Special Bulletin 108 Revised July 1935

RAISING DAIRY CALVES ON SKIMMILK

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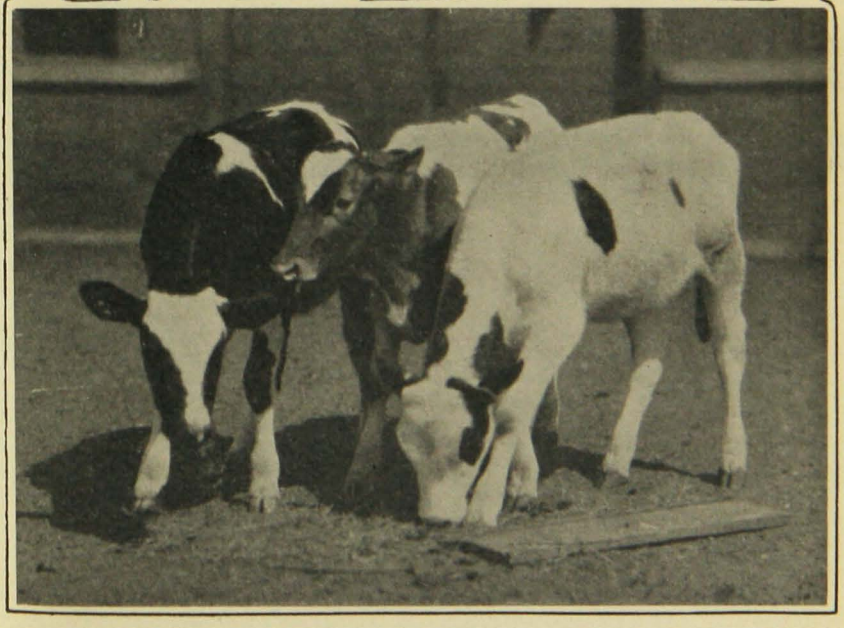

UNIVERSITY OF MINNESOTA
AGRICULTURAL EXTENSION DIVISION

Published in furtherance of Agricultural Extension, Acts of May 8 and June 30, 1914. W. C. Coffey, Acting Director, Agricultural Extension Division, Department of Agriculture, University of Minnesota, co-operating with United States Department of Agriculture. 10M-7-35

CALF raising is a part of dairy farming which is often much neglected. The large number of undersized, undernourished, "pot-bellied," and unthrifty calves to be seen in all parts of the country is convincing proof of this fact. This condition results largely from the fact that many dairy farmers do not realize how important calf raising is to the maintenance of a good dairy herd and consequently give little or no attention to the matter. The calf is the material from which every dairy herd is developed, and good cows can grow only from calves properly selected and raised.

Successful calf raising is a comparatively simple task on farms where cream is sold, as is the case on most dairy farms in Minnesota. Under these conditions there is always a supply of whole milk for feeding during the first few weeks after birth to insure giving the calf a good start. After this, with plenty of skimmilk and with good hay and grain available, all that is necessary to assure success is the observance of a few fundamental rules of health in the care and management of the calf.

HEALTHY CALF IS FIRST ESSENTIAL

The first essential in successful calf raising is to have a healthy animal. Unless a calf is very valuable from the standpoint of breeding, it will not pay to attempt to raise it if suffering from some ailment at birth. The size and vigor of the calf at birth should also be considered. While there is no definite relation between birth weight of the calf and mature weight of the cow, a calf large for the breed is to be preferred, because it usually is more vigorous than a smaller one and is consequently less difficult to raise. If, however, a small calf is vigorous and strong it should not be discarded because of lack of size alone, for strength and vigor at birth are more to be desired than size. Table 1 gives the average birth weight of calves of both sexes for the various dairy breeds.

Table 1. Birth Weight of Calves*

Breed	Males	Females	Average for both sexes
	lb.	lb.	lb.
Jersey	58	53	55
Guernsey	..	..	71
Ayrshire	73	65	72
Holstein	93	88	90
Brown Swiss	..	..	100
Dairy Shorthorn	74	73	73

* From Dairy Cattle and Milk Production, by C. H. Eckles, p. 237.

The breeding of the calf is very important. Too often this point is not considered. The fact that about a third of all the dairy cows in the United States are unprofitable as producers is largely due to the neglect on the part of dairymen properly to select the calves they raise. More attention should be given to selecting calves with the right kind of breeding. This matter can not be emphasized too strongly. Care and feed will make possible the development of an animal to its fullest extent, but ability to produce can not be secured in this way. Ability is a matter of breeding and is an inherited quality transmitted from the parents. The practice of selecting the heifer calves from the best cows in the herd is to be commended. This alone, however, will not assure good results, because the calf inherits characteristics from both parents, and therefore the qualifications of the sire must also be considered. Frequently the influence of the sire is the greater of the two. For this reason, it is desirable that every calf to be raised should have as good a mother as possible and be sired by a purebred sire whose pedigree or performance record indicates that he has the ability to transmit good production to his offspring.

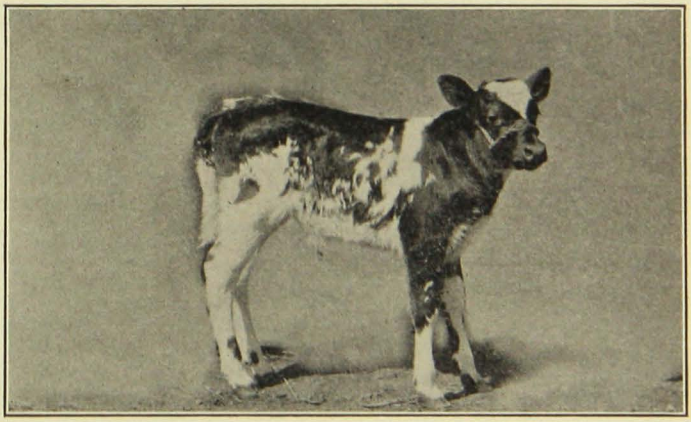

Fig. 1. A Healthy and Vigorous Calf

GOOD CARE AT BIRTH IS IMPORTANT

Most of the troubles in calf raising result from improper care and handling at birth and immediately following. A young calf, like the human infant, during the first weeks of its life is very sensitive to the treatment received. This is undoubtedly the most critical period. No definite rules can be given for caring for the calf during this time. Observance of the ordinary rules of health is about all that is necessary. A clean, warm, well-bedded box stall should be provided the cow in which to give birth to her calf. Immediately after birth care

should be taken to protect against the invasion of disease germs which frequently gain entrance at this time. A common avenue for the entrance of infection is through the navel cord, especially the infections causing white scours and joint ill. To guard against such invasions, the jelly-like substance in the cord should be pressed out with the fingers and thumb and the navel stump disinfected with a 20 per cent solution of tincture of iodine. This is done by dipping the end of the cord in the solution or by painting the cord with it.

The length of time the calf should remain with its mother depends on its condition at birth. From one to three days is generally recommended. A weak calf may need to be left longer, but one that is vigorous should be removed almost immediately after birth because of the danger that it will upset its digestive system if allowed all the milk it will take. However, it is very important in all cases that the calf receive the colostrum or "first milk" from its mother. Colostrum is nature's physic for the newborn calf. It contains substances which stimulate the action of the digestive tract and also gives temporary protection against various calf diseases. Experiments have shown that it is almost impossible to raise a calf that has not received any colostrum milk. For this reason, it is a good practice to feed the calf milk from its mother during the first four or five days.

After the calf has been removed from its mother, it should be placed in a clean stall and taught to drink. Teaching a calf to drink is usually not a difficult task. It should not be attempted, however, until the calf has been away from its mother from 8 to 12 hours. It will then be hungry and eager for food. By allowing the calf to suck several fingers of the hand held in the milk it will ordinarily learn to drink in one lesson. If, however, as sometimes happens, the calf is very stubborn and refuses to hold its head down in the pail, then more drastic methods must be followed. This habit can usually be overcome by backing it into a corner and forcing the head down until the muzzle is in the milk. By continuing this process several times, the calf will soon learn to drink from the pail.

Overfeeding Should Be Avoided

Cleanliness and regularity should be observed in everything concerned with the young calf's feed and care. All feeding utensils should be kept scrupulously clean. Sweet whole milk, only, should be fed during the first two or three weeks. The digestive capacity of the young calf is limited and incapable of handling large quantities of milk at one time. For this reason the milk should be given often, but in small amounts. During the first week or ten days after removal from the mother, three feeds should be given daily. Thereafter, two will be

sufficient for a healthy calf. The greatest care must be observed not to overfeed. Probably more calves die from the effects of overfeeding while young than from any other single cause. This is because most dairy farmers do not give enough attention to the amount of milk they feed the calf. Instead of measuring or weighing the milk fed each time, as should be done, they guess at the amount. This results in great variations in the amount fed each day, and almost invariably too much is fed. Some form of measure may be used if desired, but a spring scale, such as is used in weighing the milk from each cow in the herd, will be found most satisfactory. From 6 to 12 pounds of whole milk should be fed daily, the amount depending somewhat upon the size and vigor of the calf. A safe rule to follow is to feed one pound of milk for each ten pounds of live weight of calf. As already stated, sweet whole milk should always be fed during the first two or three weeks. However, milk rich in butterfat may sometimes cause digestive disturbances and should, therefore, be diluted with water or partly skimmed before feeding. The temperature of the milk fed is also very important, especially for young calves. A young calf will not thrive on cold milk. A temperature of 90 degrees F. is best for the calf, and care should be taken to provide it at this temperature at all times during the first two or three months. If this rule is to be followed, a thermometer must be used. Judging the temperature by the finger, as is commonly done, is unsatisfactory because the same milk will feel warm if the finger is cold and cold if the finger is warm. Feeding cold milk at one feeding and warm milk at the next is certain to upset the digestive system of the young calf.

SKIMMILK A GOOD CALF FEED

Nature provides the calf with food in the form of whole milk. The use of milk for human food has, however, largely deprived the calf of this natural food, and very few calves now receive any whole milk except during the first two to four weeks. Skimmilk is now recognized as the proper food for the calf after that age. While a few dairymen still insist that good results can not be obtained when skimmilk is substituted for whole milk, it has been fully demonstrated on numerous dairy farms and at many experiment stations that calves can be raised on skimmilk as well as they can on whole milk, and at about one-third the cost. The poor results sometimes obtained with it are almost always caused by careless methods of feeding and handling rather than by the skimmilk. It is true that the calf raised on skimmilk usually does not look quite so sleek as the calf fed whole milk during the first six months, but at the end of the first year the former is almost always

the better of the two. This is because the skimmilk calf usually begins to eat hay and grain at an earlier age, and when weaned at six months of age the change in food does not cause any set-back in its growth.

When to Begin Skimmilk Feeding

A healthy, vigorous calf may begin to receive some skimmilk in the ration when two weeks old. It is usually desirable, however, to delay the change until the third or fourth week, or until the calf is well started. The transfer from whole milk to skimmilk should always take place gradually. In making the change it is a good rule to withdraw one pound of whole milk, substitute one pound of skimmilk, and continue thus until the substitution is completed.

Farm separator skimmilk is superior to that obtained at the creamery, for calf raising. When a farm separator is used, the skimmilk should be fed immediately after separation. It is then at the right temperature (about 90 degrees F.) and is fresh and sweet. Creamery skimmilk is not so desirable, because it is not uniform in quality and may also serve as a carrier of disease, particularly bovine tuberculosis. Frequently, also, such milk must stand about during the day, thus becoming unfit for feeding. It is very important to feed milk of uniform quality and temperature at all times. There is probably no easier way to upset the digestive system of a calf than to give it sweet milk at one feeding and

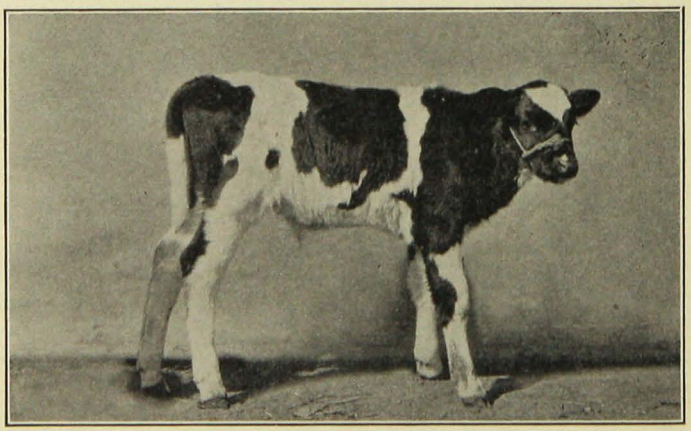

Fig. 2. A Vigorous Calf May Begin to Receive Skimmilk When About Two Weeks Old

sour milk at the next. Sour milk in itself is not harmful (good calves can be raised on it), but if good results are to be obtained it must always be uniform in quality. The same statements apply to temperature, the importance of which has already been discussed. It is far better to let

the calf miss a meal or two than to feed it milk of the wrong quality or temperature.

Skimmilk feeding should continue until the calf is six months old, and longer if the supply of milk is plentiful. The amount fed daily will depend upon the size and vigor of the calf. Usually not more than 18 pounds of skimmilk should be fed daily if a good hay and grain ration is provided. At first 10 or 12 pounds is sufficient, but the amount should be increased gradually as the calf grows.

GRAIN AND HAY CAN BE FED EARLY

Under normal conditions a calf will begin to nibble at hay when about two weeks old. At first the amount consumed will be very small; later a great deal more will be required. It is extremely important to the welfare of the calf that it receive all the hay it will consume at all times. Calves raised on milk and grain alone do not thrive; they become rough haired and appear unthrifty. Some have a characteristic form of convulsions or fits, and may die if roughage is not provided. Therefore, the calf should be encouraged to eat hay. Good clover hay is probably the best for calves; alfalfa must be placed second because of its too laxative effect at times. Timothy hay is satisfactory when supplemented by proper grain feeding. It should always be fed to calves suffering from scours or other forms of extreme looseness of the bowels. Ordinarily, no more hay should be fed at one time than will be eaten up clean each day. Calves will consume more hay if it is fed often in small amounts, because they do not like to eat food that has been nosed over.

The calf should be taught to eat grain about the time hay feeding begins. If the calf is in the pen with others it will learn from them. A good way to start is to rub some dry meal on its muzzle after feeding milk. It will taste the grain and soon learn to eat it from the feed box. Grain should never be fed mixed with the milk, as is sometimes done, because it will be swallowed without being chewed and may cause digestive troubles. The grain should always be ground medium fine and fed dry. At first the calf should be given all the grain it will consume, but later the amount should be limited. By the time the calf is six weeks old it will eat about half a pound of grain daily; as it grows this amount should be increased, but at no time until it is weaned, at about six months of age, is it necessary for the calf to receive more than three pounds a day if the proper amounts of milk and hay are being fed.

The kind of grain first fed is not of great importance. Almost any one or a combination of several of the ordinary farm-grown grains is satisfactory. The rather common belief that linseed oilmeal or other

high-protein concentrates must form a large part of the grain ration of calves raised on skimmilk is not founded upon fact. Skimmilk differs from whole milk only in that most of the butterfat has been removed. It contains a proportionately higher percentage of protein than whole milk. Therefore the calf fed skimmilk is actually receiving more protein in each pound of milk than if whole milk is fed, and there is no greater need for high-protein concentrates in the ration of the skimmilk calf than of the one raised on whole milk. What the ration of the skimmilk calf needs is something to take the place of the butterfat removed. In most parts of the country, corn is the cheapest source of this fat and should form a considerable part of the ration. The following grain mixtures have been used with good results:

Mixture 1: 300 pounds cornmeal
100 pounds ground oats or barley

Mixture 2: 300 pounds cornmeal
100 pounds wheat bran

Mixture 3: 300 pounds cornmeal
100 pounds barley or oats
100 pounds wheat bran

A feeding schedule for raising calves on skimmilk during the first 180 days, or six months, is given in Table 2.

Table 2. Daily Feeding Schedule for First 180 Days

Age	Whole milk	Skimmilk	Clover or alfalfa hay	Grain mixture
days	lb.	lb.	lb.	lb.
1 to 3	Leave calf with its mother			
3 to 21	8 to 12	.....	All hay and grain it will eat	
21 to 28	12 to 1	1 to 12	All hay and grain it will eat	
28 to 60	.....	12 to 14	All hay and grain it will eat	
60 to 120	.....	14 to 16	All hay it will eat	1.5 to 2
120 to 180	.....	16 to 18	All hay it will eat	2 to 3

These grain mixtures are satisfactory only when good clover or alfalfa hay is fed. If timothy or other low-protein hay is used it will be necessary to add 50 to 100 pounds of linseed oilmeal to each of the mixtures given.

GOOD CARE AS IMPORTANT AS GOOD FEEDING

Equal in importance to the feed that a calf receives is good care and management. Experience has taught that all the effects of proper feeding may be lost through faulty management. A very common method of handling the young calf immediately after removal from its mother is to place it in a pen with several older calves. The baby calf

is often roughly treated when this is done, being bumped and jostled about by the larger animals, and the practice should not be followed except when absolutely necessary. Instead, the calf should be placed in a small, clean pen by itself and kept there until about a month old, when it will be ready to associate with older calves.

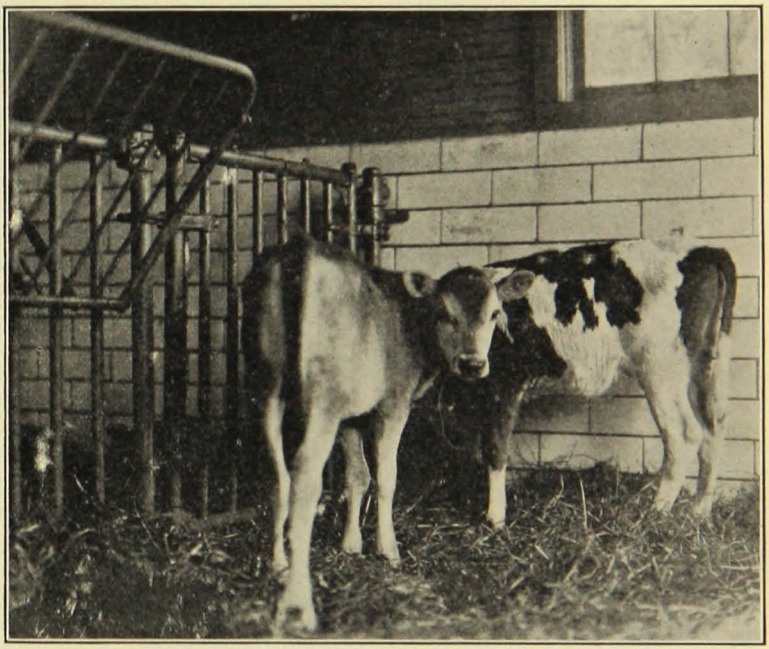

Fig. 3. Calves Should Be Kept in Clean, Well-Lighted Pens

Pens should be so located as to give calves an abundance of sunlight. Calves thrive best in a rather cool barn, but it is important that the pens be as free from drafts as possible. Young calves are very susceptible to colds, and pneumonia is a too common disease among them. It is, of course, essential that all pens be kept scrupulously clean and dry and provided with plenty of bedding. Feeding boxes should be provided for grain and racks for hay. In the larger pens, stanchions should be built along one side to insure each calf its proper share of milk. Without some such arrangement as this, feeding a group of calves is exceedingly difficult, considerable milk is spilled and the stronger calves often get more than their share of it. A simple and inexpensive stanchion may be constructed from boards, and will prevent losses of milk and insure better calves. By leaving calves in feeding stanchions they will be prevented from sucking one another, as they often do. Feeding the grain while locked in the stanchions, immediately after milk is fed, will also aid materially in preventing this habit.

A very common mistake is to turn calves out on pasture at too early an age. Pasture grass is too bulky for the stomach of the young calf to handle. Calves turned on pasture when too young often become unthrifty and take on a "pot-bellied" appearance. Exposing calves to wind and weather and to the torment of flies will further increase unthriftiness. A calf will grow and thrive best if kept in the barn and fed a regular ration of skimmilk, hay, and grain during the first four months of its life, exercise being provided out of doors during several hours of the day, when weather permits.

The change to pasture should be made gradually to allow the calf to become accustomed to the change in feed and environment. This can best be done by limiting the time the animal is in the pasture during the first few days and feeding it part of the regular dry ration in the barn.

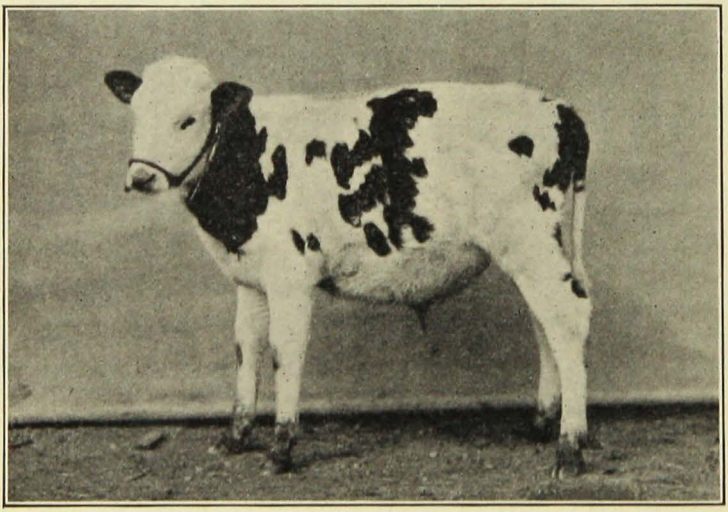

Fig. 4. A "Pot-Bellied" Calf—The Result of Improper Feeding and Management

The practice, sometimes followed, of feeding large amounts of silage to young calves is not to be commended, altho there is no harm in giving them a handful or two now and then. Silage, like pasture grass, is a very bulky feed, not adapted to the limited capacity of the calf's stomach, and when fed to young animals often causes digestive troubles. When calves are four months old or more they are able to consume considerable quantities of silage to good advantage.

After the calf is weaned, at about six months of age, it is important that it be fed in such a way as to continue in good health and make normal growth. Too frequently this is the beginning of a period of neglect which continues until the time of the first freshening of the

heifer. Often when milk feeding ceases grain feeding also stops and the calf is left to shift for itself, with little or no attention being given to its feed and care. This sort of treatment will cause the calf to stop growing or even to lose in weight and if allowed to continue for any considerable length of time may result in a runty or undersized animal at maturity. After weaning, instead of decreasing the amount of grain fed it should be increased to provide nutrients to take the place of those previously supplied by the milk. If such low-protein roughage as timothy hay or poor-quality pasture is being fed, the grain mixture should also be changed to include more bran and linseed oilmeal to replace the protein provided in the milk. It is desirable to provide good legume hay or pasture to the calf during this time.

After the calf has completely recovered from the shock of weaning, the amount of grain may be reduced gradually until at the age of about ten months it may be omitted entirely. From this age until a few months before freshening, good legume hay and corn silage in winter and good pasture in sumer will supply all that is necessary to promote the health and normal development of the heifer. Feeding some grain in addition to this will, however, usually result in more rapid growth, and, as a result, the animal will reach mature size at an early age.

Water is the cheapest nutrient in the ration. It is perhaps because of this that many neglect to provide the calf with enough of it. Just because a calf is receiving milk is no reason why it does not need water. A supply of fresh clean water should be available at all times. Likewise, a clean supply of salt should always be provided.

VITAMINS ARE ESSENTIAL TO GROWTH

The vitamins are accessory food substances that are essential to the growth and well-being of animals. Thus far at least six different vitamins have been discovered. These substances are present in the food, but not all foodstuffs contain them in equal quantities. Feeds may be rich in one or more vitamins and deficient or entirely lacking in others. Different species of animals also differ in their requirements for them. Studies made at this station indicate that only two or possibly three specific vitamins must be provided in the rations of dairy calves. Under ordinary conditions of feeding, as practiced on the average dairy farm, there is only a slight possibility of calves suffering from a lack of any of these essential vitamins. Certainly, there is little probability of a deficiency if the ration fed provides a liberal amount of good-quality hay and the calf is allowed to exercise in the sunshine out-of-doors for an hour or two daily.

MINERALS ARE NEEDED

In recent years the subject of the mineral requirements of animals has received considerable attention. As yet, however, little is known about the actual requirements of cattle for them. The relation of minerals to health and vigor in animals has, however, been definitely established. Growing animals require the various minerals to build tissues and promote proper functioning of the organs and tissues of the body. Calcium and phosphorus are perhaps most often deficient in rations because they are required in the largest amounts by the body, the skeleton being made up largely of these two elements. Sodium, chlorine, iodine, and various others also are essential, but are needed only in comparatively small amounts.

The danger of a deficiency of mineral in the ration of calves is slight if they are fed as prescribed in this bulletin. Milk, with either clover or alfalfa hay, provides an abundant supply of calcium as well as some phosphorus; grain mixtures contain a high percentage of phosphorus with less calcium, and as the calf should always have free access to salt, there will be no lack of sodium and chlorine. There is usually sufficient iodine in the feed, but it may be lacking in certain sections of the country where the soil is deficient in this element, as in parts of Minnesota. Goiter in calves or hairlessness in pigs is definite evidence of such a deficiency. To meet this situation the Division of Veterinary Medicine recommends the feeding of either sodium or potassium iodide to pregnant animals. These may be given in the feed daily in one-grain doses or once a week in seven-grain doses. Another method is to provide iodized salt in place of ordinary salt.

Occasionally either calcium or phosphorus may be deficient in the rations of cattle. If growing calves show a lack of appetite for good-quality hay or exhibit a desire to chew on old bones or boards, the ration is probably deficient in phosphorus. Licking or eating soil suggests a probable calcium shortage. In either case, a simple way to provide additional amounts of these minerals is to allow the calves free access to a supply of bonemeal of the kind made especially for feeding to livestock. This product contains both calcium and phosphorus in about the proportion they are found in the body. If calves will not eat the bonemeal when provided in this way, it may be mixed and fed with the grain at the rate of one to three per cent of the mixture. Mixing it with salt at the rate of one part of salt to three of bonemeal will also prove quite satisfactory, especially with the older calves. Mineral mixtures on the market may be used in place of bonemeal, but the results will be no better than when bonemeal alone is fed, and perhaps not so good. This is because the essential ingredient in most mineral

mixtures is bonemeal, but in addition to this, some of them also contain large amounts of cheap material as filler, which is of little or no value to animals but adds greatly to the weight and consequently also to the cost. For further information regarding mineral feeding, the reader is referred to Special Bulletin 94, "Minerals for Farm Animals."

NORMAL GROWTH RESULTS FROM PROPER FEED AND CARE

A calf, when properly fed and cared for, will grow and develop at a normal rate. Growth in a calf is measured in terms of gain in weight, altho height measurements also are sometimes used. Table 3 gives the normal weight and height of calves from birth to two years of age

Table 3. Normal Weights and Heights of Holstein, Jersey, and Ayrshire Females from Birth to Two Years of Age*

Age	Holstein		Jersey		Ayrshire	
	Normal weight	Normal height	Normal weight	Normal height	Normal weight	Normal height
mo.	lb.	in.	lb.	in.	lb.	in.
Birth	90	28.2	55	26.0	69	...
1	121	30.2	76	27.6	90	27.5
2	157	32.3	105	29.4	128	29.5
3	200	34.2	140	31.2	170	31.2
4	249	36.2	174	33.0	218	33.1
5	302	38.0	222	35.1	254	35.1
6	349	39.7	260	36.9	286	36.5
7	389	40.9	302	38.1	304	37.3
8	425	42.2	340	39.3	336	38.5
9	466	43.0	376	40.4	366	39.0
10	501	43.8	407	41.3	406	39.7
11	529	44.3	432	41.9	427	40.1
12	558	44.9	456	42.6	456	40.7
13	574	45.5	480	43.3	485	41.3
14	596	46.2	503	43.8	533	42.0
15	612	46.7	520	44.3	547	42.4
16	643	47.3	533	44.6	560	42.7
17	660	47.7	553	45.1	579	43.1
18	686	48.0	572	45.9	604	43.8
19	715	48.2	598	46.0	627	44.2
20	746	48.7	621	46.2	651	44.6
21	774	49.0	649	46.5	679	44.9
22	796	49.2	668	46.8	707	45.4
23	824	49.5	689	47.1	733	45.6
24	841	49.8	716	47.4	759	45.9

* Data from Missouri Research Bulletin 36, by C. H. Eckles.

for three dairy breeds, based upon averages from a large number of animals. Calf owners should follow the practice of weighing or measuring all calves at birth and at regular intervals thereafter. Comparisons with weights and heights in this table will then indicate whether or not a calf is of normal size and is gaining at the normal rate for

the age. A properly fed calf will usually be of normal size or above unless it was small at birth, in which case several months may elapse before normal size is reached. It is not unusual for a healthy, vigorous calf to be as much as 20 per cent above the normal weight. Calves that remain below normal in size or that gain at a subnormal rate over long periods of time, are probably suffering from some ailment or from improper feeding, or both, and the cause should be determined if possible.

CALVES SHOULD BE MARKED FOR IDENTIFICATION

Every calf raised in the herd should be given some mark for identification, soon after birth, and the mark should be entered in the herd record book. The common method of depending on memory alone for the identification of animals results in frequent mistakes and for this reason is unsatisfactory.

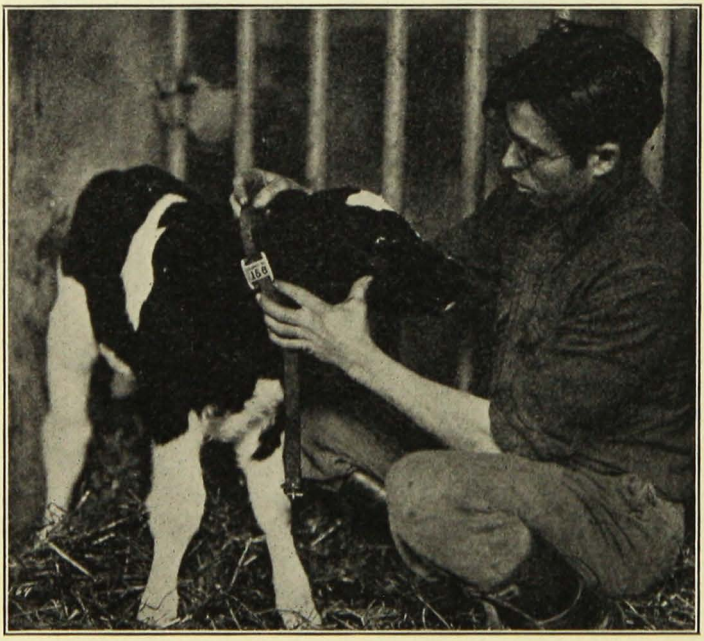

Fig. 5. Give the Calf a Herd Number
A number tag on the neck strap will make it possible to identify the calf at any time.

Several methods of marking are used. The most common are the ear tag, the neck strap with brass number plate, and tattoo marks in the ears. Ear tags of various forms and materials are perhaps the most common. These bear numbers and may also carry the name and ad-

dress of the owner. They are attached by piercing the ear. This method is inexpensive, but has the disadvantage that the tags are frequently torn from the ear by being caught in the brush or through rubbing against some rough object and thus the mark is lost and the animal may become disfigured.

The leather strap with brass tag slipped on can not disfigure the animal and makes identification easy, because the number can easily be seen at a distance. The cost is perhaps the most serious drawback to this system, as leather neck straps are comparatively expensive and must occasionally be replaced when they wear out or are lost.

Tattoo marks in the ear likewise do not disfigure the animal and if properly done leave a permanent mark for identification. This system, on the other hand, is not entirely satisfactory because close inspection is required to distinguish the marks, and with dark-skinned animals it is sometimes difficult to see the marks.

Perhaps the most satisfactory plan is to use either of the first two methods during the first year or two, or until the animal becomes familiar to the attendants, then when the animal is about a year old tattoo marks should be placed in the ears, making it possible positively to identify the animal at any time.

EARLY DEHORNING IS ADVISABLE

Horns on cattle are responsible for frequent injuries to members of the herd as well as to the caretakers. For this reason, except in the case of some purebred show herds, it is usually desirable to remove the horns. The best time to dehorn cattle is while they are still young calves, when the growth of horns can easily be prevented by the application of caustic soda or potash to the horn buttons. Preventing the growth of horns gives a more symmetrical appearance to the poll and eliminates the dangers of infection resulting from a dehorning operation. It is also less painful to the animal if properly done. The treatment with caustic should be given before the calf is a week old. Great care should be taken in the handling and application of the caustic. The stick should always be wrapped in paper so as to protect the hands. The hair around the horn buttons on the head of the calf should be clipped and the area washed clean with warm water and soap, and wiped thoroly dry. The end of the stick of caustic should then be moistened slightly and the tip rubbed on the horn buttons, which may be felt on the head of the calf—first on one, then the other—two or three times, allowing the caustic to dry after each application. Care must be taken to apply the caustic only to the horn button and not on the surrounding skin, where it will cause intense pain. This often happens when there

is too much moisture on the stick of caustic, which allows the application to run to the surrounding area. For some time after the application the calf should be protected against exposure to rain, because water will cause the caustic to run down the sides of the head, causing severe burning pain.

COMMON DISEASES AND AILMENTS

Calves, like other farm livestock, are subject to many ailments and diseases of more or less serious nature. Only a few of the more common ones will be considered here.

Indigestion, or Scours

Indigestion, or scours, is perhaps the most serious obstacle in the way of successful calf raising. It usually results from a disturbance of the digestive tract caused most frequently by improper feeding, of which overfeeding is probably the most common. This is due to the fact that not enough care is taken to regulate the amount of milk fed. The only way to be sure that the calf is getting the correct amount of milk is to weigh or measure it and feed each calf separately. The too common practice of allowing several calves to drink from the same bucket or trough should not be tolerated. Irregular feeding, sudden change of feed, feeding unclean milk, or using dirty buckets and feed boxes may also cause scours. The disease is indicated by the characteristic foul-smelling dung. Prevention of the trouble is always easier than its cure. At the first signs of digestive disturbance, affected animals should be isolated. The amount of milk fed should be reduced by at least one-half, and if legume hay is being fed, it should be replaced by timothy or prairie hay until the trouble disappears.

It is also well to examine all utensils used in feeding to see that they are clean. Very often feed buckets are allowed to become filthy from lack of proper cleaning. Thoro washing once a day with soap and hot water is necessary. A dose of two to four tablespoonfuls of castor oil mixed with half a pint of warm, fresh milk should be given. This removes the irritating material and later acts as an astringent. After five hours, give a heaping teaspoonful of a mixture of one part salol and two parts each of subnitrate of bismuth and bicarbonate of soda. This treatment may be repeated at intervals of five or six hours. These ingredients may be purchased at any drug store in the proper proportions ready for use. Boiling the milk, feeding raw eggs together with flour, and adding limewater to the milk are some common home remedies for combating the trouble. In severe cases a reliable veterinarian should always be called. It is well to remember that after an animal

has once been afflicted with the trouble, it is usually more susceptible to another attack and therefore greater care is necessary in its feeding and management.

White Scours, an Infectious Disease

White scours is perhaps the most dreaded of all calf ailments, for once it gains entrance into a herd it may cause the loss of an entire season's calf crop. It is an infectious disease which appears shortly after birth and is indicated by a diarrhea with light-colored foul-smelling droppings. A large percentage of the calves attacked by the disease die. The germs which cause the disease may enter the body of the calf through various channels, but most frequently by way of the digestive tract. During the progress of the disease the calf becomes dull and listless, grows weaker, and refuses all food. Death usually follows within a day or two. There is, as yet, no known positive cure for the disease. Prevention is the best means of combating it. This can best be done by providing the cow with a clean, dry, and thoroly disinfected box stall for calving. Infected calves should be isolated and quarters disinfected at the first appearance of the disease. Great care must be exercised by persons caring for the calves not to carry the disease from one animal to another.

Because of the serious nature of this disease the services of a reliable veterinarian should always be obtained whenever its presence is suspected. To neglect to do so may bring about the loss of an entire season's calf crop through the disease spreading from one animal to another.

Lice at Worst in Winter

Calves suffer most from the infestation of lice during the winter season, and unthrifty animals always appear to be the most seriously affected. Three kinds of lice affect cattle. Two are the sucking type, commonly known as blue lice, and the other is the red biting louse. The former are the more injurious. The itching sensation resulting from the presence of lice causes calves to rub against posts and walls of pens and to lick themselves; the hair comes out, and the skin often becomes thickened and mangy in appearance.

Dipping infested animals in a cresol or nicotin dip is perhaps the best method of destroying lice, but is impracticable on most dairy farms. Kerosene emulsion treatment is the most satisfactory when dipping is not practicable. "To make this emulsion, dissolve one-half pound of hard soap in one gallon of boiling soft water. As soon as the soap is dissolved, add two gallons of kerosene, mix by pumping with a spray pump or by other means until a thick, creamy emulsion is formed from

which the oil does not readily separate. Before use, add this mixture to 19 gallons of water. The emulsion may be applied with a spray pump or with a brush. The application of raw linseed oil on the parts affected and along the spinal column helps to control lice. Ground sabadilla seed dusted on the calves is also recommended for killing lice, and can be used when the weather is too severe for liquid application." [1]

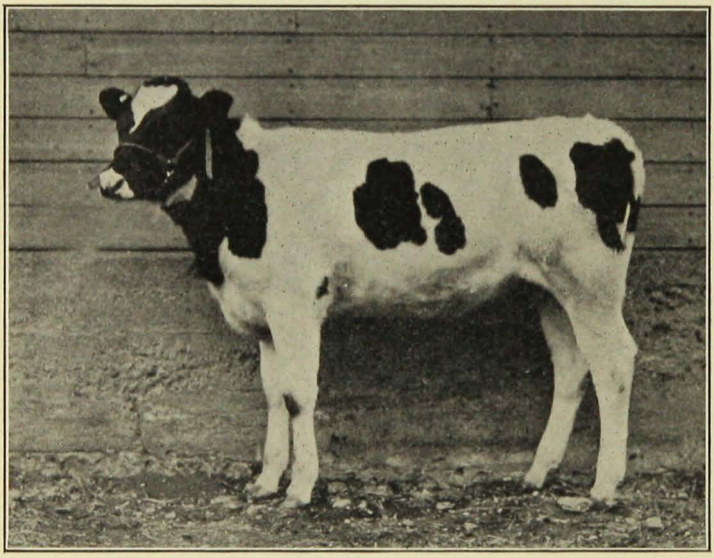

Fig. 6. Good Type of Calf at Six Months of Age—Raised on Skimmilk

Whichever method of eradication is followed, the treatment should be repeated several times at intervals of 10 to 14 days, to destroy any lice that may hatch after the first application.

Ringworm, a Skin Disease

Ringworm is a parasitic skin disease frequently found among calves. It is highly contagious, being readily transmitted from one animal to another and also to man. There are two forms of the disease, the treatment for both being the same. The most frequent form is indicated by the formation of circular patches of scaly, brittle crust on the skin, from which the hair soon drops. The patches appear silvery gray when incrusted, and are found chiefly on the head and neck. There is also more or less itching.

The treatment consists in the removal of all crusts by washing with water and soap, followed by the application of acetic acid or tincture

[1] From Dairy Cattle and Milk Production, by C. H. Eckles, pp. 446-47.

of iodine to the affected area once daily. The premises where calves are kept should be thoroly cleaned and pens whitewashed to destroy any spores which may have been scattered.

Mange Is Quarantinable

Mange is a quarantinable disease. It is caused by small mites which multiply rapidly and are spread from diseased to healthy animals by bodily contact, or by pens and stables recently occupied by mangy cattle. The mites attack the skin and cause it to become thickened and covered with crusts and scabs, and the hair drops out. Itching is intense and affected animals are constantly trying to rub and lick themselves. There are several forms of mange, each more or less confined to different regions of the body. The treatment is the same for all but one, for which there is no known treatment, but this form is seldom or never found on calves.

Dipping the affected animal in lime-sulphur or a nicotin dip is perhaps the most effective way of destroying the mites. However, the application of the kerosene emulsion in the manner suggested for lice is also effective and probably the most practicable on the average dairy farm. As in the case of lice, several applications about 10 or 12 days apart are necessary for complete eradication.

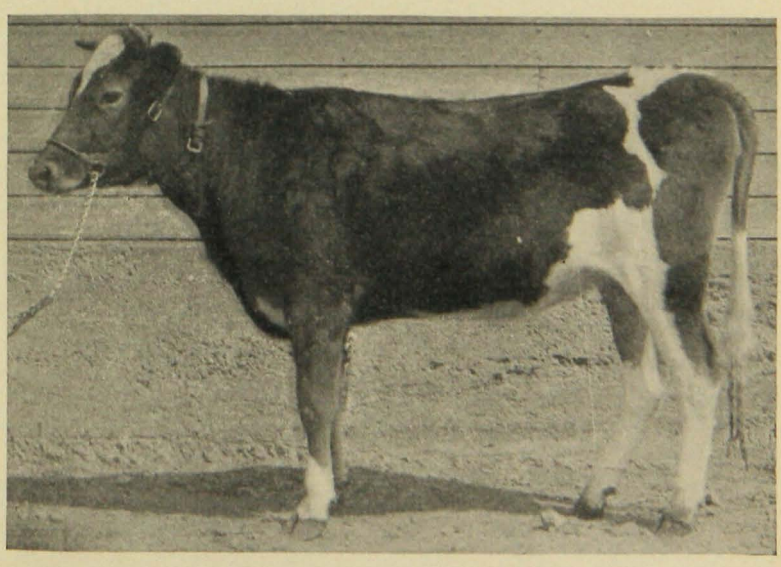

Fig. 7. Heifer Calf About One Year Old

Keep the heifer growing by feeding her good roughage and some grain until she is 10 months old. After that, legume hay and corn silage will be sufficient until a few months before freshening.

Breach at the Navel, or Umbilical Hernia

This trouble results from imperfect closing up of the muscles around and near the navel. It is indicated by a soft swelling at the navel which can be pressed completely back into the abdomen with the hand. In the case of a small hernia, treatment is not always necessary, for as the calf grows and the diet is changed to more solid food it will often disappear. For the treatment of the larger ones and for those that do not disappear in this way, the services of a veterinarian should be obtained.

Warts Easily Treated

Calves are frequently affected with warts. Small and slender warts may be cut off with shears and the stump touched with nitrate of silver. The larger, broader ones may be cut out or a strong cord may be tied as firmly around the base as possible. This will cause them to shrivel and drop off. Any later tendency to grow may be stopped by applying a red-hot iron or some nitric acid to the spot. In many instances warts may diseappear if they are kept soft by the application of sweet oil or olive oil.