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Contact: Kathy Becher, ImmuCell Corp.
kbecher@immucell.com, (800) 466-8235

Colostrum Research Shows Scours-Vaccinated Cows Produced Insufficient Antibody Levels

PORTLAND, MAINE [September 23, 2020] – Independent researchers* recently measured colostrum from scours-vaccinated cows for general antibody levels needed to achieve successful passive transfer, plus for specific antibody levels needed to maximize immunity against scour-causing pathogens. In samples meeting the industry standard for general mass of antibody (50g/l antibody, also referred to as immunoglobulins), results showed only 1% of cows had high concentrations of specific coronavirus antibodies, 3% were high in rotavirus antibodies and 7% provided colostrum that was high in *E. coli* antibodies.

"To achieve successful passive transfer, newborn calves need a high level of general antibodies. But that's often not enough to prevent scours," says Bobbi Brockmann, Vice President of Sales and Marketing with ImmuCell. "Calves also need elevated levels of specific antibodies to maximize immunity against scour-causing pathogens. Traditionally, farmers have relied on pre-calving scour vaccines to increase antibody levels in colostrum to protect against common scour-causing pathogens. These vaccines require the already immunosuppressed pregnant cow to mount an immune response and then transfer those specific antibodies into

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colostrum. Unfortunately, a vaccine response rate is inherently variable and protocol drift increases that variability, creating an even bigger gap between what farmers pay for and the calf protection they actually get."

The study analyzed 97 single-cow colostrum samples taken from 10 well-vaccinated herds (8 to 10 samples per herd), comprised of farms in California, Idaho, Michigan, Ohio, New York, Pennsylvania and Texas. Each herd had been using a dam-level vaccination program according to label recommendations for more than three years. Researchers collected first-milk colostrum post-calving from only multiparous cows, and then used Bethyl Laboratories assays to measure general antibody mass, virus neutralization assays to quantify specific antibody titers against coronavirus and rotavirus, and a USDA-approved titer assay to determine specific *E. coli* antibody levels.

Figure 1 shows each cow's colostrum relative to mass of antibody and titer level against coronavirus, rotavirus and *E. coli*. The red lines distinguish the quandrants. According to the results, almost half of the cows sampled provided colostrum which fell in all three "low : low" quandrants, indicating that the colostrum was low in general mass of antibody and specificity against coronavirus, rotavirus and *E. coli* pathogens.

The results also showed that an extremely low number of cows provided colostrum in the "high : high" quandrant, with only 1% for coronavirus, 3% for rotavirus and 7% for *E. coli* antibody.

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"Vaccination is simply the act of administering a vaccine. These numbers confirm that immunization is not a guaranteed outcome with vaccination, and calves are left unprotected against scour-causing pathogens," states Brockman. "Despite increased adoption of pre-calving scour vaccines since the 1970s, scour incidence has not improved, likely because of extreme variability. Farmers and veterinarians are seeking alternative treatments that deliver guaranteed levels of specific antibodies – without a vaccine."

During a recent immunology symposium, Dr. Chris Chase, Department of Veterinary and Biomedical Sciences at South Dakota State University, highlighted the use of preformed antibodies to immunize newborn calves against scour pathogens. According to the SDSU professor, these antibodies protect against both bacterial and viral scours. "With vaccines, there are too many outside factors, making a 100% immunization response rate biologically impossible," says Dr. Chase. "But with a USDA-approved antibody product, farmers know exactly what they're getting – a level of immunity proven in third-party studies to protect against scours."

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* Research, Technology, Innovation, LLC. *Colostrum, as an effective mechanism, needs both a shotgun and a sniper in its artillery: How colostrum quality and specific antibody levels against scour-causing pathogens fall short even within well vaccinated herds* [White paper].