AGRI-VIEW

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Antibody therapy aids in early calf health success

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A newborn calf is an example of many achieved goals and sound breeding strategies on a dairy operation. Though the successful birth completes a series of objectives, new goals must quickly be formed and followed as the first few hours of a calf's life will determine its long-term productivity to the milking herd.

Young calves are susceptible to enteric and respiratory infectious diseases because they are born without active immune systems. The cow provides the calf with nutrients for growth and development during gestation, but she cannot directly offer the calf antibodies to protect it from diseases postpartum. For that reason, it is vital for calves to receive antibodies immediately after birth.

When the calf drinks colostrum, the maternal-derived antibodies are absorbed from the calf's gastrointestinal tract into the blood stream. According to researchers at the Oklahoma Cooperative Extension Service, a percentage of the immunoglobulins (IgGs) found in the colostrum remain in the gut where they can neutralize pathogenic bacteria and help prevent the development of scours.

The absorption of antibodies from the gastrointestinal tract into the bloodstream is called passive transfer. A successful passive transfer will only occur if the calf consumes a minimum of 100 to 150 grams of IgGs.

Reaching the recommended level of antibodies in a timely manner can be challenging as the pathway between the gastrointestinal tract and the bloodstream closes quickly. In fact this pathway starts to close shortly after birth. Research shows that by eight to 12 hours after birth, 50 percent of the calf's ability to absorb colostrum antibodies is gone. To ensure that the vital antibodies are absorbed, calves should receive at least 4 quarts of high-quality colostrum within the first six hours of life—with the greatest levels absorbed immediately after birth.

It's not just quantity of antibodies that's critical for a calf's healthy start—it's also the type of antibodies that are present which makes a big difference in if that calf is protected. If the maternity pen is contaminated with *E. coli*, the calf will need to consume *E. coli* antibodies to protect against the pathogen. Similarly, if the calf pens are exposed to coronavirus, there needs to be a higher proportion of coronavirus antibody within the calf to fight off that disease.

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Unfortunately, colostrum does not come with a label guaranteeing its nutrient and antibody profile. Though a producer may feed the correct levels of colostrum within the required time period, a calf may not receive adequate immunity if the colostrum quality is not up to par. Colostrum quality can be impacted by: cow nutrition, health history, time of milking, heat stress and stage of lactation.

The culmination of several variables can result in decreased calf immunity, hindering calf health from the start. In fact, a recent study from Iowa State University at Ames estimates a minimum of 30 percent of U.S. dairy calves are currently being fed colostrum classified below industry standards for IgG content. Additional studies at Washington State University pinpoint a percentage closer to 50 percent.

To make up for low colostrum quality, producers can insert various programs and protocols into their calf raising strategies. Because pre-calving vaccination programs depend heavily on the health of the cow, and the efficacy of newborn calf vaccines can be delayed by maternal antibody interference, supplying immediate protection antibodies is the most effective option.

USDA approved colostrum-derived antibody products complement colostrum feeding as they can be fed at the same time as colostrum and do not require the calf to react to a vaccine.

Producers can supplement colostrum with the product that is available in bolus, gel and powder forms. The antibodies are also available in some colostrum replacer and supplement formulas. Each form contains antibody levels measured and verified to be at a high enough level to protect the calf from scours related diseases.

The products can be fed to the calf immediately after birth to enhance passive transfer. Once ingested, the antibodies go directly to the calf's gut where they bind and neutralize scours antigens while also being absorbed into the blood stream for extended protection.

The added immunity provided through colostrum supplementation helps the calf to defend against pathogens throughout its life.

Research shows that if a calf does not achieve an adequate serum IgG concentration at 24 hours of age, it is up to 9.5 times more likely to become ill and 5.4 times more likely to die before weaning.

One dose of these easy to administer antibody products delivers immediate protection that will prevent calf scours outbreaks and potential respiratory issues.

With the assistance of a veterinarian, antibody supplement programs can be formed that reduce labor, risk and subsequent treatment costs and help producers set additional goals for the next generation of their herds.

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