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Research

Kryzer, A. A., Godden, S. M., & Schell, R. (2015). **Heat-treated (in single aliquot or batch) colostrum outperforms non-heat-treated colostrum in terms of quality and transfer of immunoglobulin G in neonatal Jersey calves.** *Journal of Dairy Science*. Advance online publication. doi: 10.3168/jds.2014-8387

BACKGROUND: Despite the benefits of heat-treating colostrum, it is a relatively new technique that is not yet widely adopted on commercial dairy farms. Small to medium sized farms may only need a small amount of colostrum on any given day, and commercial batch pasteurizers typically require a minimum batch size of at least 8 to 16 L. Although the Perfect Udder system, first introduced in 2011, appears to be a practical approach for allowing small and medium-sized dairies to heat-treat small volumes of colostrum, the process requires validation to ensure that colostrum is properly heat-treated (i.e., protecting colostrum immunoglobulins while significantly reducing bacterial counts) and that the thawing process does not damage colostrum IgG.

PURPOSE: The objectives were to describe the effects of using the Perfect Udder colostrum management system to heat-treat bovine colostrum on (1) concentrations of bacteria and IgG in colostrum, and (2) efficiency of IgG absorption (%) and serum IgG concentrations in neonatal dairy calves fed colostrums heat-treated using the Perfect Udder system compared with a negative control group (calves fed fresh colostrum) and a positive control group (calves fed traditional batch heat-treated colostrum). A secondary objective was to investigate the effect of storing fresh colostrum by refrigeration versus freezing on colostrum characteristics and on measures of passive transfer in calves.

RESULTS: The overall mean IgG concentration in colostrum was 77.9 g/L and was not affected by treatment. Prefeeding total plate counts were significantly different for all 4 treatments and were lower for heat-treated colostrum compared with fresh colostrum. Total coliform counts were also significantly different for all 4 treatments and were lower for heat-treated colostrum compared with fresh colostrum. Mean 24-h serum IgG concentrations were significantly higher for calves in the heat-treated Perfect Udder bag and heat-treated batch pasteurizer groups compared with fresh frozen and fresh refrigerated groups. Mean apparent efficiency of absorption of IgG was significantly higher for the heat-treated groups. Calves fed heat-treated colostrums experienced significantly improved AEA and serum IgG concentrations.

CONCLUSIONS: Heat-treating colostrum at 60°C for 60 min, using either the Perfect

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Udder bag or batch pasteurizer system, resulted in a significant reduction of colostrum bacterial counts while maintaining colostrum IgG concentrations compared with fresh frozen or fresh refrigerated colostrum. Calves fed heat-treated colostrum experienced significantly improved AEA and higher final serum IgG and STP measures at 24 h of age compared with calves fed fresh colostrum. When fresh colostrum was stored in a refrigerator, significant bacterial growth occurred even when the average storage time was less than 24 h. Storing colostrum in the freezer prevented significant bacterial growth and did not negatively affect colostrum IgG concentrations.

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Hammer, P., Richter, E., Rüsç-Gerdes, S., Walte, H. G., Matzen, S., & Kiesner C. (2015). **Inactivation of *Mycobacterium bovis* ssp. *caprae* in high-temperature, short-term pasteurized pilot-plant milk.** *Journal of Animal Science*. Advance online publication. doi: 10.3168/jds.2014-8939

BACKGROUND: *M. caprae* may be regarded as an emerging zoonotic pathogen in cattle. The Codex Alimentarius prescribes that high-temperature, short-term (HTST) pasteurization of milk should lead to a reduction of pathogenic microorganisms to a level at which they do not constitute a significant hazard for human health. Because of the development of improved methods for the detection of survivors and of more advanced heating technologies, a verification of this requirement for the reduction of pathogenic mycobacteria seemed to be necessary.

PURPOSE: The purpose was to determine kinetic inactivation data to ensure that *M. caprae* is inactivated during heat treatment of milk to an extent that the requirements of the Codex Alimentarius are fulfilled.

RESULTS: The study tested 3 strains of *M. caprae* and 1 strain of *M. bovis*. In preliminary trials at a fixed holding time of 25 sec, the temperature at which significant inactivation occurred was 62.5°C for all strains. The tested strains of *M. caprae* and *M. bovis* showed similar low resistance to heat.

CONCLUSIONS: The authors concluded that the standard HTST treatment should result in substantial reduction of the organisms and thus will far exceed the requirements of the Codex Alimentarius for inactivation of pathogens by this process. Even at the subpasteurization temperature of 65°C, a reduction of at least 4 log₁₀ can be achieved during continuous flow treatment for 35 sec.

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Bartier, A. L., Windeyer, M. C., & Doepel, L. (2015). **Evaluation of on-farm tools for colostrum quality measurement.** *Journal of Animal Science*. Advance online publication. doi: 10.3168/jds.2014-8415

BACKGROUND: Although the correlation between Brix data and RID-determined IgG concentrations has been determined in previous studies, no study has directly compared colostrums IgG concentrations determined by RID to both the colostrometer and Brix refractometer on individual cow samples.

PURPOSE: The objectives of this study were to determine whether the colostrometer or Brix refractometer is better able to determine colostrum quality compared with radial immunodiffusion (RID), and to determine the IgG content of colostrums on Alberta dairy farms.

RESULTS: The colostrometer data were more highly correlated with RID results ($r = 0.77$) than were the Brix refractometer data ($r = 0.64$). Specificity and sensitivity were determined for the colostrometer and Brix refractometer compared with a cut-point of 50 mg/mL IgG as determined by RID. The highest combined value for sensitivity and specificity occurred at 80 mg/mL for the colostrometer (84.1 and 77.0%, respectively) and 23% Brix (65.7 and 82.8%, respectively).

CONCLUSIONS: The authors concluded that the Brix refractometer is a suitable on-farm tool because it is user-friendly and functions independently of colostrum temperature. Although the colostrometer data are better correlated with true IgG values, the user-friendly Brix refractometer is a more specific tool to detect colostrum of adequate quality. This study demonstrates that 23% Brix should be used as the cutpoint for adequate quality colostrum. The colostrometer overestimates IgG content but is still a good tool to use on farm, provided that a cut-point of 80 mg/mL is used.

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Traverse, M., & Aceto, H. (2015). **Environmental cleaning and disinfection.** *Veterinary Clinics: Small Animal Practice*. Advance online publication. doi: 10.1016/j.cvsm.2014.11.011

BACKGROUND: The concept of infection control and prevention in veterinary medicine outside the surgical suite or epidemic disease control/eradication in livestock populations was more or less unheard of until the last 1 or 2 decades. Hospitalized animals are not the same as the general animal population; they are more likely to shed or acquire an infectious agent for a variety of reasons, including stress; immunosuppression; altered nutrition or disturbances to normal microbiota; administration of antimicrobials; being subject to procedures that are known risk factors for infection of various types; concentration close to other animals with similar risk factors. Education of veterinarians and all staff as to the need for thoroughness and vigilance when it comes to cleaning and disinfection is critical to successful mitigation of hospital-associated infection risks.

KEY POINTS:

As in human medicine, hospital-associated infections (HAIs) exist in veterinary medicine and must be subject to control measures.

Environmental contamination with pathogens of concern is widespread in veterinary hospitals and should be an important target of proactive measures to prevent (limit) HAI.

For environmental cleaning and disinfection (C/D) to be effective, all stakeholders should be educated as to the need for appropriate C/D and the participation of all (at any level) should be encouraged to accomplish this goal.

Veterinary practices should seriously consider identifying personnel responsible for establishing infection control practices, establishing monitoring/audit procedures, and determining whether their practice situation warrants proactive environmental surveillance.

More research is required to identify the precise relationship between environmental contamination and HAI and to establish control and surveillance/monitoring procedures of direct relevance to veterinary medicine.

This article will be published in the forthcoming March, 2015 issue of *Veterinary Clinics: Small Animal Practice* which focuses on "Infection Control". Dr. Jason Stull, Assistant Professor within VPM, is a co-editor for this edition.

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Calendar



A full calendar of all upcoming events and continuing education opportunities offered by the College of Veterinary Medicine is available on the website at <http://vet.osu.edu/>

Ohio Dairy Health and Management Certificate Program

Module 4 – Advanced Dairy Cattle Nutrition
March 19-21, 2015

OEFFA Conference 2015

February 13, 2015 – Pre-Conference

Join veterinarians Dr. Päivi Rajala-Schultz and Dr. Luciana da Costa from the Department of Veterinary Preventive Medicine and Organic Valley Cooperative staff veterinarian Dr. Guy Jodarski to learn the basic requirements for good udder health, strategies for managing clinical mastitis, and more.

The *Ohio Veterinary Newsletter* began in October of 1974 as a way for Veterinary Extension to relay relevant information to practicing veterinarians in Ohio. The aim is to communicate pertinent news from the Veterinary Extension Unit; unbiased, research-based information with practical relevance for veterinary practitioners working in food animal, equine, and shelter medicine; and a calendar of upcoming opportunities. Please feel free to provide your feedback and let us know what information is most helpful to you and your practice.

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