

Raising Newborn Calves

F. Rulofson, M. Gamroth, and D. Hansen

There are several reasons for raising calves without their mothers. Occasionally, a cow dies giving birth or doesn't produce enough milk to support a growing calf. Some people buy calves to raise for beef and use grass grown on a few acres.

Where to Buy Calves

It is best to buy calves at the farm whenever possible. However, you can buy calves through dealers that pick up calves at the farm and deliver them to you. Experienced dealers know how to care for calves in transit.

Sale barns are the easiest markets for both the buyer and seller but can require extra care for the calves when you get them home. These calves are exposed to diseases and are under stress from being moved to and from the sale or auction. Care at the originating farm may have been less than desirable with calves sold through sale barns.

Feeding a Newborn Calf

The first and most important feed given a newborn calf is colostrum. Colostrum is made by the dam for about 3 to 7 days after she gives birth and is the calf's primary source of nutrition and fluids. It also provides essential antibodies that help the calf immediately fight off infectious diseases and nutritional deficiencies and gets your calf off to a good start.

The antibodies in colostrum are absorbed through the cells of the intestinal lining and into the bloodstream where they can effectively fight off disease. From birth to 6 hours, nearly

100 percent of the available antibodies are absorbed from the gut. After 6 hours, the absorption rate declines significantly, and by 24 hours very little antibody is absorbed.



Each calf should receive 8 to 10 percent of its body weight, about 1 gallon, of colostrum in the first 24 hours. Feed it from a single, clean nipple bottle. A calf needs 4 to 5 percent of its body weight in colostrum by the time it is 12 hours old and preferably within 1 to 2 hours. For an 85-pound calf, this means a minimum of 2 quarts (4 pints).

Continue feeding colostrum to the newborn through the first 3 days if colostrum is available. Even though antibodies are not absorbed, they can still protect the gut locally, which helps resist infectious scours.

If the calf refuses to suckle, the colostrum can be delivered through an esophageal feeder. The esophageal feeder consists of an esophageal probe, tube, clamp, and collapsible fluid container. The probe is a semi-flexible tube. It has a tear-drop-shaped end designed for easy insertion into the esophagus but not into the trachea (windpipe). When feeding is over, slowly remove the tube. Clean and sanitize the feeder and allow it to drain and dry.

This practice sometimes is called "tubing the calf" and may be the only way to feed a newborn calf. These slow-to-nurse calves should begin to drink or suckle normally in 3 or 4 days.

Frozen colostrum

The best substitute for natural mother's colostrum is colostrum from another cow. Periodically freezing high-quality colostrum ensures that you have

Franz. C. Rulofson, former Extension agent, Deschutes County; Michael J. Gamroth, Extension dairy specialist; and Donald E. Hansen, Extension veterinarian; Oregon State University.



some available the next time it's needed for a newborn calf. If you don't own a cow, colostrum may be available from a nearby dairy farm.

Colostrum should be frozen in small amounts for fast freezing and easy handling. Be careful when you thaw frozen colostrum. Studies show that rapid defrosting using boiling water or in a microwave at a setting above 60 percent power destroys part of the protein antibodies. Two methods are recommended:

1. Warm water thaw where 1 or 2 quarts of colostrum are immersed in 110°F water and stirred every 5 minutes to assure even thawing and warming. Continue the process until colostrum reaches about 104°F.
2. Use a microwave oven set at no more than 60 percent power. Again, agitate frequently to assure even thawing and warming. Stop when the colostrum reaches 104°F. Either process takes about 40 minutes.

Colostrum supplements

During the past years, several colostrum substitutes have been promoted for use in calves. These products are not adequate substitutes for cow colostrum. They are meant to be supplements for calves that already have received some natural colostrum.

Feeding Calves

In addition to colostrum fed at birth, calves need milk for the first 3 to 4 weeks of life. After that, they can digest vegetable starches and sugars. Further milk feeding is nutritious but may be more costly than feeding cereal grains.

There is a tendency to feed the baby calf too much and the older calf too little. *Whole milk or milk replacer should be fed at a rate of 8 to 10 percent of the calf's body weight for the first 4 weeks.* For example, 10 percent of an 85-pound calf is 8.5 pounds or 1 gallon.

All liquids should be fed at room or body temperature. This allows the calf to more easily regulate its body temperature and makes drinking or suckling

easier. While nipple bottles allow easier feeding with newborns, older calves easily learn to drink from a shallow bucket.

Milk replacers

Newborn calves lack sufficient enzymes to use such non-milk food-stuffs as grains, sugars, vegetables, and forages. Therefore, good milk replacers are made from dried milk and milk by-products such as skim milk, buttermilk or whey with animal or vegetable fats, antibiotics, vitamins, and minerals. Replacers can be fed as the only food following colostrum or with a good calf starter.

Different milk replacers are available. Base your choice of milk replacers primarily on quality rather than on price. Quality depends on the level and source of protein, fat, and carbohydrate. For most calves, 10 percent fat in the milk replacer is adequate. However, at 20 percent fat there is less diarrhea and faster growth in calves. Calves raised in cold environments grow better when fed replacers containing more fat (an energy source) during the winter months. Milk replacers should contain at least 20 percent protein when the protein is from milk products. When specially processed soy protein is used extensively, the protein level should be high (22 to 24 percent).

Milk replacers designed for calves more than 4 weeks old should not be used for younger calves. *Carefully follow the label directions on the replacer bag.*

How often to feed

Calves are fairly adaptable to a variety of management practices; however, successful calf feeding programs should be as consistent as possible day to day. While calves generally are fed two equal feedings per day, weak calves benefit from more frequent feeding of the same total amount. Single daily feedings may increase the incidence of scours because of the high intake of total solids during a single, short meal.

Clean feeding equipment

Thoroughly clean any utensils used to feed calves. Milk residue, colostrum, or replacer is a great growing ground for disease-causing bacteria. Play it safe and ensure minimum exposure by thoroughly cleaning and sanitizing all utensils used after each feeding. Store equipment in a clean, dry place.

Water is important

Make clean, fresh water available at all times. To prevent the calf from drinking too much water at one time, put the water in a different container and location than you used for milk feeding.

Calf starters

The first dry feed offered to calves is called "starter." Starter is a very palatable, coarse textured or pelleted concentrate or grain mix. It should contain 75 to 80 percent total daily nutritional requirements and 15 to 20 percent crude protein.

Calf starters should either be coarsely ground, rolled, or pelleted. If the starter is ground too fine, palatability and feed intake go down. Coarse, dry feed promotes development of the calf's first stomach, called the rumen, and provides nutrients for growth.

Teach your calf to eat dry feed as soon as possible. Place a small amount in its mouth after each milk feeding or place a small amount in the feed box to encourage your calf to eat. About ½ pint or ¼ pound of grain is all a small calf will eat each day. Increase the amount gradually as your calf is eating about 2 to 3 pounds of grain at 3 months of age and about 3 to 5 pounds of grain at 6 months of age (depending on the breed and condition of the calf).

Good calf starters contain adequate protein, vitamins, and minerals. You can purchase prepared calf starters from most feed dealers. Feed the starter according to recommendations on the container. A dairy cow grain mix with 16 percent protein is a good calf starter. It shouldn't contain protein or nitrogen from urea. Calves can't use urea until their rumen is completely developed.

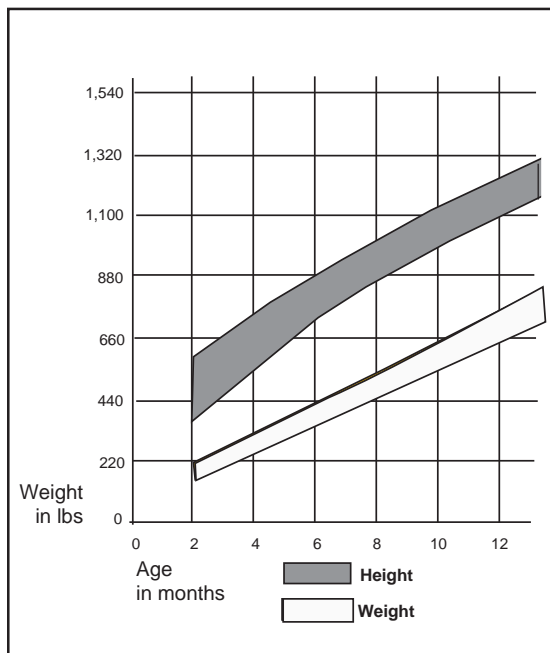


Figure 1.—Holstein calf growth chart. This chart covers from 0 through 12 months. (Adapted from *Management of Dairy Heifers*, Extension Circular 385, Pennsylvania State University, 1990).

Weaning

Calves can be weaned between 4 and 8 weeks of age. Wean calves when their starter intake is 1½ to 2 pounds per day. In some cases, calves must be maintained longer on liquid feed because of low grain intake. You can quit feeding milk as you wean as long as water is available. Calves receiving larger amounts of liquid feed can be weaned gradually to reduce trauma. In general, early weaning reduces feed and labor costs.

Calves should consume some high protein hay for at least a week before they are weaned. The growth and development of the rumen as well as the nutritional requirements of young calves depend mostly on grains but also on forages.

As calves mature, decrease or increase the amount of grain you feed them to meet the desired weight gain and the relative prices of grain and roughages.

After weaning

From weaning to 3 months, you can gradually raise to 6 pounds the level of calf starter you feed a growing calf. High-quality hay should be available for calves to eat all day (called “free

choice”). You can feed up to 3 percent of the calf’s body weight of higher moisture feeds like silage, green chop, and pasture.

Take care to avoid feeding too much of these forages since they can limit overall nutrient intake and result in poor growth, scours, and “pot-bellied” calves. By 3 months, the rumen should be almost fully developed, and you can replace the calf starter with less expensive “grower” grain mixes.

Monitor Calf Growth

Check weight gains to determine whether calves are growing at the desired rate. Periodically checking calf weight and height also helps you evaluate your feeding program. Also observe body condition and skeletal growth. Over-conditioned or fat calves may be receiving too much feed or the ration may be low in protein. Lack of condition or skinny calves indicates underfeeding or poor-quality feed.

If you don’t have access to scales for weighing your calf, a weighing tape will estimate its weight accurately. You may be able to get a tape from your feed dealer or borrow one from your local county office of the OSU Extension Service.

To estimate weight, place the tape around the calf’s body directly behind the front legs (the heart girth). Make sure the calf is standing squarely on its feet. Have the tape fit firmly but not tight. Then read the weight directly from the tape. Figure 1 shows typical height and weight growth for a Holstein calf.

Adequate Housing is Important

Keep calves in individual pens until they reach weaning age. Separate pens prevent the calves from suckling one another and reduce the spread of calf disease.

Calf pens must be clean, dry, and properly ventilated. Any housing that meets those standards is acceptable. Preferably arrange to use barns or pens that can be emptied completely for brief periods before starting more calves. After a calf is removed, clean and sanitize the entire pen to prepare for another calf.

Ventilation should provide fresh air at all times without drafts blowing directly on the calves. An ammonia smell indicates more fresh air is needed. Allow more air into the area through broad, continuous openings in the barn or hutch to prevent drafts.

Calf housing should be bedded to keep the calves comfortable and dry. Sawdust or straw is most commonly used. If the base under the bedding allows drainage, you can simply add bedding every few days to provide a dry bed for your calves. If the base is concrete or some other solid material, you need to remove the soiled, wet bedding at least weekly and replenish it with clean bedding. You may want to plan for an extra pen in this case to confine the calf while you clean its pen.

Outdoor calf pens must be partially covered and walled to prevent excessive heat caused by the sun and to guard against cold winter rains and wind. Pens open to the east gain warmth from the morning sun and provide shade during the warmer parts of the day. Rain seldom falls from the east.

Housing calves individually allows you to watch the calf’s daily feed intake and monitor it for diarrhea (also called scours).

Keep Calves Healthy

Preventing disease in newborn calves gets them off to a good start, reduces death losses, and is cheaper than treating sick animals. Observe calves regularly, feed them correctly, and provide clean surroundings.

Regular use of a rectal thermometer helps detect sick calves with fevers early. Normal body temperature is 101.5°F. Early detection is essential for effective treatment.

Seek advice from your local veterinarian in planning your disease prevention and treatment program. The veterinarian knows the diseases most prevalent in your area, appropriate vaccinations, and will prescribe proper care and use of drugs. Your veterinarian may give advice by phone at minimal cost. Calf raisers should not vaccinate or treat calves without a veterinarian's guidance.

Calf scours

It sometimes is difficult to distinguish scours caused by infection organisms from scours caused by other factors such as overfeeding, irregular feeding, or rapid changes in feed. Infection scours usually affects several calves with foul smelling diarrhea, and some animals may die quickly.

Quick treatment necessary

By far, the most important treatment for scours is replenishment of vital fluids and electrolytes. Numerous powdered formulas are available commercially that help return fluids into the calf that are lost in the diarrhea. You should keep a supply on hand to meet a scours problem. Consult your veterinarian for the best product and for the amount of mixture you need to give sick calves.

For more information about calf scours, call or visit your local county office of the OSU Extension Service or your local veterinarian.

Table 1.—Example costs for a farm-raised calf.

Age	Item	Amount	Costs
Birth to 2 months			
	Milk replacer	50 lb	\$34.00
	Calf starter grain	100 lb at \$200/ton	\$10.00
	Alfalfa hay	30 lb at \$130/ton	\$1.95
	Veterinary care and medicine		\$10.00
	Buildings, pens, equipment, bedding		\$9.00
	Calf cost		\$80.00
	Death loss	10 percent	\$11.25
			Total cost to 2 months
			\$156.20
3 to 17 months			
	Grain	1,250 lb at \$185/ton	\$115.63
	Hay	3,500 lb at \$90/ton	\$157.50
	Pasture	10 months at \$12/month	\$120.00
	Minerals and salt		\$10.00
	Veterinary care and medicine		\$10.00
	Death loss	2.0 percent	\$8.86
			Total cost (3–17 months)
			\$421.98
			Total cost (0–17 months)
			\$578.18

Costs Involved

Table 1 shows the approximate costs involved in raising a calf from birth to 17 months of age. As you can see, there is a lot involved in raising calves. General costs are listed in the table. There is the initial cost of the calf and additional costs in feed, housing, bedding, and medication. Costs vary from farm to farm.

Related OSU Extension Publications

Hansen, D., *Prevention and Treatment of calf scours*, EM 8513 (1992). No charge.

Stoddard, G., *Dairy calf housing*, WREP 38 (Reprinted 1995). No charge.

Fiez, E.A., and G. Cleveland, *The calf and yearling in 4-H dairying*, PNW 78 (Reprinted 1996). \$1.50

To order copies of the above publications, send the publication's complete title and series number, along with a check or money order for the amount listed (payable to Oregon State University), to:

Publication Orders
Extension & Station Communications
Oregon State University
422 Kerr Administration
Corvallis, OR 97331-2119
Fax: 541-737-0817

If you would like additional copies of this publication, *Raising Newborn Calves*, EC 1418, send \$1.00 per copy to the above address.

We offer discounts on orders of 100 or more copies of a single title. Please call 541-737-2513 for price quotes. You may order up to six no-charge publications without charge. If you request seven or more no-charge publications, include 25 cents for each publication beyond six.

Produced and distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914. Extension work is a cooperative program of Oregon State University, the U.S. Department of Agriculture, and Oregon counties. Oregon State University Extension Service offers educational programs, activities, and materials—without regard to race, color, religion, sex, sexual orientation, national origin, age, marital status, disability, and disabled veteran or Vietnam-era veteran status—as required by Title VI of the Civil Rights Act of 1964, Title IX of the Education Amendments of 1972, and Section 504 of the Rehabilitation Act of 1973. Oregon State University Extension Service is an Equal Opportunity Employer.

Published January 1993. Reprinted June 1998.

