



# *Raising* DAIRY CALVES

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# AGE, WEIGHT, AND CHEST GIRTH STANDARDS FOR GROWING DAIRY HEIFERS

(From Extension Circular 622, University of Nebraska)

Age	Holstein females		Ayrshire females		Guernsey females		Jersey females	
	Weight	Chest girth	Weight	Chest girth	Weight	Chest girth	Weight	Chest girth
	<i>Pounds</i>	<i>Inches</i>	<i>Pounds</i>	<i>Inches</i>	<i>Pounds</i>	<i>Inches</i>	<i>Pounds</i>	<i>Inches</i>
Birth .....	92	30.0	72	29.0	67	29.0	54	26.0
1st month.....	102	32.0	82	31.0	76	30.0	66	28.0
2nd month.....	138	35.0	114	35.0	98	33.0	92	31.0
3rd month.....	186	38.0	157	38.0	138	37.0	130	35.0
4th month.....	251	43.0	218	42.0	182	40.0	181	39.0
5th month.....	307	46.0	280	46.0	234	43.0	230	42.0
6th month.....	369	49.0	328	48.0	289	46.0	274	44.0
7th month.....	429	52.0	389	51.0	338	49.0	324	47.0
8th month.....	492	54.0	441	53.0	390	51.0	365	49.0
9th month.....	553	57.0	486	55.0	437	53.0	407	51.0
10th month.....	613	59.0	512	56.0	468	54.0	447	53.0
11th month.....	645	60.0	556	58.0	513	56.0	491	55.0
12th month.....	701	62.0	587	59.0	566	58.0	515	56.0
13th month } .....	762	64.0	643	61.0	592	59.0	560	58.0
14th month }								
15th month } .....	829	66.0	700	63.0	667	62.0	613	60.0
16th month }								
17th month } .....	898	68.0	754	65.0	727	64.0	667	62.0
18th month }								
19th month } .....	968	70.0	824	67.0	761	65.0	703	63.0
20th month }								
21st month } .....	1,044	72.0	871	68.0	827	67.0	763	65.0
22nd month }								
23rd month } .....	1,122	74.0	930	70.0	901	69.0	801	66.0
24th month }								

Cover picture: Group of 6-months-old grade Jersey heifers raised on dry calf meals.  
See pages 8 and 9.

# Raising Dairy Calves

By

I. R. JONES and H. P. EWALT

**D**URING 1942, approximately 260,000 dairy cows were milked on Oregon farms. The average productive life of the dairy cow is about 5 years. This means that more than 50,000 heifer calves must be raised annually to replace the cows going out of production. Also, a considerable number of calves and cows have been raised in Oregon in the past for sale out of the state. In addition to the heifer calves, about 10,000 bull calves are raised annually in Oregon for use as herd sires.

## COST OF RAISING HEIFERS

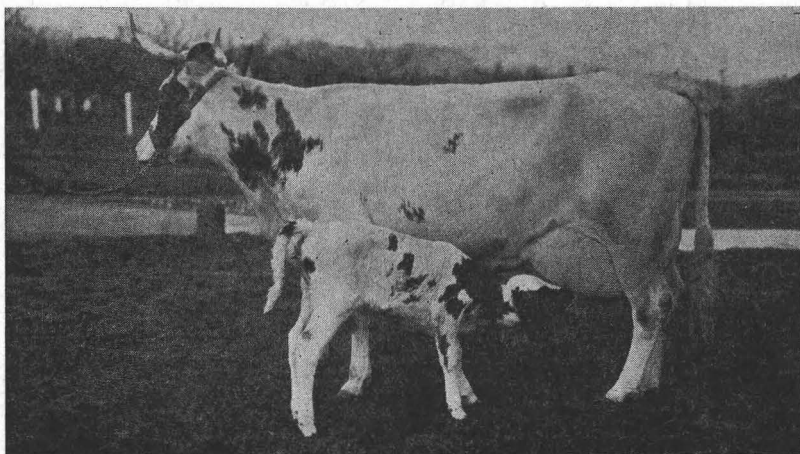
The cost of raising a calf from birth to first freshening at about 25 months of age ranges between \$70 and \$125, depending largely on the prices of feed and labor. About one-half of this represents feed cost. About 10 per cent of the cost of raising calves represents losses on heifers that die after having expended on them a considerable investment in feed and other cost items. This loss can be reduced by careful feeding and management. The price received on the average for heifers sold is 10 per cent below the cost of raising them. The importance of calf-raising on Oregon dairy farms is indicated by the annual expenditure of about \$6,000,000 in bringing them to maturity.

Too often the purchased cow is a poor producer, short-time milker, slow breeder, or has a chronic udder infection. It is the safest and, over a period of years, the most economical policy for a dairyman to plan on raising the number of heifer calves necessary to maintain or to increase the size of his milking herd. The good dairyman, therefore, should consider the job of raising calves as important and necessary, if he is to make the greatest success of the dairy herd enterprise.

## SELECTION OF THE CALF TO RAISE

The main consideration in selecting the heifer to raise should be given to the possibilities and probabilities of her inheriting good milk and butterfat producing ability from her parents. It costs just as much to raise a heifer inheriting low producing ability as it does one that has inherited the genes for high production. The calves selected for raising should be from the best producing and trans-

mitting cows in the herd. The best cow families in the herd can be easily determined by actual records of production for several generations.



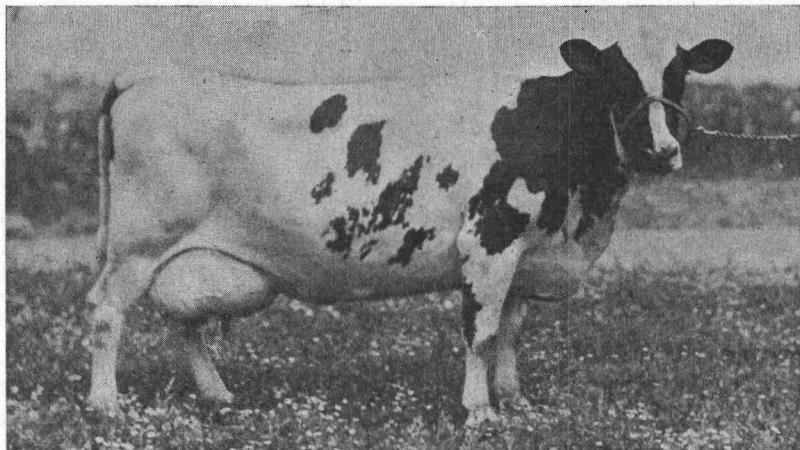
Inheritance is very important in selecting the calf to raise.

When the above calf was born, January 5, 1925, her dam had completed two records as follows, 12,772 pounds milk, 539.6 pounds butterfat as 2-year-old and 14,682 pounds milk, 604.0 pounds butterfat as 3-year-old. The first five daughters of the sire of the calf were in production and doing well.

Because of his greater opportunity, the herd sire represents the greatest possibility of improving production in any herd. The need for raising only heifer calves sired by a good dairy bull can hardly be overemphasized. If the bull owned is not an animal backed by good production records and transmitting ability, the dairyman should replace him or consider the possibility of breeding some of the best cows in the herd to desirable bulls owned by neighboring dairymen. *If the cows in the herd have no records, or only low records, of production and the sire is not a well bred dairy bull, the calves to be raised should be purchased from the herds of dairymen who do have such animals. The cost is too great to raise heifers that do not inherit good milk and butterfat producing possibilities.*

The calf selected to raise should be large, healthy, and vigorous at birth. Too often weak calves succumb to the common calf ailments or do not grow economically. Breed type and dairy conformation are of considerable importance, particularly in the case of calves of purebred cattle. The ancestors of the calf to be raised should show good fertility, long life, desirable body conformation, and large

feed capacity. The udders of the female lines should show large capacity, desirable quality, good shape, and strong attachments.



The calf pictured on the opposite page is shown above at 14 years of age. She lived to more than 16 years of age and produced in thirteen lactations, 144,452 pounds milk and 5,568 pounds butterfat.

### FEEDING THE CALF—BIRTH TO SIX MONTHS

**Whole milk feeding period.** It is very essential that a new-born calf receive the colostrum milk that the dam produces the first few days following calving. Colostrum milk is very rich in vitamins, particularly vitamin A, contains a high percentage of very necessary proteins and antibodies obtained from the dam's blood that when taken into the digestive tract of the calf tend to prevent infections. Colostrum milk also has a desirable laxative effect. Ordinarily the calf will stand and nurse within 2 hours after birth. If it does not, it should be assisted or the colostrum should be fed from a bottle.

The calf can be left with the mother for about the first 48 hours, after which it should be placed in a pen by itself and taught to drink from a pail. Usually if milk is not offered to the calf for 12 to 24 hours after being removed from its mother, there is little difficulty in getting it to drink. In giving the calf its first drinking lesson, 2 to 4 pounds of fresh, warm milk are placed in a pail, the amount depending upon the size of the calf, the calf is backed into a corner, the feeder straddles the calf's neck, holding the pail with one hand and moistening the fingers of the other hand with milk, he places them in the calf's mouth. As the calf begins to suck the hand is



gently lowered into the pail until the milk is being drawn up between the fingers. One should be careful not to immerse the nostrils in the milk. As the calf sucks, the fingers may be withdrawn. The lesson may have to be repeated a number of times but with a little patience the calf soon learns to drink. The calf should continue to receive its own dam's milk for the first 4 or 5 days, after which it can be fed milk from any cow in the herd.

**Amount of milk to feed.** The careful feeding and handling of the calf for the first few weeks is very important. There is much greater danger of the young calf being overfed than underfed. For the first 10 days of the calf's life, not more than 8 per cent of the calf's body weight should be fed in the form of milk daily. A small Jersey calf weighing 50 pounds at birth would thus receive 4 pounds of milk *per day* and a large 100 pound Holstein calf about 8 pounds per day. The true stomach of the baby calf is very small and if the calf is overfed part of the milk may pass into the rumen, where it will set up putrefaction rather than normal digestion. If overfed, moreover, the baby calf may not digest all of the milk before the next feeding. Digestive disturbances due to overfeeding result in the death of many calves.

It is desirable to feed the calf three times daily for the first week, particularly if it is not too vigorous. The daily allowance of milk is divided into three feedings instead of two. Digestive disturbances are less apt to occur when smaller amounts of milk are fed at more frequent intervals. If the herd is one with a high butterfat test, it is desirable either to add about one-third part skim milk to two-thirds part of whole milk or to dilute the milk with one-third part water. Milk with a high butterfat content is not easily digested by the baby calf.

After the calf is about 10 days of age a good rule to follow is to feed 1 pound of milk daily for each 10 pounds of body weight. The amount of milk fed should be determined by weighing on a scale rather than by guessing. Guessing is apt to result in overfeeding and ensuing digestive disturbances.

Milk should be fed in clean buckets that have been sterilized with steam, boiling water, or chlorine solution. The milk should be fed at regular intervals and at the same temperature, preferably that of blood heat.

**Control of calf dysentery.** If the calf should develop an attack of scours, the milk allowance should be omitted for one feeding and reduced to one-half for 2 days. If the condition improves, the

amount of milk may be gradually increased again to the normal allowance. Careful feeding, especially for the first 3 weeks, will go a long way toward preventing digestive disturbances and will result in a more rapid growth as the calf gets older. Milk from mastitis-infected cows should not be fed to very young calves.

At times dairy barns and particularly the maternity pens become contaminated with bacteria that cause so-called "white scours" in calves. The calves develop severe diarrhea, the discharge being a dirty yellow color, very fluid, and having an extremely offensive odor. The calf becomes weak very quickly, and unless treatment is given, usually dies. In severe outbreaks the calves may even die before diarrhea occurs.

Excellent results have been obtained in preventing or controlling white scours by the administration of *acidophilus milk*. This treatment, developed by the Department of Veterinary Medicine at the Oregon Agricultural Experiment Station, is being widely used with excellent results. In case the disorder has been prevalent in a herd, the acidophilus milk should be given as a preventive shortly after the birth of the calf even though the maternity and calf pens have been thoroughly disinfected.

Acidophilus milk can be obtained in 1-pint, vacuum-packed tins from the Department of Dairy Husbandry at Oregon State College. One can is sufficient for two calves, or in case it is necessary to repeat the dose, for one calf. By mail prepaid the present cost in Oregon is, one can, 36 cents, two cans, 58 cents, three cans, 82 cents, etc. Further details can be obtained by addressing the College.

**Length of whole milk feeding.** Calves should be fed whole milk for periods ranging from 3 to 5 weeks, depending upon the vigor of the individual calf. It is preferable to feed a smaller amount of whole milk daily over a longer period than to feed a larger amount over a short period. Adequate milk is supplied by following the general rule of 8 per cent of the body weight daily, or 1 pound of milk for each  $12\frac{1}{2}$  pounds of body weight for the first 10 days, followed by 1 pound of milk for each 10 pounds of body weight as the calf becomes older. On the average, a Jersey calf would be receiving about 7 pounds of milk daily at 1 month of age, a Guernsey or Ayrshire calf 8 to 9 pounds and a Holstein calf about 12 pounds. When the period of whole milk feeding is discontinued either by changing the calf to skim milk or by feeding a calf meal, this should be done gradually over a 4- or 5-day period.

**Skim milk feeding.** In case skim milk is available, it is an excellent feed for raising dairy calves after the starting period on

whole milk. The amount of skim milk fed can be increased until the calf is receiving about 14 pounds daily. The calf will utilize larger amounts than this but usually more profitable returns can be obtained by feeding any surplus skim milk to other calves, poultry, or hogs.

The length of time that skim milk should be fed depends upon its availability. It is a common practice by many of the better dairy-men to feed skim milk until the calf approaches 6 months of age. When there is a strong demand for milk and milk products, including skim milk powder, it is questionable whether the dairyman would be justified in feeding skim milk beyond 6 months of age. If careful attention is paid to the formulation of the replacement ration, weaning from skim milk can be started with thrifty calves after about 4 months of age.

**Supplements to skim milk.** The main difference between whole milk and skim milk is the butterfat that it contains and the fat soluble vitamins carried by this butterfat, especially vitamin A, which is of particular concern to the young calf in promoting growth and in building up body resistance to infections of all kinds. It is important, therefore, that the calf be allowed all of the fine-stemmed, green sun-cured leafy hay it desires. Usually the legume hays are more leafy and are higher in *carotene*, which the calf utilizes to form vitamin A, than are the nonlegumes.

The calf being fed whole and skim milk should have concentrate feeds beginning at an early age. Usually it will start eating grain when about 2 weeks old. A mixture of whole, rolled, or coarsely ground home grown grains will give satisfactory results in supplementing skim milk. Oats alone, either whole, rolled, or coarsely ground, may be successfully fed. Usually the calf can be allowed all the grain it wants until 6 weeks to 2 months of age when it will eat at least 1 pound daily. At 3 months of age, about 2 pounds daily should be consumed. This is sufficient to keep the calf growing when fed with skim milk and a good quality hay. The calf should also have free access to water, salt, and sterilized bone meal.

**Feeding on dry-fed calf meals.** On many dairy farms whole milk is sold and the feeding of calves presents somewhat more of a problem than when skim milk is available. The dairy calf can be successfully and economically raised, however, on a calf meal. The recommended calf meals are fed dry. They differ from most concentrate mixtures fed to cows in that they should contain a source of animal protein, are considerably higher in total protein and energy value, and may contain additional minerals and vitamins.



Good calves have been raised by feeding calf meals based on formulas developed at Oregon and other agricultural experiment stations. To supply the animal protein, from 12 to 15 per cent of the mixture should come from skim milk powder, blood meal, or fish meal. Two recommended calf meals are made up of the following ingredients:

<i>Calf meal A</i>		<i>Calf meal B</i>	
	<i>Pounds</i>		<i>Pounds</i>
Wheat, coarsely ground .....	325	Barley, ground .....	250
Oats, ground .....	325	Oats, ground .....	245
Wheat bran .....	100	Linseed oil meal .....	150
Linseed oil meal .....	100	Wheat bran .....	125
Blood meal .....	120	Skim milk powder .....	100
Bone meal, sterilized .....	20	Blood meal .....	50
Salt .....	10	Alfalfa leaf meal .....	50
		Bone meal, sterilized .....	20
		Salt .....	10
	<i>Per cent</i>		<i>Per cent</i>
Crude protein .....	20.2	Crude protein .....	20.3
Digestible protein .....	17.8	Digestible protein .....	17.2
Total digestible nutrients .....	74.0	Total digestible nutrients .....	71.3
Calcium .....	1.16	Calcium .....	0.98
Phosphorus .....	1.09	Phosphorus .....	0.90

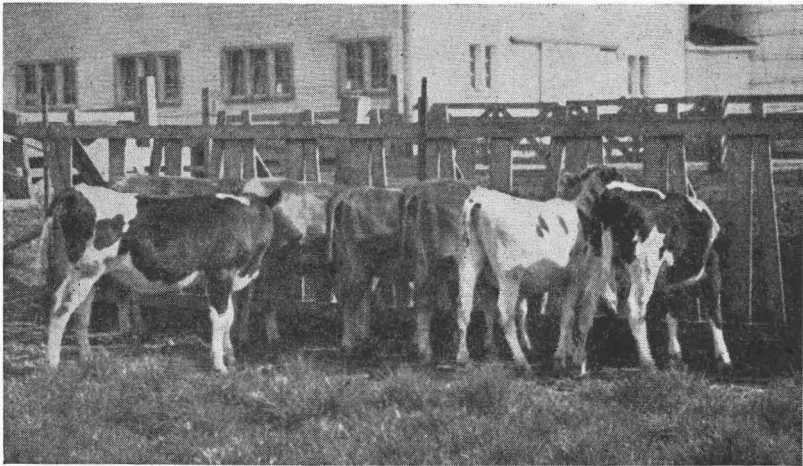
Calf meal feeding should be started at from 10 days to 2 weeks of age. From this time until at least 6 weeks of age the calf should be allowed all it will eat. At about 4 weeks, when whole milk feeding is discontinued, the calf should be consuming at least a pound of the calf meal daily. At 60 days of age, about 2 pounds, and at 90 days and thereafter 3 pounds should be fed daily until the calf is about 6 months of age. The amount of the calf meal necessary to keep the calf growing will depend somewhat on the size of the calf and considerably on the quality of the roughage available. With poor quality hay it may be necessary to increase the calf meal allowance to 4 pounds daily. (Cover picture shows calves raised on calf meals.)

*It is very important that unlimited quantities of fresh, clean water should be available at all times.* This is particularly important when a dry calf meal is fed. It is very essential, also, that the calf have free access to good quality green, leafy, sun-cured legume or mixed legume and nonlegume hay. The calf is dependent upon the hay for an adequate supply of vitamins A and D in addition to the protein, energy, and minerals that it furnishes. This would be particularly true if calf meal A were being fed. If only poor quality hay is available, calf meal B should be fed or supplemental vitamins A and D should be supplied by feeding daily 2 teaspoonfuls of fish liver oil or 1 pound of sun-cured alfalfa leaf meal.

## FEEDING THE HEIFER AFTER SIX MONTHS OF AGE

**Feeding from 6 to 12 months.** On most dairy farms the heifer after about 6 months of age is a very much neglected animal. Too many dairymen pay considerable attention to the calf from birth to about 6 months of age and then erroneously believe that the heifer can more or less shift for herself.

It is impossible for the young animal to grow on a scant ration just as it is impossible for dairy cows to produce milk on a poor ration. The young animal has a natural capacity to grow at a satisfactory rate provided it is kept in good health and at no time lacks proper feed. Whether it grows rapidly or not depends on whether it is fed sufficient and suitable feeds. Poor cows may not respond with an increase in milk flow when they are given a good ration, but young heifers will not fail to grow if they are properly fed.



Heifers between 6 and 12 months of age do well on pasture but they must have grain in addition to pasture to keep them growing.

In most cases the period from 6 to 10 months in a calf's life is the time when it is most apt to be neglected. The heifer at this age has not developed sufficient digestive capacity to handle enough of the bulky foods to make normal growth on roughage alone. Many dairymen assume that grass is a perfectly adequate feed for heifers of this age. Actually grass contains about 80 per cent water and the digestive organs of the calf are not able to handle sufficient amounts of grass to insure normal growth. Similarly, heifers fed on hay or

hay and silage for the period from 6 to 10 months usually cannot consume sufficient amounts to grow at a normal rate.

Generally, roughage, either as pasture, or hay and succulent crops, is the least expensive feed, and should form the main part of the heifer's ration. In order to get normal growth, however, the roughage should be supplemented with from 1 to 2 pounds of grain per animal daily during the period from 6 to 10 months of age. After the age of 10 to 12 months calves will consume proportionately greater amounts of roughage, and, if it is abundant and of excellent quality, grain feeding is not necessary.

The normal *Weight, and Chest Girth* data given in the table on page 2 will indicate whether the heifer is continuing to grow at a normal rate and should enable the dairyman to determine how much grain should be fed.

**Feeding the yearling heifer.** The period from approximately 1 year of age until 2 or 3 months after calving is the easiest and cheapest period in raising dairy heifers. It is a very important period, however, and should not be neglected. The heifer should be kept in a thrifty, growing condition and not be allowed to become stunted or on the other extreme to become too fat. The well grown-out heifer can be bred to freshen at an earlier date than if stunted.

**Winter feeding of heifers.** Consumption of large quantities of good hay or hay and succulent feed tends to develop barrel capacity in growing heifers. If properly developed to 1 year of age the yearling heifer will continue normal growth if she receives an ample amount of good quality alfalfa, clover, or oats and vetch hay. To grow normally she should consume daily  $2\frac{1}{2}$  to 3 pounds of very good quality hay per 100 pounds of body weight. Silage or root crops may be fed in place of part of the hay at the rate of 3 pounds per each pound of hay replaced. For the best results not more than one-third of the hay ration should be replaced by silage or other succulent feeds.

If the roughage available is of poor quality, enough grain should be fed to keep the animal growing. Usually 1 to 3 pounds of grain daily is required, depending on the amount of roughage consumed. Coarsely ground oats or a mixture of the farm grains is satisfactory for yearling heifers along with legume or mixed hay. If only grass or grain hay and succulent feeds are fed, 10 to 15 per cent of linseed oil meal should be added to the concentrate mixture. If silage, roots, or other succulent feeds make up a major part of the roughage ration, it is usually necessary to feed as much as 3 pounds of concentrates daily to enable the animal to make normal growth.

Regardless of the type of roughage fed, a plentiful supply of pure drinking water, salt, and sterilized bone meal should be available to growing heifers at all times.

**Summer feeding of heifers.** Good pasture will provide all of the protein and energy nutrients necessary for yearling heifers until about 3 months before they are due to calve. A good stand of irrigated pasture will supply plenty of feed throughout the summer. When dryland pasture is utilized, the condition of the heifer must be used as a guide in determining whether or not concentrates and hay should be fed. If the heifer tends to become thin and unthrifty in appearance, the pasture is not adequate and some supplementary feed should be given. Stunting the growth is very uneconomical because it will take more feed to develop a stunted heifer than it would to produce normal growth in the first place.

### SERVICE AGE

The time for first service of heifers depends upon their breed, age, size, and the season of the year when the owner desires to have them freshen. On the average, Jersey and Guernsey heifers mature 3 or 4 months earlier than Holstein heifers and can be bred to calve younger. In practice the size of the animal rather than her age should be the main guide in determining whether the heifer should be bred or not. On the average Jersey heifers making normal growth as indicated in the table on page 2 are ready to breed at 16 to 17 months of age. If the heifer reaches the normal size of a 16- to 17-month-old Jersey (about 61 inch chest girth or 640 pounds weight—table, page 2) 2 or 3 months earlier, however, she is large enough for service. If she is small for her age, service should be delayed. It is not desirable to breed animals at too young an age providing they are also small, because on calving they have the demands of lactation as well as growth. The result is a limited production of milk and butterfat, and usually a permanently undersized animal.

Ordinarily Guernsey heifers are well developed enough to breed at 17 months, Ayrshire heifers at about 18 months, and Holstein heifers at 19 to 20 months. As indicated for the Jersey example, however, if they reach the normal weights given for these ages as shown in the table at an earlier age they can be bred earlier. Or, if they are undersized at the age indicated, service should be delayed.

Under some systems of feeding and management it is economical to feed the heifer a larger proportion of the concentrate feeds in order that she may grow faster and be large enough to breed several months earlier. The additional feed cost is offset by the animal

becoming a producer at an earlier age. Growing the heifer out as rapidly as possible may be particularly profitable when labor costs are high, most feeds are purchased, pasture is not available, and the investment in buildings, equipment, and livestock is relatively large.

### FITTING FOR CALVING

About 3 months before the heifer is due to calve she should have an increased amount of feed in order to get her in good condition for freshening. If concentrate feeds are not already being given, their feeding should be started at this time. The proper guide as to the amount of concentrates to feed is the condition of the heifer. It is very desirable to have her carry a considerable amount of soft fat on the body at the time of calving. The heifer that calves in good condition will be a more profitable producer than the heifer that has been underfed. This is even more true than in the case of the mature cow because the heifer has the additional feed requirements for continued growth when in milk.

The actual amount of concentrates necessary will depend upon the quality of the roughage, but usually ranges between 4 and 8 pounds daily. A good fitting mixture consists of equal parts of ground or rolled oats, barley, and wheat. About 1 month before calving 10 per cent of linseed oil meal makes a desirable addition to the fitting mixture.

About a week before the heifer is due to calve the concentrate allowance should be reduced to 2 or 3 pounds daily. The heifer that runs with the dairy herd for 2 or 3 months before calving is much more easy to handle when she freshens.

### CARE OF THE COW AT CALVING

The heifer due to calve should be placed in a box stall, well bedded with about a foot of straw, during winter months, while during the summer she can either be allowed to calve in a box stall or in a small pasture lot near the barn.

During the calving interval the cow should be watched but left alone. Ordinarily the calf will be born in  $\frac{1}{2}$  hour. Usually the animal will calve without any assistance but this should be available if needed. After the calf is born the mother should be allowed to lick it dry.

Immediately following birth it is a good practice to apply tincture of iodine to the ruptured navel cord. This will tend to prevent navel infection or the entrance of bacteria into the calf's body. In case the cow is dirty, the flank, udder, and teats should be washed before the calf is allowed to nurse.



Under normal conditions the placenta or after-birth is expelled within a few hours after the calf is born, often almost immediately. The placenta should be removed from the stall to prevent the cow following her instinct and eating it.

Within a few hours after calving the cow should be offered slightly warmed water, and can be allowed all of the hay she wants at all times. A warm bran mash may be given the first day. She will do very well, however, if no concentrate is fed. On the second day she may be fed 2 to 3 pounds of a concentrate mixture. If no complications arise the amount may be gradually increased at the rate of about 1 pound daily until she receives the amount required according to the schedule recommended in Oregon Agricultural Experiment Station Bulletin 398, Feeding for Milk Production.

The amount of concentrates fed should be limited as long as there is considerable swelling in the udder. As this swelling reduces, the amount of feed can be increased. It is much better to go too slow in getting the cow on full feed than to go too fast and throw her completely off feed.

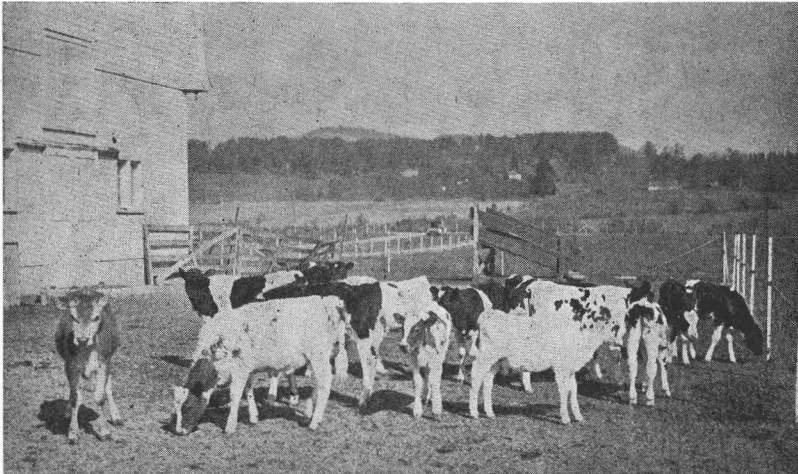
The cow should not be milked for the first 10 to 12 hours after calving, except as her milk is taken by the calf. After about 12 hours some of the milk should be removed from each quarter. On the second day about half the milk should be removed from each quarter, providing the animal seems to be getting along satisfactorily. On the third day somewhat more milk may be removed at each milking. On the fourth day and thereafter, if the cow is doing nicely, she should be milked dry at each milking. If there is any evidence of milk fever, milking should be discontinued and all feed taken away. Good producing animals are more apt to develop milk fever than poor producers. In case milk fever does develop a veterinarian should be called promptly to give the proper treatment.

If the cow's udder is very much inflamed it is desirable to milk the cow three times daily as well as to keep the grain allowance at a minimum. Congestion or caking in the udder will soon disappear with regular, normal milking.

## MANAGEMENT CONSIDERATIONS

**Stabling the heifer.** On being taken away from its mother the calf should be placed in a clean, well-bedded stall, preferably by itself, until 2 or 3 weeks of age. If several calves are kept in the same pen it is desirable to have stanchions or ties so that they can be kept apart for an hour or so after milk is fed. At this time they can be given their grain allowance.

After 6 months of age, a well-bedded shed, open on one side with mangers and racks for grain and hay, is entirely adequate for growing heifers during the winter months. Use of an open shed with ample ventilation results in more vigorous heifers than can be developed if they are too closely housed during the winter.



Calves should have sunshine whenever possible. Shade should be provided during the summer.

**Dehorning.** There is no logical reason for horns on cattle in the average dairy herd, and there are many reasons why they should be removed. Bad injuries are too common in herds where the animals retain their horns.

The best practice to follow is to prevent horn growth by applying caustic potash to the horn buttons on the calf. This should be done before the calf is a week old and preferably in the first 2 or 3 days of its life if the horn buttons are discernible. Caustic potash (potassium hydroxide) sticks can be purchased at almost any drug store. The sticks should be kept in a tightly corked bottle while not in use.

Before applying the caustic potash the hair growing over the rudimentary horn is clipped for an area of about 1 inch in diameter. A little vaseline or grease can be spread around the outer edge of this area to prevent the caustic from running into the eyes of the calf and causing blindness. The caustic stick is wrapped in paper to avoid burning the hands of the operator. The calf should be held securely during the application of the potash. Probably the best method is to lay the calf on its side with the head held firmly on the

ground. The exposed surface over the horn button is rubbed with the end of the caustic stick until the hair is removed and the skin becomes red, care being taken not to cause bleeding. The process is repeated with the other horn. When the correct amount of potash has been applied the skin will be softened and will shortly break and will have a burned appearance. It is not necessary to take off the entire horn button at the time of the operation as there will be a continued action of the caustic for some time, which will destroy the horn tissue cells. After application it is best to keep the animal tied and away from other calves, and particularly not to allow it to be exposed to rain, which would wash the caustic into the calf's eyes.

In case the horns are not prevented from growing by using caustic potash, they can be removed at a later age by the use of horn scoops or clippers or a handsaw. If a clipper, scoop, or saw is used, the horn should be removed with a fringe of hair to prevent the recurrence of horn growth. Such dehorning should be done during the colder months of the year in order to avoid contamination by flies with resulting infection. If dehorning is carried on during rainy months the animal should be kept out of the rain until the horn opening is healed.

**Marking for identification.** In connection with any dairy herd it is very desirable to develop a system of identification and to mark each individual calf shortly after birth in order that its true identity can always be determined.

The most highly recommended method of marking calves of the dairy breeds is tattooing in the ear. There are many tattooing outfits on the market and, if the directions for using these are carefully followed, excellent results will be obtained. Other methods of identification, such as ear tags, notching the ears, sketching, and photographing, may be used with considerable success, but for permanent identification tattooing in the ear is the most desirable method.

**Removing extra teats.** Many times the calf to be raised has extra teats on the udder that are unsightly when she comes into milk and may even be located in such a position as to interfere with milking. Extra teats can be easily removed while the heifer is still small and easy to handle. A simple method is to hold the calf securely, apply iodine to the extra teat, and clip it off with a clean, sharp scissors. The area is then covered with iodine. The operation is very simple if done early in the calf's life and apparently causes very little discomfort. If properly done there is seldom any bleeding.