

Feeding Dairy Heifers from Birth to Weaning¹

Dr. Brinton A. Hopkins and Dr. Lon W. Whitlow
Dairy Nutrition Extension Specialists

Introduction

Two years from now, your newborn heifer calves should enter the milking herd. At that time, you will depend on them for income. To assure they become sound, profitable producers, give calves and heifers proper care and feeding. It is important to evaluate your dairy replacement program and make sound feeding and management decisions in order to minimize current expenses and also to ensure future success based on superior replacement animals.

From Birth to Weaning

The period from birth to weaning is critical in the life of growing dairy heifers. Through proper feeding and management, you can minimize mortality rates and feed costs while maintaining good growth and performance.

Reduce Calf Death Losses

On many North Carolina dairy farms, more than 10 percent of calves die before they are a year old. Check your records

to see how your operation compares with this state average. A goal is to have a calf death loss rate of less than 5 percent. You can achieve this goal by reducing stress on the animals, controlling disease, and feeding and managing the animals properly.

Colostrum Provides Passive Immunity to Calves

At birth, a calf has little or no immunity to disease. The calf gets this immunity from absorbing immunoglobulin (antibodies) found in the colostrum. Immunoglobulin is a protein transferred from the blood of the dam to the colostrum during the dry period. Consequently, short dry periods can reduce the antibodies in the colostrum. Immunoglobulin levels are highest in the first milk after calving and decline thereafter. Colostrum from older cows has more immunoglobulin because older cows have been exposed to more diseases and have had the opportunity to develop antibodies against these disease organisms.

¹ Reviewed by: Dr. Vivek Fellner (Department of Animal Science, NC State), Sheila Jordan (N.C. Department of Agriculture & Consumer Services), Nancy Keith (N.C. Cooperative Extension Service), Tony McGaha (N.C. CES), and Ken Vaughn (N.C. CES).



Feed Adequate Colostrum Within the First 30 Minutes

Newborn calves absorb colostral immunoglobulin through the wall of the small intestine. This absorption is time dependent. It is very good immediately following birth, but declines until the intestinal wall closes to the transfer of these large proteins about 24 hours later. Therefore, it is extremely important to feed an adequate amount of colostrum as soon as possible, preferably within the first 15 to 30 minutes of life. In a research study (1991. *JAVMA* 198:419-422), 89 percent of calves force-fed with an esophageal feeder acquired immunity, while only 39 percent of those that nursed became immune. When calves were fed colostrum with a nipple bottle, 81 percent became immune. A research study conducted in North Carolina and Tennessee (1997. *J. of Dairy Sci.* 979-983) compared the practice of feeding 1 gallon of colostrum in one feeding shortly after birth with the standard practice of feeding $\frac{1}{2}$ gallon at each of two feedings. The results indicated that feeding calves 1 gallon of colostrum initially does provide passive immunity to the calf.

To be certain the calf receives enough colostrum within this critical period following birth, the colostrum should be fed using a nipple bottle or an esophageal feeder. Newborn Holstein calves should receive 1 gallon of colostrum as soon after birth as possible. This amount is about 10 percent of their birth weight. Calves from smaller breeds should be fed accordingly.

Whole Milk

Whole milk should also be fed at a rate of 10 percent of birth weight daily, which would be about 1 gallon per day for Holsteins and slightly less for calves from smaller breeds. (Milk weighs 8.6 pounds per gallon.) Waste milk and excess colostrum can be used to reduce feed costs. Be sure to thoroughly clean and sanitize all feeding utensils, bottles, and buckets, etc., to minimize digestive upsets and to control the spread of disease.

Pasteurize Waste Milk before Feeding

If economically feasible, pasteurize waste milk to destroy pathogens before feeding it to calves. Research has shown that calves fed pasteurized milk are healthier and gain better than calves fed milk that was not pasteurized. Research has also shown that pasteurization of milk in a continuous flow (turbulent) pasteurizer will kill *Mycobacterium paratuberculosis*, which is the bacteria that causes Johnes disease.

Milk Replacer

Milk replacer can be fed instead of whole milk. The choice should depend on the cost of the milk replacer and the price received for milk.

Generally, most milk replacers will replace whole milk at the rate of 1 pound of dry milk replacer for every 6 pounds of whole milk. For example, if milk is valued at \$13.00 per hundred-weight or 13 cents per pound, then milk replacer should cost less than 78 cents per pound to be economical to use. Milk replacer should contain at least 20 to 22 percent crude protein and 15 to 20 percent fat. For best results, the protein should be provided from milk sources, although acceptable results have been obtained using some alternate sources.

Once-Daily Milk Feeding

For the past several years, calves at the N.C. Department of Agriculture & Consumer Services' Piedmont Research Station near Salisbury, N.C. have been fed 1 gallon of milk once daily with excellent results. The calves stay healthy and grow well. This practice saves a tremendous amount of time and labor.



Early Weaning

Whole milk or milk replacer should be fed for 4 to 8 weeks until the calf consumes at least 2.0 pounds of a high quality calf starter concentrate mix daily for 3 consecutive days. A research study conducted at the Piedmont Research Station (1997. *J. of Dairy Sci.* 80:2200-2203) found that calves weaned at 28 days of age and those weaned at 56 days of age had similar body weights and wither heights by the time they reached 90 days of age. Calves that are weaned early also eat more calf starter and cost less to raise. A good recommendation is to wean calves at 6 weeks instead of 8 weeks of age. By weaning early you will save 2 weeks of feeding milk to the calves, and they will consume more calf starter.

Calf Starter Mix

You should feed a high quality calf starter that contains 18 to 22 percent crude protein and about 80 percent total digestible nutrients (TDN). Several excellent calf starters are available commercially. This starter must be palatable to encourage intake and should contain a coccidiostat such as Deccox®, Bovatec®, or Rumensin®. The grains included in the calf starter should be coarsely ground, cracked, or rolled to increase palatability and stimulate rumen development. Continue feeding calf starter until the calves consume 4 to 5 pounds daily. Then begin feeding a less expensive calf grower or formulate a total mixed ration (TMR) for the heifers.

Hay

Pre-weaned calves do not need hay. It is better for calves to receive their nutrients from milk and a high quality calf starter. The calf starter will ferment in the rumen, producing volatile fatty acids that will stimulate rumen papillae development. In addition, since dry matter intake is low in calves, they receive more nutrients from eating calf starter than hay. Once the calf is weaned, you should feed high quality hay or a heifer TMR that contains cottonseed hulls.

Recommendations

- Feed 1 gallon of colostrum as soon after birth as possible.
- Feed 1 gallon of milk once daily. This practice is effective and saves time and labor.
- If economically feasible, pasteurize waste milk before feeding it.
- Feed a high quality calf starter that contains a coccidiostat while the calf receives milk and after weaning until the calf consumes 4 to 5 pounds daily. Then change to a calf grower ration or a heifer TMR that contains cottonseed hulls.
- Do not feed hay until weaning. Pre-weaned calves should get their nutrients from milk and a high quality calf starter. However, once the calf is weaned, begin feeding high quality hay or a cottonseed hull-based heifer TMR.
- Wean at 6 weeks of age or when the calf consumes 2 pounds of calf starter for 3 consecutive days.

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