NorthWest Veterinary Associates Newsletter

By Dr. Kokaram **October 2010**

Last month we were very fortunate to have Dr. Sam Leadley of Attica Veterinary Associates address us and weigh in on some on-farm calf health issues. One of the topics he touched on at some of these visits was management strategies targeted at prevention of calf pneumonia/respiratory disease (BRD). According to the USDA National Animal Health Monitoring System's Dairy 2007 survey, 22.5% of preweaning heifer mortality and 46.5% of weaned heifer mortality were associated with respiratory disease. Typical costs of raising replacements have soared to as high as between $1600 - $2000 for springers, with general treatment regimens incurring an additional cost of $5 - $10/100lbs body weight depending on the bug being treated. Such odds can cripple a farm's replacement heifer crop; but can be easily minimized through proper management of young stock from birth onwards.

In general, dairy calf respiratory disease is seen between 2 - 6 months of age; although some farms have experienced outbreaks as early as within the first 2 weeks of life. A variety of bacteria and viruses have been associated with BRD. However, as Dr. Leadley stressed during his visit, good prevention of BRD in youngstock begins at the start, with good colostrum administration and thus passive transfer of immunity to the calf. Administration of an adequate amount of good quality colostrum (3-4 quarts, measured with a colostrometer) within the first 1-2 hours of life is essential to ensuring good transfer of immunity to the calf. Failure of passive transfer of immunity is the number one way in which a calf's immune system can be set up to fail in the ensuing weeks to months.

For those that do feed maternal colostrum to youngstock, all colostrum has value; provided it is obtained from individuals (heifers or cows) that have been boostered at least 1-2 months pre-calving with an appropriate vaccine against IBR, BRSV, PI_3, and BVD such that colostral antibody levels are sufficiently high to help calves resist respiratory challenges. Measuring colostral quality with a colostrometer is perhaps the best on-farm means of assessing colostral quality from both heifers and cows. However, collecting high quality colostrum from our well vaccinated dams is half the battle; we need to ensure that we collect our colostrum cleanly and handle it appropriately once collected.

Some common mistakes include, compromised collection technique and handling leading to the formation of "bacterial soup" and improper pre-feeding technique leading to feeding colostrum of significantly inferior quality. In the first case, one ought to exercise the same care with colostrum collection as with milking in terms of sanitary prep and protocols. Once the colostrum has been collected from clean udders at first milking, it can remain in the fridge for up to 1 week, or may be frozen and stored for several months. Neglecting to cool the colostrum soon after collection will lead to bacterial growth that is exponential with time.

The second situation is one of our most common on farm dilemmas, too much to do, too little time, too few people. In many cases, we try to accelerate colostrum thawing by placing the frozen colostrum in a water bath that is too hot and end up "cooking" the antibodies we so carefully tried to prime our colostrum with in the first place. Colostrum heated at temperatures over 145-150 degrees for extended periods will destroy the antibody content of

the colostrum and significantly reduce our quality very rapidly. That being said though, pasteurization (involves heating colostrum to 140-degrees for 30 minutes) has been shown to significantly reduce bacterial loads, and have an apparent enhancement of passive transfer of immunity.

In the case of situations where colostrum quality, collection and handling are issues, colostrum replacers and supplements have proven to be an extremely good way to ensure that calves have appropriate protection in the early part of life. In choosing one of these colostrum replacers, one ought to choose a replacer with at least 100g of globulin proteins; while many supplements cannot be given with colostrum but rather, need to be given before or after administration to allow proper absorption.

An additional site of intervention in the respiratory disease timeline would be at the calf level in terms of vaccinations at birth. Research indicates that newborn calves are fully capable of responding to intranasal and oral vaccination against viral pathogens at birth. Additionally, calves that have had inadequate transfer of immunity due to various reasons as hard pull, born in inadequate facilities (i.e. dry cow pen), poor colostral quality or no colostral administration, may benefit from vaccination against such viral pathogens as IBR, BRSV, PI_3, Coronavirus in particular.

We can however do all of these things and still fall short if our calves still end up with an overwhelming challenge from these infectious agents, or have compromised respiratory defenses overall. Poor ventilation have a two fold effect on calf health; elevated bacteria counts in the air, and disruption of respiratory mechanical defenses designed at keeping infectious particles from access to the lungs. Thus, we end up with a massive pathogen load in an environment that interferes with the calf's ability to keep them from access to the lungs leading to chronic respiratory issues and poor health. Poor sanitation in calving facilities also contribute to the infectious challenge to the calf and puts further strain on the calf and our management systems. One virus in particular that has come to the forefront of calf BRD is Coronavirus (typically associated with calf scours) which calves are exposed to at birth especially if born in less than sanitary conditions. This particular virus has a liking for the cells that line the respiratory tract and gut and may interfere with the mechanical defenses of the respiratory tract predisposing to the development of chronic BRD issues.

As one can see, the management of calf BRD can be a quite complicated process, however, if we administer adequate amounts of good quality colostrum, in a timely fashion following birth, and house our calves in an environment that reduces the level of stress placed onto the individual, management of BRD becomes a much simpler and less costly proposition.