

Colostrum: Quantity and Quality

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 within the range of 2 to 6 hours postcalving.

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. No data were reported on the interval between calving and colostrum collection.

Quality variation by lactation

The **average** antibody (IgG) concentration by lactation was: [for reference, “good” quality colostrum is often defined as at least 50mg/ml]

	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

Ten percent of the total PA 507 samples were below 50 mg/mL. In comparison, the US data showed twenty-nine percent of the samples fell below 50 mg/ml.

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

Bottom Line: Poor quality colostrum is out there. Knowing which colostrum is under 50g/ml 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 the lactation number of the dam.

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.

Bottom Line: 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. 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. 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.