

Calf hutches that are well bedded and properly sited provide the ideal housing for calves. They are easy to clean and can be moved after each calf. Most calf hutch designs also provide for excellent ventilation and air exchange. It is extremely difficult to properly ventilate an enclosed area in which calves are housed, such as a calf barn or greenhouse. Usually the incidences of scours and respiratory diseases are higher when calf housing is enclosed.

Comfort

Calves need to be kept comfortable. Provide plenty of dry bedding and shelter from drafts and wind. This is especially important during cold weather. In bitter weather, calf coats can help maintain a calf's body heat by providing protection from the wind and cold.

Consistency

Consistency of newborn protocols and daily calf management is important. Calves should be fed the proper amounts of the same feeds at the same temperature every day. Calves should be observed at the same times every day. Calf management work should be handled by the same person(s) every day. Changes in the routine will stress calves, and animals that are stressed are more likely to get sick.

Implementing the 5 C's requires a plan.

Consult your veterinarian on the most effective way you can implement the 5 C's to help prevent disease in the calf herd and give your calves a healthy start!

- ▶ **Colostrum**
- ▶ **Calories**
- ▶ **Cleanliness**
- ▶ **Comfort**
- ▶ **Consistency**

Johne's Disease and Calves

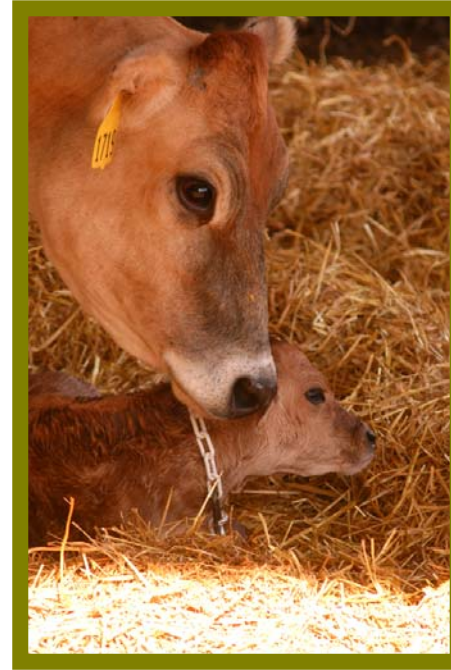
Dairy animals infected with *M. paratuberculosis* usually acquire it as calves. Johne's disease is transmitted when calves ingest fecal-contaminated milk or colostrum. You can reduce the risk of animals developing the disease by focusing on newborn calf management. Calves should:

- Be born in a CLEAN environment.
- Only receive clean colostrum from animals that test negative for Johne's disease.
- Be moved out of the maternity area as soon as possible (within an hour).
- Be housed separately from adult animals.

Newborn Protocol

1. Clean hands, arms and equipment if assisting the calving.
2. Remove mucus from the calf's mouth and nose.
3. Rub the calf vigorously if stimulation is necessary.
4. Examine the navel and place a tie around the stalk if it is still bleeding or more than 2" in diameter.
5. Apply disinfectant to a clean navel. Iodine solutions (1, 2 and 7%) or chlorhexidine (0.5%) may be effective.
6. Feed 3-4 quarts of clean colostrum to the calf as soon possible; use either a bottle or esophageal tube feeder. Do not let the calf nurse.
7. Identify the calf.
8. Move the calf as soon as possible to a hutch or into the calf housing area. Do not move the calf again until after it is weaned.

Raising Calves...



The 5 C's of a Healthy Start

Your guide to creating a healthier herd and a healthier income through good calf management.

Raising healthy calves is a challenging and rewarding job. Calf raisers are responsible for the dairy herd's future – the next generation of milk cows. Minimizing death and disease losses in the calf herd can save hundreds of dollars per replacement animal raised. Some farms battle continually against disease and death in their calves, while other farms have no problems. What are the keys to a successful calf program? What does it take to raise healthy calves?

The five C's of a healthy start are:

- **Colostrum**
- **Calories**
- **Cleanliness**
- **Comfort**
- **Consistency**

Colostrum

What is it?

Colostrum is the first secretion produced by the mammary gland after parturition, or calving. It is a rich and concentrated source of nutrients for the calf.

Good-quality colostrum is thick and creamy in appearance. Healthy cows in good condition that have been vaccinated against rotavirus, coronavirus and *E. coli* bacteria are more likely to produce good-quality colostrum.

Inferior colostrum can result when cows are dry less than four weeks, when animals are milked before calving, and when animals are first-calf heifers. Thin or watery colostrum should not be fed if there is a source of good-quality colostrum available, either frozen or fresh.

Why is colostrum important to calves?

- Colostrum contains high levels of antibodies that calves need to prevent diseases caused by organisms present on most dairy farms (see Chart One for a list of these diseases). Calves are born with few antibodies of their own and an immature immune system that is not capable of producing antibodies for some weeks. Colostrum provides the needed disease-fighting antibodies.
- Colostrum is a nutrient-rich first meal for the calf. Chart Two details the nutritional differences between colostrum and milk. Colostrum is high in protein, energy (fat) and vitamins.

Chart Two

Nutrient composition of colostrum compared to whole milk

Nutrient	Colostrum	Milk
Total Solids (%)	23.9	12.5
Total Protein (%)	14.0	3.2
Immunoglobulins (%)	6.0	.1
Casein (%)	4.8	2.5
Fat (%)	6.7	3.6
Lactose (%)	2.7	4.9
Vitamin A (mg/100 ml)	295.0	34.0
Vitamin E (mg/g fat)	84.0	25.0

to ensure that all calves are fed colostrum within the first six hours. When calves are unable to drink all the colostrum, use an esophageal tube feeder. A second meal of colostrum is not necessary for calves that suckle three quarts or receive all four quarts of colostrum by an esophageal feeder at the first meal.

Colostrum should not be pooled unless cows have tested negative for Johne's disease, persistent infection with bovine viral diarrhea (BVD) and bovine leukosis virus (BLV). Why? Animals that test positive for these diseases may pass them on to calves through their colostrum and milk. When an older test-negative cow produces more colostrum than is needed for the first two feedings of her own calf, the extra colostrum may be frozen for use later.

Chart One

Micro-organisms commonly present on dairy farms that cause scours or pneumonia

Cause Calf Scours	Cause Calf Pneumonia
Bacteria: <i>E. coli</i> <i>Salmonella</i> <i>Clostridium</i>	Bacteria: <i>Pasteurella</i> <i>Histophilus</i> <i>Arcanobacterium</i> <i>Mannheimia</i> <i>Mycoplasma</i>
Viruses: Rotavirus Coronavirus BVD	Viruses: IBR BVD PI3 BRSV
Parasites: Cryptosporidia Coccidia	

When should colostrum be fed?

Feed colostrum as soon as possible after birth, ideally within one hour. The calf is capable of absorbing the antibodies in the colostrum for only the first 24 hours after birth. With each passing hour after birth, the calf's ability to absorb the antibodies decreases.

How should colostrum be fed?

Wash the cow's teats and udder, and milk four quarts into a clean bucket. Feed 3-4 quarts of good-quality colostrum to the calf within the first hour of life. Although it may not always be possible to feed every calf colostrum in the first hour of its life, strive

Calories

After the first day of life, begin feeding calves a sufficient quantity of high-quality milk replacer or pasteurized milk at least twice a day. Due to the possibility of passing diseases from adult animals to calves, it is not recommended to feed non-saleable milk that has not been pasteurized. Generally with milk replacers, you get what you pay for. Or in other words, as price increases, so does quality. Feed two quarts of milk replacer twice a day that is mixed according to the manufacturer's instructions. Increase the number of feedings or enhance the caloric intake of calves in cold weather.

Begin offering a small amount (a handful) of high-quality calf starter on the second day of life. Adjust the feeding rate in 0.5 lb. increments. Discard refused and add fresh starter daily.

High-quality calf starter is palatable, high in protein (18-20 percent), high in energy and low in fiber. Why do we offer calf starter to calves so soon? Calves will nibble on the starter and, within a few days, begin to eat small amounts. It is important they do this because the calf starter stimulates the development of the rumen. Calves need to be eating at least two pounds of calf starter daily before they are weaned at five to eight weeks of age.

In cold weather, calves require more energy to produce additional body heat. When temperatures drop below freezing, increase the milk replacer fed per day by adding an additional feeding. And when temperatures fall below 0° F, increase the milk replacer fed per day by adding two extra feedings. If additional feedings are not possible in cold weather, more milk can be fed at the other two feedings.

Water does not contain calories, but research has shown calves will eat more calf starter, gain weight faster, and scour less often if they have fresh water available to drink at all times. In cold weather, continue to feed warm water after feeding milk but empty the water buckets before the water freezes.

Cleanliness

Keeping the calf environment clean is important. Calves should be born in a clean, dry place. Maternity areas must be kept very clean and as free of manure as possible. If these areas are dirty, newborn calves will be exposed to a variety of disease-causing organisms, such as *E. coli*, *Salmonella*, and *Mycobacterium paratuberculosis* (Johne's disease). The outcome will be more sickness and a higher death loss in the calf herd. Apply these basic hygiene and sanitation principles to keep calves healthy and disease-free.

- Keep calves away from adult animals (in hutches or in a separate facility).
- House calves in individual hutches, stalls or pens until after weaning. Bedding should be deep enough to cover the calf's legs when lying down.
- Provide good ventilation and a draft-free environment. Solid partitions that prevent contact between calves prevents disease, but keep the front, back and top of individual pens as open as possible for the best air quality.
- Locate calf housing upwind, uphill and upstream from adult cattle so any manure runoff from adult animals will not reach the calves.
- Clean, wash, disinfect and dry out hutches, stalls or pens between calves.
- Prevent manure contamination of feed, feed area and feeding utensils (make sure boots, handtools, skid steers and equipment are clean). Baby calves should never be in contact with manure from adult animals.
- Work from youngest to oldest animals when doing chores.
- Provide individual feed and water pails for each calf and keep them separate.
- Wash and sanitize shared milk pails and bottles between feedings.
- Provide fresh calf starter, milk replacer and water every day. Discard refused feed away from the calf housing area.

Freezing/Thawing Colostrum

When an older, test-negative cow produces more high-quality colostrum than is needed, the additional colostrum should be frozen. Here are some tips on using the extra colostrum:

- Freeze one or two quarts at a time in quart or gallon freezer bags. Label bags with the date and cow's number. After filling and sealing bags, store them flat in the freezer.
- Thaw the colostrum gradually in a pail of warm water or use the microwave on the defrost setting. (Do NOT let hot spots develop during microwaving. If colostrum gets hot, the disease-protecting antibodies will be destroyed.)

Calves with high immune levels save the dairy up to \$25 each in feed and health costs.