

Colostrum Replacers Provide A Simple and Effective Way to Achieve Passive Immunity!

While maternal colostrum, many times, provides calves with the nutritionally complete start they need to become productive members of the future milking herd, it also provides producers several challenges and obstacles to overcome. The data presented in this article brings those challenges to the fore front and presents using a quality colostrum replacer as a more simple, effective way to achieve passive immunity.

Timing of Collection:

A complicating issue of collecting and feeding maternal colostrum at the farm can be timing. The concentration of IgG's in maternal colostrum decreases rapidly after parturition due to absorption of the IgG proteins and dilution due to the cow initiating peak lactation. Figure 1 below depicts the magnitude of the decrease over time observed in a study by Moore, et al.

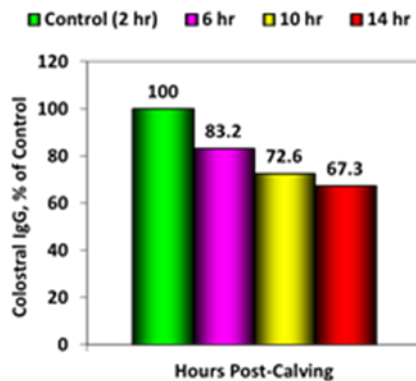


Figure 1. Effect of delayed colostrum collection relative to calving on colostral IgG concentration (% of control) in Holstein cows (Moore et al., 2005).

Timing of Feeding:

To further complicate the timing issue – the calves' ability to transfer immunoglobulins from the digestive tract to the bloodstream also decreases over time after birth as measured by apparent efficiency of absorption (AEA%).

Calves' Ability to Effectively Transfer Variable by Time

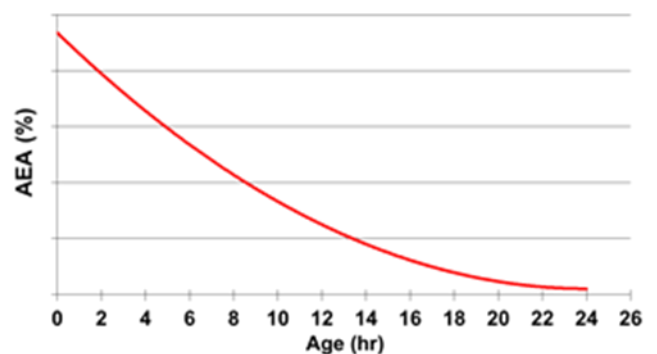
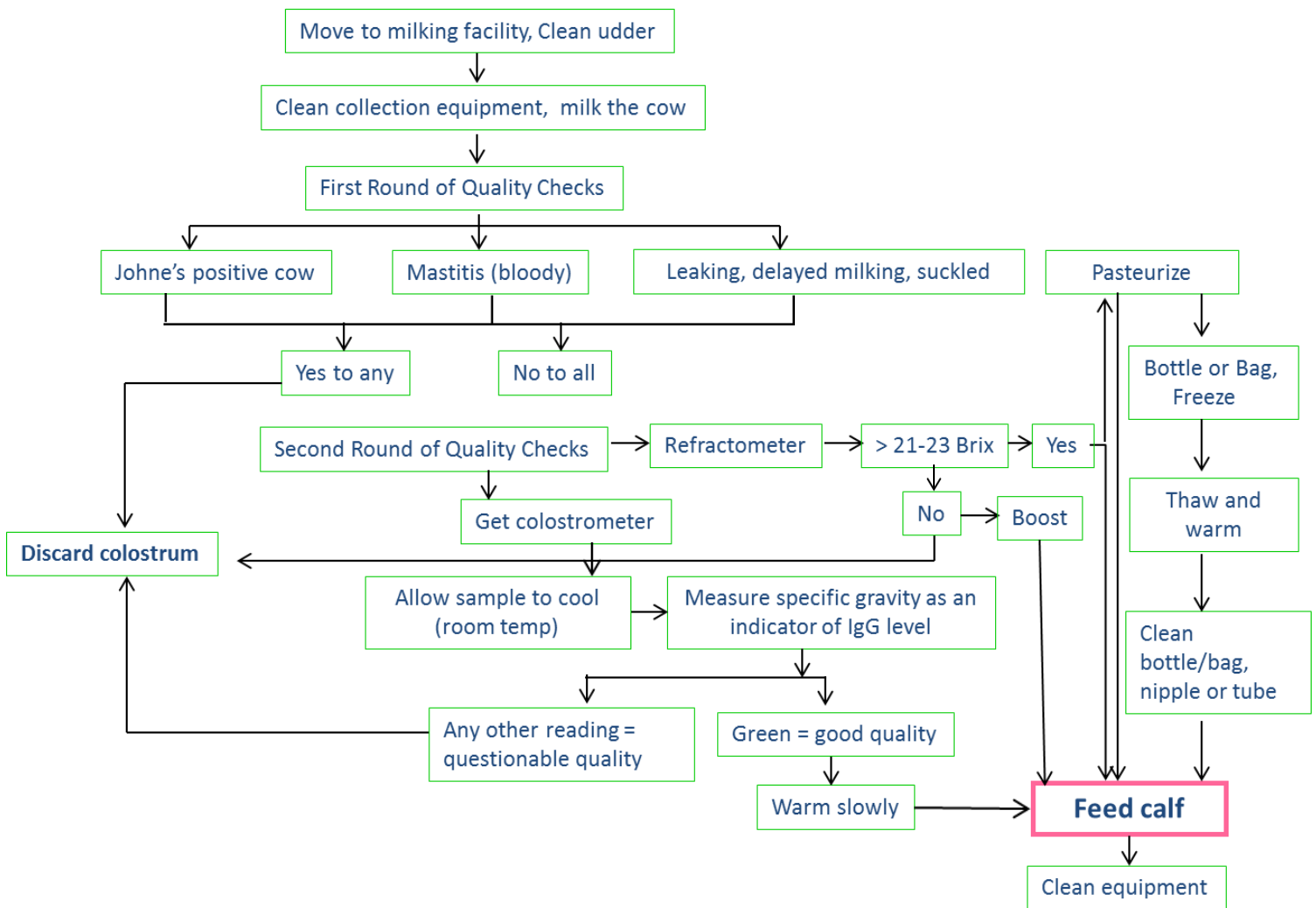


Figure 2. Shows the magnitude of this trend.

Variation in Colostrum Quality – Farm to Farm and Cow to Cow:

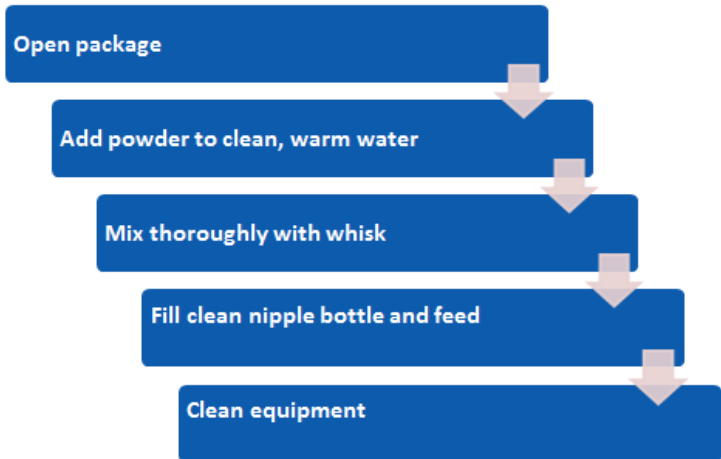
Variable maternal colostrum Ig concentrations have been observed in a survey conducted with 55 Pennsylvania dairy farms, where colostrum Ig concentration averaged 41 g/L but samples varied from 14.5 to 94.8 g/L (Kehoe et al., 2007). Godden et al. conducted a similar survey on a single farm in Minnesota. Such data indicated that even though the chosen farm had an average maternal colostrum IgG concentration which was acceptable, 71.7 g/L - the cow to cow range of colostrum IgG concentration was great 14.5 – 132.7 g/L. Unless colostrum quality is routinely monitored, it is likely that some calves are not receiving adequate Ig intake despite consuming enough colostrum volume. Managing variation in colostrum quality requires routine monitoring (i.e., use of a colostrometer), but this inherent variation is also one of the major reasons to utilize a high quality colostrum replacer.

Steps to effectively using maternal colostrum:



Colostrum Replacers are as Easy as 1,2,3:

The process of feeding a known concentration of IgG in a quality colostrum-based colostrum replacer is much simpler:



Additional advantages of feeding a quality colostrum replacers include:

- Quality – Same amount of IgG fed every time
- Quantity – Not dependent upon what the cow gives
- Quickness – Just open, mix, and feed
- Cleanliness – Fewer steps in which contamination may occur
- Biosecurity – Reduced risk of colostrum-transmissible diseases such as Johne's, BLV, Mycoplasma or Salmonella

FPT Not Just a Dairy Calf Problem:

Historically, failure of passive transfer (FTP) has been predominately associated with dairy calves, but researchers have concluded that FPT occurs in 12-15% of beef calves as well. Beef calves demonstrating FTP (i.e. total protein levels < 5.5 g/dL) were 3.07 (95% CI 1.73-5.43, p=0.0002) times more likely to become ill as beef calves demonstrating successful passive transfer (i.e. total protein levels > 5.5 g/dL) (Courtney et al.). By providing beef calves with a quality colostrum replacer or supplement, which is a known amount of IgG, producers may be able to reduce treatment costs and preweaning mortality.

References

A.K. Courtney , W.B. Epperson , T.A. Wittig R.J. Pruitt , and D.M. Marshall. 1998. Defining Failure of Passive Transfer in South Dakota Beef Calves. Departments of Veterinary Science, Mathematics 8. Statistics and Animal and Range Sciences - CATTLE 00-1 5

Godden, S. M., D. M. Haines, D. Hagman. 2009. Improving passive transfer of immunoglobulins in calves. I: Dose effect of feeding a commercial colostrum replacer. J. Dairy Sci. 92:1750.

Kehe, S. I., B. M. Jayarao, and A. J. Heinrichs. 2007. A survey of bovine colostrum composition and colostrum management practices on Pennsylvania dairy farms. J. Dairy Sci. 90:4108.