

KNOW THE COLOSTRUM EQUATION

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This fact sheet is the third of four explaining proper colostrum management techniques. The objective of this publication is to discuss when and how to feed colostrum to newborn calves.

FEEDING COLOSTRUM

Feeding colostrum to calves is critical for gastrointestinal and immune development. If fed incorrectly, calf disease and death could double. There are multiple ways to feed colostrum including bottle, esophageal tube or nursing the dam. According to a 2007 USDA survey, 36.3 percent of producers still allow calves to receive first colostrum feeding from the dam, which is an inefficient way to feed dairy calves colostrum. In recent studies, 46-61 percent of dairy calves left with the dam did not receive the appropriate amount of colostrum by 6 hours of age. Bottle and nipple feeding is the preferred method to prevent esophageal damage and ensure calves receive sufficient **quality** and **quantity** of colostrum **quickly** (the three Q's of colostrum feeding).

THE CRITICAL WINDOW OF FEEDING COLOSTRUM

- Colostrum ingestion should occur quickly after birth for effective immune development.
 - The ideal colostrum feeding time is 15 to 30 minutes after birth to maximize antibody absorption.
 - Six hours after birth, efficiency of colostrum antibody absorption begins to decrease.
 - Little to no antibody absorption occurs 24 hours or more postpartum (Figure 1).

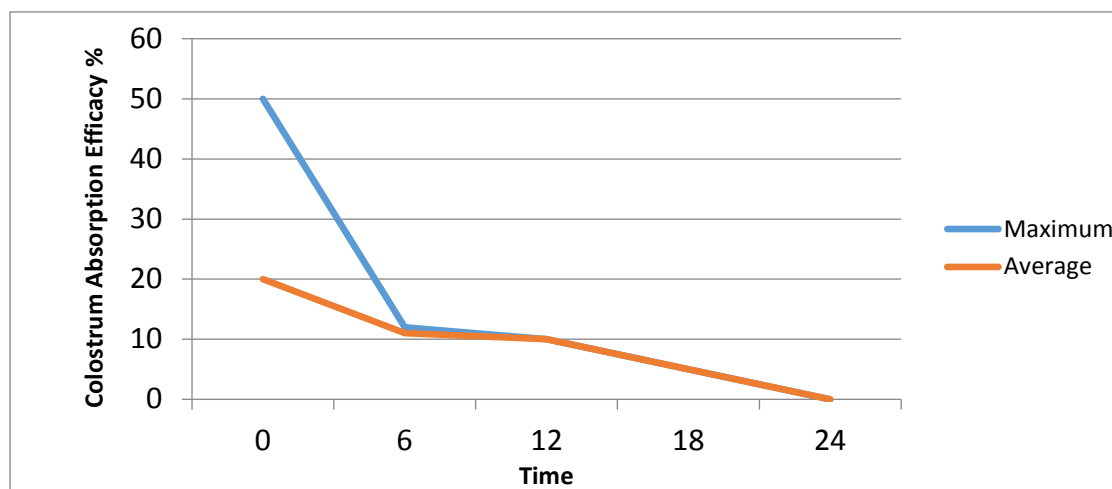
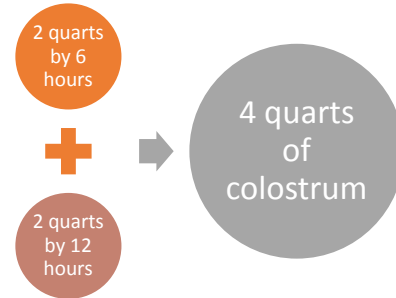


Figure 1: Effective colostrum absorption each hour after birth. It is essential to meet quantity recommendations. At 12 hours, gut absorption of antibodies drops below 10 percent. This graph was adapted from the University of Minnesota Extension.

THE COLOSTRUM EQUATION

- **Quantity** is just as important as **quality** and **quickness**.
 - Feed calves **at least** 2 quarts of high-quality colostrum (greater than 50 mg/mL of Ig) by 6 hours after birth.
 - In addition, feed **no less** than 2 quarts to calves at 12 hours of age.
 - Consider the size of the calf when feeding colostrum.
 - Recommendations from the University of Minnesota Extension include the following colostrum feeding volumes:
 - 2 quarts at birth, 2 quarts at 12 hours for calves less than 50 pounds.
 - 3 quarts at birth, 2 quarts at 12 hours for calves 50 to 100 pounds.
 - 4 quarts at birth, 2 quarts at 12 hours for calves greater than 100 pounds.



USING BOTTLE AND NIPPLE FEEDING

- Considered the best method of feeding colostrum to newborn calves (Photo 1).
- Things to consider when using nipple and bottle feeding colostrum:
 - Allows calves to nurse properly, feed independently in future feedings, and encourages calves to stand up and build strength in their legs.
 - Too big of opening in the nipple can cause aspiration (fluid in the lungs).
 - Less likely to cause esophageal damage compared to esophageal feeders.
- Before each use, equipment should be clean and checked for damages; replace as necessary.
- When feeding, have the calf standing or in a sternal position.
- Bottle feeding colostrum takes time, and patience is necessary.



Photo 1. A calf drinking colostrum fed with a bottle and nipple.

USING ESOPHAGEAL FEEDERS

- Purpose of tube feeding.
 - A feeding method used for calves struggling to suckle from a teat/nipple.
 - Alternative colostrum feeding method that should be used as a last resort.
- Using an esophageal feeder (Photo 2).
 - Ensure the feeder is clean and undamaged before each use.
 - Consider the length of tube and size of calf prior to feeding.
 - Ideal tube length should be the distance between the mouth of the calf to the point of its shoulder.
 - Position the calf to prevent fluid aspiration into the lungs.
 - Standing is preferred; however, lying in a sternal position with neck pointed up is sufficient.
 - Place esophageal tube or feeder tube in the corner of the calf's mouth and slowly allow the calf to swallow esophageal tube.
 - After placing esophageal tube into the calf, palpate the left side of the calf's neck to ensure the tube is in the esophagus.
 - Feel for two tubes; one will be the trachea and the other will be the feeder.
 - If two tubes **are not** present, then remove the feeder and attempt again to pass the feeder into the esophagus.
 - Excessive fluid allowed into the trachea has the potential to drown the calf.
 - Turn the colostrum container upside down, and gravity will pull the colostrum to the calf.
 - Slowly remove the feeder tube and clean immediately.
 - Rinse with lukewarm water first.
 - Follow with a hot water and chlorine wash.



Photo 2. A producer prepares a calf for esophageal tubing. The calf needs to be standing or in a sternal position prior to tubing. Place the tube in the side of the calf's mouth and allow the calf to swallow it. Once the calf swallows the tube from the esophagus into the abomasum, tip the colostrum container over and allow the contents to flow into the calf's GI tract.

CONCLUSIONS

- At minimum, feed 4 quarts of colostrum by 12 hours after birth.
- Bottle feeding calves colostrum is preferred over esophageal tube feeding to prevent esophageal damage.
- Remember the three Q's of colostrum feeding:
 - Quickness.
 - Quality.
 - Quantity.



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