



Colostrum-The First Line of Defense

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The value of colostrum is irrefutable. There is no doubt that colostrum is the key to a good start for the newborn calf. It supplies much needed energy for combating the early spring chill that assaults the calf when it starts to take its first breathes. Colostrum also provides the only immune system protection for the calf for at least the first two weeks of the calf's life. This protection is in the form of maternal antibodies, as well as white blood cells from the calf's dam.

Failure of Passive Transfer (FPT)

The passing of maternal immune system components to the calf through the ingestion of colostrum is referred to as 'passive transfer'. When there is unsuccessful transfer of maternal immune system components to the calf, we refer to the problem as 'failure of passive transfer' (FPT). Failure of passive transfer (FPT) can be partial or complete.

Complete failure of passive transfer often occurs in cases of lack of intake shortly after birth, or lack of the presence of colostrum in the postpartum dam. A cow may completely lack colostrum if she allows other calves to nurse from her udder prior to her calving date.

Partial failure of passive transfer can occur a variety of ways. Inadequate intake, inadequate quantity of colostrum available, of inadequate quality of colostrum all can be causes of partial failure of passive transfer. Inadequate quantity can sometimes be a problem in first-calf heifers, a cow that has lost a quarter or two to mastitis, or a cow

that calves with twins well before her due date. In these cases, there is simply not enough volume of the precious fluid. Inadequate quality of colostrum is often a problem in first-calf heifers. They are young animals who have not had the level of immune system exposure that a mature cow has experienced. Inadequate quality can also be an issue in cows that leak colostrum from their udder prior to calving. The loss of colostrum results in a dilution of the remaining colostrum in the udder, which decreases the quality of the colostrum available to the newborn calf.

Quality Control

Given the value of colostrum to the newborn calf, adequate intake of high quality colostrum is the necessary goal. More often than not, Mother Nature achieves this goal without our intervention. However there are some management strategies that we can employ to be assured that the newborn calf is getting the best opportunity for a good start.

One of the first, easiest, and most necessary quality control measures we can utilize is simply observation. Is the calf nursing? Is it getting anything out of the cow's udder? Is the calf filling its belly? Does the calf appear hungry? Does the calf appear listless, depressed, and potentially hypothermic or dehydrated? All of these questions should come to mind when observing the cow/calf pair for the first time. Deviations from normal should be investigated immediately.

A colostrometer is a device that can be used to estimate the quality of a sample of colostrum. The colostrometer is a buoyant, glass instrument, with numerical gradations on the neck. A graduated cylinder is filled with colostrum, and the colostrometer is placed in the colostrum. The more thick the colostrum, the higher the colostrometer will float, indicating that the colostrum is of higher quality. If the colostrometer sinks, the colostrum is thin, and potentially of lower quality. Another method of determining if the calf has received adequate passive transfer is to measure the calf's blood protein levels. This requires some lab equipment, and usefulness of the measure typically starts to degrade after the calf reaches 7 days of age. Both of these methods of quality control can be utilized in 'problem' situations, however, are typically not feasible as routine procedures on most beef operations.

If there is a doubt that a calf is nursing, or if time constraints become an issue for the producer, it often is better to follow the 'better safe than sorry' adage. If you aren't sure whether or not a calf has nursed or is getting adequate colostrum, you can either 1) milk out the cow and tube or bottle feed the calf (if the cow will cooperate), or 2) thaw out some of the colostrum that you have frozen from another cow in your herd, and tube or bottle feed the calf.

Management Strategies

Vaccination of cows for colostrum immunity is an option for increasing the quality of colostrum that a cow will produce. This is often a practice applied to first-calf heifers that may not have high quality colostrum as they enter their first lactation. Different products have different recommendations, so it is important to discuss products and timing of vaccinations with your herd health veterinarian.

One of the most important factors that determine the health status of a calf crop is the environment the calves are born into. If the environment is dirty, wet, and/or there is a high pathogen burden, even the best colostrum might not be able to protect the calves from the upcoming pathogenic onslaught. Inversely, calves that have partial and sometimes even complete failure of passive transfer have potential to survive, and in rare cases, thrive in a clean, dry environment. Remember that the cow's body and udder are also components of the environment. If a cow's udder is dirty, and she is placed in a brand new barn, on a brand new concrete slab, with 2 feet of fresh straw bedding, the environment is still highly contaminated. The udder is the first and most important destination for the calf, and if it's sucking on manure in its attempt to find the teat, it's already behind in the battle for survival.