CALVING EASE

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Rumen Development

Calf raisers must be about the only people interested in this topic. By the time heifers get moved to "heifer" barns they are ruminants and their rations are balanced for ruminants. But, when we get them at birth they function as simple stomach animals. Sometime in the first two months of life our heifers make the transition from non-ruminant to ruminant digestion. Why? How? When?

Defined

What do we mean when we say, "rumen development?" There are two major differences between the immature and mature bovine rumen.

One difference is the surface on the inside of the rumen. The inner surface of the rumen is designed to absorb fatty acids produced by bacteria in the rumen. The immature rumen surface is relatively smooth and, therefore, inefficient in absorbing nutrients. The mature rumen inner surface is covered with papillae - what we might think of as tiny fingers that stick out from the surface. They multiply the absorbing surface many times.

Also, the outer rumen surface is composed of muscle. These muscles contract to move rumen contents around and increase fermentation. In the young calf, these muscles are not strong and don't contribute much to fermentation.

A second difference is the mix of bacteria present. Studies have shown that the numbers of bacteria don't change too much from an immature to mature rumen. But, major changes take place in the kinds of bacteria. A mature rumen is populated by bacteria that are capable of breaking down plant fibers found in grains and forages.

When a calf raiser says, "I want to stimulate rumen development," what is meant is she wants to encourage both the formation of the papillae and the transition to a bacterial population that can digest plant fibers.

Why Rumen Development Happens

We know that not all calves experience the same rate of rumen development. Why? Several well-designed research projects have examined this question. They have eliminated the "scratch" explanation - scratchy stuff alone doesn't do the job.

They did find out that carbohydrates are essential as is water. Carbohydrates are found in feeds such as calf starter and, to a lesser extent, hay.

If a calf is not exposed to carbohydrates such as these the two transitions (growth of papillae and change in bacterial population) are delayed. Looking behind the scenes the researchers found the reason water and carbohydrates were important. As these two ferment in the developing rumen they produce VFA's (volatile fatty acids). These VFA's get the ball rolling for papillae growth and the bacterial change-over. This transition only takes about two weeks.

By the end of that period the calf is now capable of generating significant amounts of nutrients from the rumen and is no longer milk-dependent. This marks a break-through in nutrition. Now the calf can digest enough grain to gain 1.5 to 2 pounds daily. She is no longer dependent on a liquid diet.

Management Guidelines

The least expensive ingredient for encouraging rumen development is water. Free-choice water is ideal. Providing liquid water can be a challenge in Western New York in the winter months. What ever can be done is a step in promoting early rumen development.

Calf starter is a common ingredient in calf rations. Most of us provide it free-choice from day 1 in hutches or pens. But, not all calves recognize it as feed. Further, some calves seem not to notice that there is a second pail at their hutch or pen. So, all is not rosy. We all have used tricks to get calves to begin eating calf starter. Well, the word is just to keep using them. It's the fermentation of these carbohydrates that makes the VFA's that stimulate the changes we want in the rumen.

Hay. This is dangerous ground on which to tread. Hay or no hay? At what age? Hay does contain carbohydrates. Hay will ferment and support the formation of VFA's. You certainly can't kill a calf feeding hay. But, hay compared to calf starter is a much less concentrated source of readily fermentable carbohydrates.

For very early rumen development (less than six weeks, for example) the calf raiser can promote more rapid rumen development with calf starter than with hay. Once the ball is rolling along (good papillae growth, bacterial population has changed) limited hay feeding seems to make good sense.

Calf Feeder's Tip

Kristin Johnson, a calf raiser from Lamb Farms in Oakfield, NY, suggests that cold colostrum or milk can be heated more quickly if one plans ahead. Place the bottle or pail containing the cold milk in a bucket of hot water. But, plan ahead. Make certain the bucket is deep enough to permit placing a cover on it after you have put in the milk container. Just like covering a saucepan on the stove when boiling water makes the water boil sooner, covered buckets will heat cold milk more quickly.

If you know of someone that doesn't currently receive **Calving Ease** but would like to, tell them to **WRITE** to Calving Ease, 11047 River Road, Pavilion, NY 14525 or to **CALL** either 585-591-2660 (Attica Vet Assoc. office) or 585-343-8128 (Offhaus Farms Office) or **FAX** (585-591-2898) or **e-mail** sleadley@frontiernet.net or pams91@2ki.net . A limited number of back issues may be accessed on the Internet at www.calfnotes.com and clicking on the link, Calving Ease.