

Caring for Newborn Beef Calves Separated from Their Dams



Calves that are orphaned or abandoned at a very young age present a unique set of challenges on a cow-calf operation. These situations arise not only from dams dying at or shortly after birth, but also from behavioral or health issues that keep a cow or first-calf heifer from properly mothering her calf. Calves out of cows producing insufficient milk or born as multiples may need to be raised with special attention. In the dairy industry, calves are routinely separated from their dams at very young ages. The resulting calves are sometimes referred to as “bucket” or “bottle” calves.

Initial Calf Care Priorities

Colostrum Intake

The first priority in caring for a bottle calf is to ensure adequate colostrum intake. Timing of colostrum intake is particularly important, because the calf’s ability to absorb colostrum antibodies decreases rapidly throughout the first day of life. Plan for calves to receive 5 to 6 percent of their body weight in colostrum within the first 6 hours after birth. Feed colostrum again 12 hours later. To ensure proper timing of these feedings, calving herds must be watched closely for new births. Observe newborn calves

within the first few hours of life to ensure that they nurse their dams. If dams refuse to allow their calves to nurse or are physically unable to allow nursing, take immediate action to provide colostrum to newborns.

Fresh colostrum from the dam is best and may require restraining and milking the dam or allowing the calf to nurse the restrained dam. This can be accomplished in a squeeze chute with removable sides that allow access to the udder. In the case of orphaned calves, providing colostrum from another source is critical. If fresh colostrum is not available, then the preferred source of colostrum is frozen colostrum previously harvested from within the same herd. The next-best option is frozen colostrum from another herd. When neither fresh nor frozen colostrum is available, then substitute commercially available powdered colostrum. Have colostrum and newborn feeding supplies on hand before the start of the calving season. Otherwise, it may be difficult to acquire and administer colostrum in a timely manner.

Naval Care

Naval care is another calving management practice that should receive priority. Apply iodine or a similar topical disinfectant to the umbilical cord of the newborn calf. Continue to observe the naval closely to make sure that it dries and heals. Watch for signs of naval ill or infection, such as swelling of the naval. These infections are more likely in muddy or wet calving areas. Naval ill can develop even when the naval is disinfected shortly after birth and ground conditions are dry. An infected naval typically appears swollen and may be painful to the touch. Treat an infected naval immediately. Consult a veterinarian for treatment protocols.

Protection

Provide calves with clean, well-ventilated pens and shelter from the weather. Calf hutches can be purchased or barn pens used to house bottle calves. Individual penning can help prevent calves from sucking one another and

reduce the spread of disease. It also facilitates individual monitoring of calf feed intake and feces consistency as signs of calf health. Allow 15 to 20 square feet of barn space for calves with access to an outdoor lot and 20 to 30 square feet of barn space for those without outdoor lots. Mississippi State University Extension Publication 2558 *Beef Cattle Calving Management* provides additional details about processing newborn beef calves.

Very young calves raised on bottle or bucket feedings are generally more vulnerable to predators than heavier, older cattle. Without the close connection to a dam in the herd, bottle or bucket calves may separate themselves from the herd on a frequent basis. This leaves them vulnerable to predator attacks, and predators may be particularly attracted to the herd during calving season with the presence of afterbirth and new calves. Consider penning bottle calves in a more protected area such as a well-fenced pen with a mature cow until they grow to a size and thriftiness that allows them to better escape from or defend against predators. Extension Publication 2661 *Predator Control on Beef Cattle Operations* provides more information on this topic.

Feeding the Young Calf

For the first few months of life, bottle calves must be either artificially reared by humans on milk replacer diets or grafted onto nurse animals. These young calves are not yet mature ruminants, so they need a milk-based diet. A calf needs to consume approximately 8 percent of its birth weight in milk or milk replacer each day. Offer bottles twice daily in two equal feedings. Follow feeding directions on product labels. As the calf grows, keep the amount of milk replacer constant, but also offer calf starter feeds and good quality hay as its appetite increases. Make clean water available for the calf, as well.

Grafting to a Nurse Cow

Successful grafting of a calf onto the side of a lactating cow eliminates the labor and expense of bottle feeding. Besides providing a milk source for the calf, it also gives the calf protection from predators. Grafting a calf onto a beef cow that has lost her calf or another nurse cow (often a dairy breed) purchased specifically for such use requires management and patience. Grafting may also be needed in cases in which the dam initially refuses to allow her own calf to nurse. This may be more common in females that calved for the first time or dams that gave birth to multiples.

Start by penning lactating cows and newborn calves separately from the rest of the herd in a space that allows the calf to interact closely with the cow to which grafting

is being attempted. Provide adequate shade and water in the pen, along with forages or other feedstuffs for the cow. For best results when introducing the cow and calf, do not bottle feed the calf to satiation immediately before trying to get it to suckle the prospective nurse cow. A tight-bagged (full-uddered) cow and a hungry calf are more likely to result in successful grafting.

When applicable, rub or tie the skinned hide (skin over the back along with the tail) of the nurse cow's dead calf onto the grafted calf to transfer scent and encourage the cow to accept the new calf. Afterbirth and commercial products consisting of synthetic pheromones also can help in grafting. Using these scents may be helpful during the first 2 to 3 days but not much after that period.

The cow and calf may be too distracted by human presence to nurse or bond when first introduced. Allow them time alone together without distraction, and then either observe them at a distance undetected or check them later for signs of nursing, including a full belly on the calf and slick teats or reduced udder filling on the cow.

Initially give the nurse female an opportunity to accept the calf without restraint, but do not wait too long for nursing to occur before relying on restraint. It is critical that newborn calves receive adequate colostrum and nutrients in early life. Also, dehydration is a risk that must be addressed through forced feeding situations if necessary. If the cow repeatedly kicks at or butts the calf and does not allow it to nurse when unrestrained, physically restrain the nurse cow in a squeeze chute with the bottom sides removed so the calf can nurse twice a day. Repeat until the cow claims the calf willingly.

If the nurse female has undergone a difficult birth or is stressed from losing her calf, use extra care in handling her, and observe her closely for signs of distress or health problems. It is possible that even when a nurse female accepts a grafted calf, she may not lactate well enough to support the calf. In some cases, the cow may dry off (discontinue lactation). Do not assume that a suckling calf is getting adequate nutrients through nursing. Closely monitor the calf's weight and condition, and supplement additional nutrients as needed.

Milk Replacer Diet

In the absence of a nurse cow, use a milk replacer that contains at least 22 percent crude protein and 15 percent fat. Mix milk replacer with warm water to better dissolve the product and make it more attractive to the calf. If a hot water source is not available close to the feeding site, use a thermos or other insulated container to transport warm water to the feeding site. Then, mix the warm water and milk replacer powder together when ready to feed the

bottle. Keep the temperature of the mix consistent between feedings and not more than 100°Fahrenheit. Also, use the same amount of milk replacer in the mix each feeding. Be sure to thoroughly mix the powder and water by stirring or shaking to dissolve all of the powder into the mixture.

Use separate bottles for each bottle calf to limit risk of disease spread. Sanitize all feeding equipment after each meal. To protect human health, particularly that of susceptible young children, keep bottle feeding supplies out of human food preparation areas.

Although a calf may instinctively nurse its mother, it may need to be taught to drink from a bottle. Start by inserting one or two fingers into the calf's mouth. As the calf begins to suck, insert the bottle nipple in its mouth. It may be necessary to straddle or stand beside the standing calf and support its head upward while the calf is backed against a solid fence, wall (corner is best), or vehicle. This head position will also help close the esophageal groove present in young calves and shunt milk past the rumen and directly to the abomasum ("true stomach") instead.

It may take a while to get lethargic or ill calves to actively suck a bottle. When possible, spend the additional time to get a calf started on a bottle before resorting to a forced infusion of feeding liquid. But, if a calf still refuses to take a bottle, a stomach tube (**Figure 1**), also known as an esophageal feeder, can be used to infuse milk replacer directly to the calf's stomach. Take extreme care to ensure that the tube is in the esophagus and not the windpipe. Listen to make sure that breathing sounds are not coming from the tube. Sometimes, infusion of milk replacer into the stomach will stimulate a calf's appetite. Weak calves may require smaller and more frequent feedings. Continue to monitor calves for signs of unthriftiness such as poor growth, scours, and a "pot-bellied" appearance. Have a scours prevention and treatment plan in place based on the advice of a veterinarian familiar with the operation. Extension Publication 2551 *Identifying Sick or Injured Cattle* provides additional insight about monitoring calves for illness.



Figure 1. Stomach tube.

As calves become used to drinking from a bottle twice a day, they may anticipate feedings and aggressively pursue the bottle. These calves become accustomed to humans feeding them. Although bottle calves are often considered tame or docile, the bottle handler needs to be careful of being head butted by the calf. This becomes more of a safety concern as the calf gains stature and weight over time. A wire bottle holder can be used to attach a filled bottle to a fence to keep the handler from having to hold the bottle during feeding. Be sure to remove the bottle from the calf when emptied to prevent the calf from sucking excess air into its gut.

Bucket feeding of milk replacer is also possible, but take precautions to keep calves from stepping in and knocking over buckets. Make sure that buckets are not too tall for calves and are secured. To teach bucket feeding, place fingers moistened with milk into the calf's mouth as described earlier. As the calf begins to suck, gently lower its mouth into the bucket of warm milk. Keep its nostrils clear of the liquid. Repeat as needed until the calf drinks on its own.

Transition to Solid Feeds

By 3 weeks of age, calves should be able to digest small amounts of solid feeds. Make sure feeders are not so high or deep as to be difficult for calves to reach the feed. Calf starter feeds should be dust-free, highly palatable feeds containing 75 to 80 percent total digestible nutrients (TDN), 15 to 20 percent crude protein, and adequate minerals and vitamins. They should be coarsely ground, rolled, or pelleted to facilitate feed intake and rumen development. Calves can be adapted from starter to grower rations at around 4 months of age.

After the calf finishes each milk replacer meal, place a small amount of solid feed in its mouth to encourage feed tasting. Keep small amounts of dry, fresh feed in a feed box or tub in the calf's pen. At first, calves will consume only about a fourth of a pound of grain per day. This will increase to about 2 to 3 pounds of starter feed by 3 months of age and approximately 3 to 5 pounds of feed at 6 months of age. Do not feed more than a calf will clean up in a day to avoid leaving stale or moldy feed.

Hay or pasture consumption encourages rumen development. Hay should be high quality and offered free choice. Provide limited exposure to green pasture, greenchop, or silage until calves are 6 months of age, because excessive feeding of these high-moisture forages to young calves can limit dry matter and nutrient intake.

Weaning Young Calves

Calves can be weaned at 4 to 8 weeks of age if eating well (1½ to 2 pounds of starter feed daily). Wait longer to wean less vigorous calves or calves that still have low grain intake. Extension Publication 2555 *Early Weaning Beef Calves* provides detailed information on this topic. Gradual weaning reduces calf stress as discussed further in Extension Publication 2578 *Beef Calf Preconditioning Programs*. Do not change up other aspects of the calf's routine when weaning a young calf from milk.

Make sure that weaning records reflect the correct contemporary group status of the calf. It is not fair to compare weaning weights for an orphan calf receiving milk replacer to those of other calves raised by their own dams. Most breed associations have special weaning codes to account for this.

Conclusion

Raising a bottle calf requires patience and attention to care. It may take several days or even weeks of good management to get a bottle calf well on its way to surviving on its own. Close management of calf nutrition and health are keys to successfully raising a bottle calf. For more information about beef cattle production, contact your local county MSU Extension office or visit <http://extension.msstate.edu/agriculture/livestock/beef>.

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