



# COW SENSE CHRONICLE

MARCH 2016

## COLOSTRUM IS ESSENTIAL FOR CALF HEALTH

It's a challenge for me to time my calving topics. Some people are finished or nearly finished and some are a month or more out yet, while still others are in the thick of it as I write. Regardless, this month the focus will be the importance of colostrum for calf immune system function. Colostrum is the first milk given by a cow following delivery of her calf. It is high in antibodies that protect the calf from invading microorganisms. These antibodies are large proteins called immunoglobulins, and in addition to these, colostrum also contains the milk protein casein, the milk sugar lactose, fat, and vitamins A and E.

Calves are born without any antibodies to protect them from disease, and the immunoglobulins found in colostrum establish the newborn calf's immune system. The antibodies are absorbed intact without digestion by the calf through "gaps" in the small intestine. The gut begins to "close up" after birth, and the large immunoglobulins are less able to be absorbed as the calf ages. For example, a 6-hour old calf is able to absorb around two-thirds of the immunoglobulins in a colostrum feeding, but a 36-hour old calf is able to absorb only 10 percent or less of the immunoglobulins in a colostrum feeding. Thus, it is very critical that the calf receive an adequate amount of colostrum very early after birth. Most recommendations suggest that calves receive at least 2 quarts of colostrum by the time they are 6 hours old, and an additional 2-3 quarts by the time they are 12 hours old.

The immunity a calf receives through colostrum is called passive immunity, and is the major source of immune function in the newborn calf. Calves who do not receive any colostrum after they are born will die. If calves receive only limited amounts of colostrum, this is termed failure of passive immunity. Calves who experience failure of passive immunity are twice as likely to get sick before weaning, and 5 times more likely to die before weaning than calves that have adequate passive immunity.

Passive immunity disappears within 2-3 months and is not replaced unless calves are exposed to a disease or vaccinated against a disease. Active immunity, that received from the calf's own body, does not become fully functional until the calf is 1 to 2 months old. That usually corresponds fairly well with the timing of branding vaccinations that calves receive.

Cow age and plane of nutrition can both impact colostrum. Mature cows make more colostrum than first-calf heifers, so it might be a good idea to keep an eye on calves from young cows to ensure they get adequate colostrum. Cows in a poor nutritional state will produce less colostrum of lower quality than cows on an adequate plane of nutrition. Research has also shown that calves born to cows fed protein-deficient diets were less able to absorb colostrum than their counterparts born to cows fed to meet protein requirements.

Ideally, calves should receive colostrum from their dam. A second choice would be from another cow within the herd. Colostrum can be collected from cows that have some to spare, frozen, and used for another calf at a later date. Colostrum should be collected from cows within 24 hours of calving. Using quart size plastic bags may assist with handling and storage of individual “servings” of colostrum. While colostrum should not be thawed and refrozen, it can be stored frozen for up to a year with no loss of quality.

Of course, correct thawing procedures are critical to maintaining colostrum quality, and it is highly recommended that colostrum be thawed slowly in warm water. Remember that 1980s commercial, “This Is Your Brain On Drugs” with the egg in the frying pan? The same concept applies to colostrum; just like the egg’s proteins are altered by cooking, the critical immunoglobulin proteins can be altered by warming the colostrum too fast (i.e., nuking it in the microwave!). Side note: I have to show my students the YouTube video of this commercial because they have no idea what I am talking about. Finally, if colostrum supplements or replacements must be used, be sure to check the IgG (immunoglobulin G) content on the label—a calf must receive 100 grams of IgG within the first 12-24 hours of life.

Proper pre-calving nutrition and good calving management practices play an important role in establishing passive immunity of the calf. Ensuring immediate and adequate intake of colostrum is a critical first step to lifetime calf health.

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