# Research Bits – Calf and Heifer Management

September 22, 2022

Our experts participate in conferences around the world to keep up with new knowledge and tools developed in dairy production. Here are four innovative research projects focusing on calf rearing from the 2022 American Dairy Science Association annual meeting.


How can you turn poor quality colostrum into good quality colostrum?

Sometimes, despite our efforts, it is hard to have enough good-quality colostrum (> 50g immonuglobulin G (IgG)/L or >21% Brix) for our dairy calves. So, what to do with lower-quality colostrum? Recent research led by researchers from University of Guelph (Lopez et al.) suggested that low-quality colostrum could be enriched with dry colostrum replacer. This group investigated the effect of adding dry colostrum replacer (550 to 600 g) to low and good-quality (30g IgG/L and 60g IgG/L respectively) maternal colostrum and feed them to two groups of calves. In addition, three other groups of calves were fed unsupplemented maternal colostrum of either low, good, or excellent quality (90 g IgG/L). The five groups of calves were fed 3.8 L of colostrum total. The investigators analyzed the serum IgG levels and reported that the highest concentration was achieved by calves consuming the excellent maternal colostrum (35.7 mg IgG/mL), followed by those fed the unsupplemented good-quality maternal colostrum (24.2 mg IgG/ml). Adding colostrum replacer to the good-quality maternal colostrum did *not* increase serum IgG levels compared to its unsupplemented counterpart. Calves receiving the unsupplemented low-quality colostrum had the lowest serum IgG levels (11.8 mg IgG/ml),

however adding the colostrum replacer to it allowed calves to improve their IgG levels (19.9 mg IgG/ml).[1]

### Reducing severity of a calf's diarrhea with colostrum: Is it possible?

Over the years, research has demonstrated the essential role of colostrum to support calf heath and development in early life. On top of these benefits, colostrum supplementation during episodes of scours has shown to reduce the severity, days to resolution and to improve growth, according to researchers from University of Guelph (Carter et al.).

These researchers enrolled calves affected with visible diarrhea and fed them 2.5L (130 g/L) twice daily either with milk replacer (4d) or with a 50:50 milk-colostrum mix (130g/L), for 2 or for 4 days. Calves fed the milk-colostrum mix over the 4 days stopped scouring 1.4 days earlier and grew 98 g/day faster than those receiving milk replacer only. Depending on the accessibility of colostrum replacer and the conditions available to ensure proper mixing and delivery to the affected calves, this therapy could be worth considering on your farm.[2]

### Transition milk to decrease antimicrobial use

A study led by the University of Guelph (Uyama et al.) was performed to estimate antimicrobial use and investigate the relationship with calf management practices in 7,817 pre-weaned heifer calves on 74 dairy farms from 5 Canadian provinces. The researchers visited the participating farms to administer a questionnaire and collect calf health records, and subsequently assessed the relationship of calf management practices with the number of antimicrobial treatments/calf-year. They reported that most of antimicrobial treatments were used to treat respiratory diseases (54%) and that farms in QC had a greater rate of antibiotic use than other provinces. Interestingly, this analysis pointed out that farms that fed transition milk (2-6th milking) had less than half the number of

antimicrobial treatments (3.9 vs 9.3 treatments/calf-year) than those that did not feed transition milk.[3]

### How do a calf's health parameters vary depending on its age and the rate at which it's weaned?

Weaning is a challenging process for dairy calves, particularly when considerable amounts of milk are fed. A study led by researchers from the University of Alberta (Wolfe et al.) examined the effects of calf weaning age (6 vs. 8 wk) and pace (abrupt vs. gradual) on health parameters in dairy calves fed milk replacer (up to 1,200 g/day) in addition to free-choice water, calf starter, and chopped alfalfa hay. They concluded that weaning at 8 weeks improved the maturation of the immune system and health measurements versus weaning at 6 weeks, while gradual weaning allows a better grain intake, rumen development and growth.[4]

*Sources*

[1]2254T – Effects of enriching maternal colostrum with bovine dried colostrum replacer on IgG absorption in newborn male calves.A. J. Lopez*[1], H. McCarthy[1], T. T. Yohe[1], J. Echeverry-Munera[1], M. Nagorske[2], D. L. Renaud[3], M. A. Steele[1]. [1]Department of Animal Biosciences, Animal Science and Nutrition, University of Guelph Guelph, ON, Canada, [2]The Saskatoon Colostrum Company Ltd Saskatoon, Saskatoon, Canada, [3]Department of Population Medicine, University of Guelph Guelph, ON, Canada.

[2]2039M – Evaluating the efficacy of colostrum as a therapy for diarrhea in young calves.H. S. Carter*[1], M. A. Steele[1], J. H. C. Costa[2], M. Nagorske[3], D. L. Renaud[1]. [1]University of Guelph Guelph, ON, Canada, [2]University of

Kentucky Lexington, KY, [3]Saskatoon Colostrum Company Ltd Saskatoon, SK, Canada.

[3]2037M – A cross-sectional study on antimicrobial use and calf management practices in Canadian preweaned dairy calves.T. Uyama*[1], D. Renaud[1], D. Léger[2], D. Rizzo[2], E. Morrison[1], E. de Jong[3], K. McCubbin[3], H. Barkema[3], S. Dufour[4], J. Sanchez[5], L. Heider[5], J. McClure[5], S. LeBlanc[1], C. Winder[1], D. Kelton[1]. [1]Department of Population Medicine, ON Veterinary College, University of Guelph Guelph, ON, Canada, [2]Centre for Food-borne, Environmental and Zoonotic Infectious Diseases, Public Health Agency of Canada Guelph, ON, Canada, [3]Department of Production Animal Health, Faculty of Veterinary Medicine, University of Calgary Calgary, Alberta, Canada, [4]Faculté de médecine vétérinaire, Université de Montréal St-Hyacinthe, Québec, Canada, [5]Department of Health Management, Atlantic Veterinary College, University of Prince Edward Island Charlottetown, Prince Edward Island, Canada.

[4]1165 – Effects of weaning strategies on health, hematology, and productivity in Holstein dairy calves.A Wolfe*[1], P Rezamand[2], B Agustinho[2], D Konetchy[2], A Laarman[1,2]. [1]University of Alberta Edmonton, Alberta, CA, [2]University of Idaho Moscow, ID.

By Rodrigo Molano, Ph. D. – PostDoc

Joining his skills on science and his passion for nutrition, Rodrigo completed his PhD at Cornell University (NY, USA) on refining nutritional requirements of dairy calves and heifers.

Research Bits