the calves should be thoroly rubbed with dry cloths and kept blanketed until dry.

DEHORNING

Caustic potash properly applied to the rudimentary horns of a calf a few days old will check their growth. Before using the caustic potash, clip the hair from the places to which it is to be applied. Rub the rudimentary horns with the caustic until the surfaces are red but not bleeding. Do not let the caustic come in contact with the calf's skin other than at the points to be treated.

Caustic potash can be purchased at any drug store, and comes in sticks which should not be handled with the bare hand.

SUCCESSFUL CALF RAISING DEPENDS ON THE CARETAKER

The person who actually feeds and cares for the calf must know what constitutes good care, and in addition must be able and willing to apply a considerable amount of observation and good judgment to the work if he is to be successful.