

Colostrum: Quality and Quantity

- **Poor quality colostrum is out there. Knowing which colostrum is under 50g/ml is a good reason to check IgG concentration before feeding.**
- **In these studies 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.**
- **But just knowing the volume is not a reliable guide to sorting out the poorest quality colostrum. Better to measure than guess.**

What was the quality variation by lactation?

Good quality colostrum is defined as having at least 50mg/ml of antibodies (IgG). The **average** antibody concentrations by lactations were:

	Pennsylvania Data	National US Data
• 1 st lactation	83.5 mg/mL	42.4 mg/ml
• 2 nd lactation	92.9 mg/mL	68.6 mg/ml
• 3 rd lactation	107.4 mg/mL	95.9 mg/ml [3 rd + lactations]
• 4 th + lactations	113.3 mg/mL	no data

Some 10% of the 507 samples from PA were below 50 mg/mL. In comparison, for the US data showed fully 29 % of the samples below 50 mg/ml.

In Pennsylvania fully 45% of the total had an IgG concentration of 100 mg/mL or more. In contrast, the US data showed only 15% of the total had 100 mg/ml or greater.

What 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 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. There was some measurable variation in volume by lactation but that might have been due to factors other than the lactation number of the dam. For resource on trouble-shooting low colostrum production click [HERE](#) (University of Wisconsin, Dr. Sheila McGuirk).

Was there predictable quality variation by volume?

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

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There was, however, a measurable decrease in IgG concentration as volume increased among cows 3rd lactation and greater. Yet, 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.

How can I measure antibody concentration in colostrum?

It is better to measure than guess. A Colostrometer® is one of two tools to estimate antibody concentration. It measures specific gravity as a means of estimating antibody concentration. For a brief review of how to use this instrument including pictures click [HERE](#).

Remember that you trap air in the colostrum when you fill your bottle or tube. Let it sit for 4 to 5 minutes to let the air bubbles escape from the colostrum. 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 more. Colostrometers cost in the range of \$35 to \$45.

A Brix refractometer measures solids level as a means of estimating antibody concentration. For a brief review of how to use the optical model instrument including pictures click [Calibrate](#) and [Use](#). Look for a value of 22.0 or greater to show an antibody concentration of at least 50 mg/ml. Thicker 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. Digital models are available, too.

For all the samples I have checked with an optical refractometer it was really 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 around \$65 to \$75. Digital models cost 5 or 6 times as much.

Where did this information come from?

Study population and colostrum collection in Pennsylvania study.

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 2 to 6 hours post-calving.

Study population and colostrum collection in US study.

Sixty-seven herds were involved ranging from a low of 70 to over 5,000 cows in NH, NY PA, FL, GA, VA, IA, MN, WI, AZ, CA, TX. No data were reported on animal nutrition, dry cow protocols and vaccinations, or on the interval between calving and colostrum collection.

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