



Calves need consistency to perform well

Consistent preweaning feeding programs get calves off to a solid start in life.

by A. F. Kertz

SEVERAL things about calves may get lost in the everyday activity on a dairy. Since calves are babies, they are very sensitive to changes and inconsistencies. At the same time, they are the most efficient animal in converting nutrients to growth on your dairy.



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More gain with replacer

A study by Mark Hill and his associates compared three feeding programs at the Provimi North America calf research facility. Calves were either fed:

- milk replacer (MR) alone (20 percent protein/20 percent fat)
- mixed 50:50 with raw milk
- raw milk alone

The diets were fed in equal volumes for six weeks. After weaning, calves continued on the study for another two weeks. Raw milk fed to calves averaged 13.6 percent average dry matter, 25.3 percent protein, and 28.5 percent fat.

Daily dry matter intakes (DMI) were about 1 pound across all treatments. But average daily gain (ADG) and starter intake were greater for calves fed milk replacer alone because starter intake was greater. This reflected more energy and protein intake from treatments containing milk but less starter intake. Energy intakes among all treatments were similar.

In the second trial, calves were fed 1.5 pounds dry matter daily from either 17 or 30 percent fat milk replacer, both of which contained 26 percent protein. These milk replacers were fed to calves at a daily fixed

rate of 1.5 pounds or starting at 1.2 pounds and growing to 1.8 pounds but averaging 1.5 pounds over the trial. These feeding regimes were followed for only 7 days of a 28-day period followed by fairly abrupt weaning.

For the 28-day period, ADG was greater for fixed feeding rate and for lower fat.

Watch added variation

At the 2011 annual Dairy Calf and Heifer Association meeting, Sheila McGuirk of the University of Wisconsin Veterinary School found considerable variation in daily solid levels fed to calves. In one evaluation, this ranged from 8.8 to 12.5 percent over a 5-day period.

Variation can become even more problematic when pasteurized waste milk is mixed with some milk replacer to feed all the calves. There are three sources of variation:

- waste milk solids
- milk replacer mixing rate with water and into waste milk
- day-to-day variation when quantity of waste milk varies

In addition to this variation, it has been my experience that when total solids exceed 15 percent, calves may be predisposed to digestive upsets and clostridia. A good tool to manage feeding programs was developed by Penn State and Virginia Tech. (<http://bit.ly/Hoards-PennState-calf-feeding>).

High-protein milk replacers yielded more efficient gain			
Milk replacer, % protein and % fat	23.5/15	24.8/22	27/31
DMI, lbs./d	2.20	2.10	1.86
Empty body gain, lbs./d	1.34	1.34	1.43
DMI/ADG	1.66	1.54	1.31
Body protein gain, lbs./d	0.24	0.24	0.25
Body fat gain, lb./d	0.16	0.21	0.25
Body fat % of DM	35.7	42.9	46.1
Body fat % as-is	11.7	14.9	17.2

On many operations, information on intakes, nutrient content of dietary feedstuffs, ADG, height, or other growth measures often go unrecorded. So when asked, "How are your calves doing?" the answer usually is given in terms of health and general observations about perceived intake or appearances.

Higher protein preferred

Accelerated calf research began with a Cornell study about 10 years ago. Accelerated plans involved feeding milk replacer with a combination of higher fat and protein levels. They resulted in similar 1.54 pounds ADG in male Holstein calves. But body fat levels rose more than desired with high fat and protein content milk replacers. (see table). Lower fat coupled with higher protein resulted in the preferred growth and body composition.

In a subsequent Cornell study, a 30 percent protein/20 percent fat milk replacer was fed at greater levels (1.43, 2.35, and 2.51 of percent body weight) to provide ADG of 1.1, 2.1, and 3.1 pounds.

The lowest feed conversions occurred with the lowest feeding rate and resulted in lowest ADG. Within the higher feeding rates, poorer feed conversions resulted because of more body fat deposition. In terms of efficiency, it takes more energy to deposit fat than protein.

Further studies at Illinois found that feeding more milk replacer improved ADG and feed efficiency. They found raising dietary protein linearly boosted ADG, skeletal measurements, and gains of water and protein. At the same time, fat gain linearly dropped. As dietary crude protein was added, fat content in empty body fell, and water and protein deposition went up. This reaffirmed the Cornell work in establishing the benefits of feeding higher protein and lower fat milk replacer.

When feeding animals, maintenance requirements are met first. Then, the additional nutrients are available for growth.

In another Illinois study, comparing a 28/15 to a 20/20 milk replacer, conversion of dry matter intake (milk replacer plus calf starter) was better with 28/15 milk replacer calves weaned at 6 weeks of age.

Calves fed more milk replacer powder at about 1.75 pounds daily with higher protein and lower fat than traditional replacers gained more body weight without excessive fattening. Also, they were more efficient in converting nutrients to growth since maintenance requirements were spread over larger gains.

Don't overlook feed efficiency

As calves grow into larger heifers, their feed efficiency drops, note researchers from Rancho Las Nieves in Spain; see the April 10, 2008, Hoard's Dairyman, pages 264 to 265. They require more dry matter intake to maintain their larger body weights before growth occurs.

The best feed efficiency, 1.74, occurred when calves were fed milk replacer and calf starter.

Depending on prices of feedstuffs at a particular time and place, the greater feed efficiency before weaning can result in a lower feed cost per ADG. While the cost per pound of feed for large heifers is much less than for calves, their requirements are more substantial ("Here's the low down on daily growing costs," April 25, 2000, Hoard's Dairyman, pages 302 to 303). Also, feeding a higher proportion of forage results in lower feed efficiency since its fermentation is slower leading to greater rumen fermentation and gut fill.

Help your calves along in their growing cycle by being more consistent in liquid feeding programs. This can be accomplished by boosting feeding rates with balanced nutrition commensurate with good calf starter and transition weaning programs.