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The Colostrum Counsel

In pre-weaned dairy calves, inclusion of a colostrum replacer powder to the milk replacer for 14 days showed positive results in reducing incidence of diarrhea, respiratory disease, depression and umbilical disease. Use of antibiotics was significantly less for those receiving the colostrum replacer supplement.

Effect of colostrum replacer supplementation on the dairy calf health and antibiotic use

Alternatives to antibiotics are a global concern

Results from previous and current research have indicated that supplementing calves with maternal colostrum or a colostrum replacement product after 24 hours of life improves overall dairy calf health and reduces the use of antibiotics during the pre-weaning period (Berge et al., 2009; Chamorro et al., 2016). Recently, regulatory agencies from the United States and Europe have increased restrictive measures in the use of antibiotics in major food producing animals; however, the development of new antimicrobials for livestock species is negligible and morbidity and mortality losses associated with infectious disease are still common among livestock operations worldwide. Therefore there is an evident need on the development of alternatives to reduce antibiotic use in major food producing animal species such as cattle.

In a recent study published at the Journal of Dairy Sci.[1] we were able to demonstrate the beneficial effects of supplementing a commercial colostrum replacement product (CCT-HiCal, SSCL, Saskatoon, Canada) in the milk replacer ration of pre-weaned dairy calves on occurrence of disease and reduction of antibiotic use.

Study design - for 14 days, one group received milk replacer only, the other group received colostrum in the milk replacer twice daily

Two hundred and two 1-d old Holstein dairy calves were assigned to 1 of 2 groups after arrival to a dairy calf rearing facility. Calves assigned to the control group (n=100) received milk replacer (28% crude protein and 20% crude fat) without colostrum inclusion twice daily. Calves assigned to the treatment group (n=102) received 150 g of supplemental colostrum replacer powder (CCT-HiCal) containing ≥20 g of IgG added to their milk replacer twice daily for the first 14 d of life.

Before group assignment, serum samples were

collected from all calves to confirm transfer of passive immunity. Calves were evaluated daily until weaning (56 days of life) for signs of clinical disease as well as any treatment with antibiotics. Presentation of clinical disease and antibiotic treatment was recorded daily by personnel blinded to treatment allocation. All calves had adequate transfer of passive immunity (serum IgG > 10 g/L) and most calves had excellent transfer of passive immunity (serum IgG > 15 g/L at 24 h).

Results - colostrum supplemented calves were better protected against diarrhea, respiratory disease and umbilical disease

For calves that received the colostrum replacer powder supplement the probability of having diarrhea, respiratory disease, depression, and umbilical disease was 85%, 54%, 79%, and 82% lower, respectively, than that of calves that did not receive the colostrum replacer powder supplement. This indicates a protective effect of the colostrum replacer powder supplement in the occurrence not only of diarrhea but also of respiratory and umbilical disease.

Additionally, these results also suggest that achieving high levels of IgG from maternal colostrum does not always result in complete protection against infectious pathogens and that factors such as pathogen pressure and specific immunity might play an important role in clinical protection of disease.

Antibiotic use for colostrum supplemented calves was lower than control calves

With respect to antibiotic use, the probability of receiving at least one treatment with antibiotics for calves that received the colostrum replacer supplement was 93% lower than that of calves that did not receive colostrum replacer. This indicates a major effect of the colostrum replacer supplement in the reduction of antibiotic use in supplemented dairy calves.

Why is colostrum beneficial after day 1?

We believe local and possible systemic effects of some of the components of the colostrum replacer powder such as lactoferrin, TNF-α, epidermal growth

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What is a Veterinary Biologic?

Veterinary Biologics are typically defined as "animal health products such as vaccines, antibody products, and in vitro diagnostic test kits that are used for the prevention, treatment, or diagnosis of infectious diseases in animals". Veterinary Biologics specifically stimulate or involve an immunologic response to infectious disease(s) unlike Veterinary Drugs which have a different mode of action. Bovine dried colostrum may be categorized as a Veterinary Biologic, Feed or Feed Additive depending on what country the product is registered or sold in; however, because SCCL manufactures our bovine dried colostrum products in Canada, we are regulated by the Canadian Food Inspection (CFIA), Canadian Centre for Veterinary Biologics (CCVB). Bovine colostrum is sold only as a Veterinary Biologic in Canada and must comply with the regulations and standards for Veterinary Biologics regardless of whether SCCL sells in Canada or exports our calf, lamb and goat products around the world. As a Veterinary Biologic, bovine colostrum is categorized as an antibody product (specifically, Bovine Immunoglobulin G or Bovine IgG) with the claim to "aid in the prevention of failure of passive transfer (FPT)" in newborn calves, lambs or goats.

How is the designation earned?

The facility manufacturing the Veterinary Biologic AND each product produced by the facility requires licensing by the CFIA-CCVB. Facility or Establishment Licenses and Product Licenses are required to be renewed on an annual basis once initial approval is granted. To gain licensure, a comprehensive application must be submitted, reviewed and approved by the CFIA-CCVB that proves each product meets the requirements of purity, potency, safety and efficacy in the target species and according to the label's directions before the product can be sold

factor, IL-6, and IL-1β could have provided additional protection through better immune responses against enteric and respiratory pathogens in supplemented calves. The reduction in the overall occurrence of disease in supplemented pre-weaned dairy calves likely resulted in a reduced need of antibiotic treatment. Although colostrum replacement products have been advocated as an alternative to prevent failure in the transfer of passive immunity in calves when availability of maternal colostrum is low or when quality of maternal colostrum is compromised due to low IgG levels or the presence of colostrum-borne pathogens their use post-gut closure after day 1 of life has not been fully investigated.

Based on results from this study, this dried-colostrum colostrum replacement product (CCT-HiCal) could be used as a supplement of the milk replacer diet to decrease morbidity and the associated need for antibiotic therapy in pre-weaned dairy calves irrespective of their status in the transfer of passive immunity.

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Manuel obtained his DVM from the National University of Colombia in 2003. Following four years of private dairy practice in Colombia, Manuel moved to the U. S. to pursue an internship in Food Animal Medicine and Surgery at Kansas State University. After finishing his internship in August 2008, he joined the food animal section of Auburn University as a Resident of Food Animal Internal Medicine. In 2011, Manuel finished a Masters program in BVDV and became board-certified as a Diplomate of the American College of Veterinary Internal Medicine in large animals. He worked as a clinical lecturer in food animal medicine and surgery at the Large Animal Teaching Hospital at Auburn University while finishing his PhD in infectious diseases of cattle with particular emphasis in calf immunology, colostrum-derived immunity, and response to vaccination.

References:
1. Chamorro, et al. J. Dairy Sci. 100 2017 2016-11652, Evaluation of the effects of colostrum replacer supplementation of the milk replacer ration on the occurrence of disease, antibiotic therapy, and performance of pre-weaned dairy calves.

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or distributed in Canada or exported around the world. The manufacturing facility or establishment must undergo a comprehensive on-site inspection including contract facilities that are used for testing, packaging, storage or contract manufacturing of the finished product. This establishment pre-licensing inspection is performed the CFIA-CCVB, and physical and administrative inspections are also required on an on-going basis of the licensed establishment and their contracts to maintain both Establishment and Product licenses. Currently, SCCL is inspected by the CFIA-CCVB at a minimum of every 12 months.

What criteria do Veterinary Biologic products need to meet to earn it?

Colostrum as a Veterinary Biologics must meet requirements to ensure that it is pure or free from defined micro-organisms with specific specifications or limits and with tests approved by the regulatory authority; that it is potent and the active ingredient or Bovine IgG is functional and present at the indicated amount that has been proven to be effective; that it is safe to use in the target species and should not cause unwarranted reactions; and that it is effective and provides the protection or benefit that is expected and stated by the approved claim when used as directed. Each of the purity, potency, safety and efficacy of a Veterinary Biologic must be proven to the regulatory authority prior to licensing by submitting robust research data, test results and observations that are reviewed by the regulatory authority and measured against a defined set of standards or requirements.

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