CALVING EASE

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Colostrum Testing and Feeding

Summary:

- When testing colostrum quality for antibody concentration the most reliable values will come from fully milking out the cow at her first milking. Take a sample from the milker bucket to use with a Colostrometer or Brix refractometer.
- Hand-milked colostrum (first 3 or 4 quarts) will have the same antibody concentration as if the cow was milked out entirely.
- Only about 40% of calves will voluntarily consume 3 or more quarts in the first feeding.
- Always have a person available who is trained to use an esophageal tube feeder. It is common to have as many as 3 out of 10 calves that will not voluntarily drink even 2 quarts of colostrum.
- Follow best management practices when using an esophageal tube feeder for colostrum feeding.

Checking for colostrum quality

Other publications have described how to estimate antibody concentration in colostrum (See www.atticacows.com, in Calf Facts find "Colostrum testing using a Brix refractometer." See www.calfnotes.com, #22 Using the Colostrometer to measure colostrum quality.)

Recently reported research done with Holstein cows measured antibody concentration by stage of colostrum milk out. They compared antibody (IgG) values at the very beginning of milking, at 25, 50, 75 and 100 percent of milk out.

The colostrum at the very beginning of milk out (sometimes called cisternal) had the highest concentration of antibodies. Compared to full milk out (could be called composite) the very first colostrum from the udder was roughly 5 percent higher in antibodies. When colostrum is of high quality this difference probably makes no practical difference. However, when testing marginal-quality colostrum, better estimates come from full-milk-out samples.

As an aside here, the average IgG concentration for all animals was 72g/liter (recall our threshold for acceptable colostrum is 50g/l). However, the range of IgG levels was 22 to 140g/l. This emphasizes again the value of checking quality. Four quarts of 22g/l

colostrum only supplies 83g of IgG – that's only about 40% of our goal of 200g in the first four hours of life. That's one reason calves fed this poor quality colostrum often get sick.

Don't expect all calves to voluntarily drink 3 or 4 quarts of colostrum

The research reported here offered 3.2 quarts (3L) with a nipple bottle for 15 minutes at 2 hours of age. All of the calves were able to stand by themselves. They reported:

- 31% of the calves consumed less than 2.1 quarts (2L).
- 44% of the calves consumed the entire amount offered, 3.2 quarts (3L).

Let's assume that a dairy's colostrum feeding goal is to get consistent and adequate transfer of antibodies from colostrum. Given the information above, it seems reasonable that some calves will need to be fed colostrum with an esophageal tube feeder.

First, recall that in the November 2009 issue of Calving Ease, "Using a tube feeder – Yes or No?" the research showed that when amounts of 2 quarts or less were consumed, using a nursing bottle gave a higher rate of antibody absorption than using a tube feeder.

Thus, given that every calf needs 4 quarts of colostrum within the first 4 hours of life, when a dairy prefers to split this amount into two equal feedings the best management practice is to start with a nursing bottle. If the calf voluntarily drinks less than 2 quarts at first feeding, give the rest of this amount with a tube feeder. At the second feeding, be prepared to feed whatever is not nursed also with a tube feeder.

Second, I feel from the point of view of animal husbandry it is preferred to start feeding colostrum with a nursing bottle. Then what ever amount of the 4 quarts is not voluntarily consumed can be fed with a tube feeder. I like to see saliva mixed with as much of the colostrum to promote digestion. Also, I think getting the calf to stand to nurse favors more prompt adaptation to her new environment outside the dam. Getting the first portion of the colostrum directly into the abomasum favors earlier absorption as well.

Third, when a dairy prefers to feed all 4 quarts of colostrum in one feeding shortly after birth, research shows that if 3.7 quarts or more colostrum if fed at one time the method of feeding (nursing bottle or tube feeder) does not change the efficiency of antibody absorption.

Reference: Kelvin Urday, M. Chigerwe, J.W. Tyler "Voluntary colostrum intake in Holstein calves." The Bovine Practitioner, 42:2 198-200 2008. Sandra M. Godden, Amber Hazel "Relationship between milking fraction and immunoglobulin G concentration in first milking colostrum from Holstein cows." The Bovine Practitioner, 45:1 64-69 2011.

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