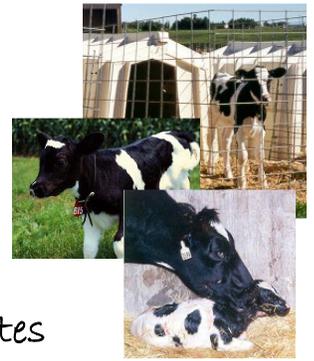


Calving Ease

August 2011

By Sam Leadley of Attica Veterinary Associates



Colostrum: Quantity and Quality

Summary: What quality and quantity of colostrum should we expect from our Holstein cows with 20th century genetics? Recently research (N=507 cows) reported that approximately 90% of the samples contained at least 50 mg/mL antibodies (IgG) and 43% contained at least 100 mg/mL IgG. [The threshold for “adequate” quality is usually 50mg/mL.] The amount of first-milking colostrum was roughly between 6.4 and 7.2 quarts. Bottom Line: **Well-managed cows milked soon after calving, on the average, produce enough high quality colostrum to provide excellent immunity for our calves.**

Study population and colostrum collection

Three herds were involved ranging from a low of 689 to 1,862 cows. Diets on all farms generally followed NRC2001 nutritional guidelines. They all had specific dry cow protocols and followed vaccination protocols for both heifers and dry cows. Colostrum was collected from all the cows within the range of 2 to 6 hours postcalving.

Quality variation by lactation

The average antibody (IgG) concentration by lactation was:

- 1st lactation 83.5 mg/mL
- 2nd lactation 92.9 mg/mL
- 3rd lactation 107.4 mg/mL
- 4th+ lactations 113.3 mg/mL

Ten percent of the total 507 samples were below 50 mg/mL. Fully 45 percent of the total had an IgG concentration of 100 mg/mL or greater. This highest quality colostrum delivers at least 95 grams of antibodies per quart or 380 grams in a 4-quart feeding.

Knowing which colostrum is in that bottom 10 percent is a good reason to check IgG concentration before feeding.

Quantity to expect

Average volume of first-milking colostrum was in the range of 6.4 and 7.2 quarts. A few dams gave 2 quarts or less while 15 others yielded in nearly 3 gallons or more. While we can expect wide variations in yields many of the cows will fall in the range of 4 to 6.5 quarts. Remember that all the dams were milked for the first time in the range of 2 to 6 hours post-calving. There was some measurable variation in volume by lactation but that might have been due to factors other than parity.

Quality variation by volume

There was a very wide variation in antibody (IgG) concentration at every interval of colostrum volume. For example, at the 4-quart volume the lowest IgG concentration was approximately 15 mg/mL and the highest was 200 mg/mL. Or, at the 12-quart (3 gallons) volume the lowest value was about 40 mg/mL and highest value was 220 mg/mL.

There was a measurable decrease in IgG concentration as volume increased among cows 3rd lactation and greater. However, this relationship between volume and IgG level was dwarfed by the variation among cows at any level of colostrum yield. No connection was found between volume and concentration among 1st and 2nd lactation samples.

Knowing the volume, therefore, is an unreliable guide to sorting out the lowest quality colostrum. Better to measure than guess.

Measuring antibody concentration

Better to measure than guess. A Colostrometer® measures specific gravity as a means of estimating antibody concentration. Remember that you trap air in the colostrum when you fill your bottle or tube. Let it sit for 4 to 5 minutes. Then take your reading. I like to measure antibody levels ASAP after collecting colostrum – remember that in warm colostrum a Colostrometer will slightly underestimate antibody concentration. So, if it reads either green or yellow the colostrum is okay – 50 mg/mL or greater. Colostrometers cost in the range of \$35 to \$45.

A Brix refractometer measures solids level as a means of estimating antibody concentration. Look for a value of 22.0 or greater to show an antibody concentration of 50 mg/mL or greater. Thicker and more yellow colostrum will tend to have a rather “fuzzy” line between the dark and light parts. Don’t let this frustrate you too much. I just estimate about where the middle of the “fuzz” falls and assign a value.

For all the samples I have checked with a refractometer it was really quite easy to pick out the low quality samples. They were well down in the 15 – 16 range. If you are checking more than one sample be sure to rinse and dry the optic surfaces well between samples. Brix refractometers (0 to 30 range) cost in the range of \$65 to \$75.

Reference: Kehoe, S. I., A.J. Heinrichs, M.L. Moody, C.M. Jones, and M.R. Long, “Comparison of immunoglobulin G concentrations in primiparous and multiparous bovine colostrum.” Professional Animal Scientist 27 (2011): 176-180.

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** 585-591-2660 (Attica Vet Assoc. office) or **FAX** (585-591-2898) or **e-mail** calvingease@rochester.rr.com.
A limited number of back issues may be accessed on the Internet at either www.atticacows.com or www.calfnotes.com and clicking on the link, Calving Ease.

Our thanks to Boehringer-Ingelheim for
supporting Calving Ease.