Nutrition Programs for Dairy Heifers the First Year of Life Impact Growth

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The nutritional and management program of dairy calves prior to weaning and post-weaning will have a substantial impact on the growth and age/weight at breeding and calving. Adequate amounts of both energy and protein are needed for adequate weight and height at puberty and breeding. Proper protein nutrition at this time is very important as protein stores in muscle are being laid down and more rapid growth of bone is occurring. In the first 6 months of life, well-fed heifers will attain approximately 50% of their mature height. Young calves can be underfed protein when rations are not balanced to reflect the type and quality of forages being fed and/or lower protein grain mixes than required are fed for economic reasons.

Management before Weaning Affects Growth Post-Weaning

A good heifer development program starts with the nutrition and management program for the baby calf. For proper growth of dairy calves post-weaning, baby calves need to be managed to promote optimum rumen development at an early age. They should double their birth weight in this time period.

The key points to a well- managed calf development program include:

1. Colostrum is the single most important means of increasing calf survival and growth. Colostrum needs to be fed ideally within an hour of birth, but at least by 6 hours of life, at the rate of 3-4 quarts depending on breed. Calves are born without antibodies to disease and the small intestine loses its ability to absorb immunoglobulins within 24 hours after birth. Calves which are allowed to nurse their dams may not receive adequate amounts of immunoglobulins to prevent disease. Colostrum contains additional factors, hormones and various growth factors which impact growth and production later in life. This, adequate colostrum intake early in life is critical.

2. Calves should be housed in an environment which is clean and draft-free. Individual hutches or group pens can be effectively used to house calves.

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3. During the first few weeks of life, all of the calf's nutrition comes from milk. Whole milk or a good milk replacer should be fed according to manufacturer's directions. During extremely cold weather, additional milk replacer should be fed, since the calf's energy needs increase during this time period.

4. **Water should be available by day 4 of age.** Water should be changed daily and provided in clean buckets. In the rumen, a liquid environment is necessary for bacterial growth to ferment the calf starter which in turn results in rumen development. Water needs to be fed separately from milk. Remember that the consumption of milk results in the closure of the esophageal groove triggering milk to be "funneled" from the esophagus into the abomasum and thus bypassing the rumen.

5. **A highly palatable calf starter should be fed starting at day 4 of age.** Calf starter should contain at least 18% crude protein, not be diluted with other grains such as corn unless sold as a protein supplement, and should contain an effective concentration of a coccidiostat or coccdioside (Bovatec, Rumensin, or Deccox). Uneaten calf starter should be removed daily and replaced with a small amount of fresh starter. Concentrate mixtures formulated for the milking herd or older heifers should not be fed to baby calves because they often times contain feedstuffs which may not be palatable or may not be digested easily by the baby calf. Palatability is highest for textured grain mixtures followed by complete pellets. Calves generally do not like meal-type feeds which result in lower intakes because of lower palatability. Intake of calf starter results in the production of volatile fatty acids (primarily propionate and butyrate) and the growth of the rumen papillae which absorb these volatile fatty acids.

6. Hay should not be fed to baby Holstein calves until they are consuming 4 to 5 lbs of calf starter. Young calves have a high energy requirement. Replacing calf starter with hay decreases the amount of energy consumed by the calf and can slow growth. Generally, calves are bedded with straw which provides the small amount of fiber needed.

Management at Weaning Time

1. **Calves should not be weaned until they are consuming 2 lbs/day of calf starter over a two or three day period.** When weaned, the source of nutrients changes dramatically, from milk to starter feeds. Rumen fermentation now provides the nutrients needed for the calf to grow.

2. Weaning time is very stressful on the calf. Thus, the amount of stress needs to be reduced during this time period. Vaccinations, dehorning, and other management practices should not be done 2 to 3 weeks after weaning.

3. To further reduce the stress associated with weaning, calves should continue to be housed as previously. This allows the calves to adjust to the absence of liquid feeds and increase their intake of calf starter to replace lost nutrition from milk before subjecting them to competition for feed in a group feeding situation.

4. Recently weaned calves should remain on the same calf starter as fed prior to weaning. The protein needs of recently weaned calves are very high because feed intake is low.

Feeding Programs from Two until Six Months of Age

1. After calves are consuming 4 to 5 pounds of a concentrate mixture, they can be moved to small groups of similar size and weight. Young heifers need to stay in these smaller groups for one to two months.

2. Forages form the foundation upon which diets for heifers, dry cows and milking cows are based. The quality and type of forages fed dictates the amount and protein content of the concentrate mix fed to heifers. All forages fed to heifers and dry cows should be tested for their nutrient content and concentrate mixes formulated to provide the heifers the nutrients they need in order to achieve adequate and economic growth. As the quality of hay decreases, the amount and protein content needed in the concentrate mix increases in order to meet these heifers protein and energy needed for efficient growth.