

OHIO STATE UNIVERSITY EXTENSION



# OHIO VETERINARY NEWSLETTER

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## Q&A Session

**QUESTION #1:** A large conventional dairy herd (milking approximately 2,000 cows; DC305 is used to keep records) would like to screen all fresh cows for metritis 3 times per week (6, 8, and 10 DIM; each fresh cow would have 3 health screening opportunities). All cows are milked three times per day at approximately 8-hour intervals (6:00 am, 2:00 pm, and 10:00 pm) and headlocks are available in the fresh pen (1-25 DIM). The fresh pen is the first to enter the parlor at each milking time. The TMR is delivered twice per day at 6:00 am and 6:00 pm (feed push up every 2 hours). Due to labor scheduling conflicts and to minimize a drop in DM intake in postpartum cows (e.g., compromise lying time), the owner would like to perform the health screening protocol only during the week days (from Monday to Friday).

**Specific request:** Please develop the protocol (from screening to treatment) for metritis and place it into the calendar week. For this case situation, you can be flexible and schedule cows for metritis screening as "±1 DIM".

- Using the calendar week (5 days), what day(s) of the week would you be screening cows for metritis?
- Which cows and how many would you be screening each day assuming there is an average of 6 calvings per day?
- How many workers are needed to implement the health protocol assuming 1 hour is available for each day?
- How would you print the list of fresh cows by DIM from DC305?

**ANSWER:** The answers will be provided in upcoming newsletters. If you would like to practice, please feel free to submit your responses to [schuenemann.5@osu.edu](mailto:schuenemann.5@osu.edu)

**QUESTION #2:** We lost 14 out of 25 dairy calves around 3-5 days old in the last two months (June and July). The farm didn't have this problem in the past and usually the clinical signs start by calves refusing milk and lethargy followed by rapid death (hours from appearance of clinical signs). Colostrum is harvested from dams after calving (no refrigeration) and approximately 1 gallon is hand-fed to newborn calves using an esophageal tube within 2-8 hours of birth. What could be the potential source of the problem?

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## Location

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**ANSWER:** The top three diseases for pre-weaned calves are septicemia, diarrhea, and pneumonia. Since dairy calves are dying at 3-5 days old and the timing between appearance of clinical signs and death is quite rapid; then septicemia (or bacterial sepsis) is most likely to be the source of the mortality problem. Although newborn calves could be affected by diarrhea and/or pneumonia; the age of calves and clinical signs don't match these two health conditions. By definition septicemia in calves is a systemic infection in which bacteria (e.g., *E. coli*, *Klebsiella* spp) and their toxins access the bloodstream via GI tract (e.g., feeding contaminated colostrum) and/or umbilical cord; which in turn damage vital internal organs causing a rapid death. All calves are born without antibodies (IgG) and typically dams transfer via colostrum the immune defenses (IgG) to the newborn calf during the first hours of life. Although the IgG are absorbed at the GI tract into the bloodstream to provide protection against pathogens, an overload of bacteria present in colostrum could also gain access into the bloodstream causing septicemia. Calf health, growth, and performance rely heavily on colostrum and nutrition management at the farm. Therefore, it is very important the quality (>50 mg/dL), quantity (at least 1 gallon or 4 L), timing of administration (within 3 hours of birth), and cleanliness (minimize bacterial load) of colostrum fed to newborn calves. Failure of passive transfer (IgG) increases the risk calf diseases and mortality as well as reduces body weight gain prior to weaning. When colostrum administration is delayed, the absorption of IgG decreases 3.7 percentage points for every hour after calf birth, contributing to the overall FPT and ability of the calf to fight the infection. All equipment should be sanitized (e.g., bottles, nipples, bucket, and esophageal tubing lines), hygiene practices tighten when harvesting colostrum to reduce bacterial load, and freeze/refrigerate unused colostrum immediately after harvesting. Additionally, feeding equipment (e.g., esophageal tubing line, nipples, and/or bottles) should be discarded and replaced with new items because they could be contaminated with bacteria due to poor sanitation practices. Consult with your veterinarian to develop and/or review the colostrum management protocol to make sure calves are receiving adequate quality and quantity of colostrum within 1-3 hours after birth.

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## Research

Barragan, A. A., Workman, J. D., Bas, S., Proudfoot, K. L., & Schuenemann, G. M. (2016). **Assessment of an application for touchscreen devices to record calving-related events in dairy herds and monitor personnel performance.** *Journal of Dairy Science*. Advanced online publication. doi: 10.3168/jds.2015-10841

**BACKGROUND:** It is common to observe multiple first-calf heifers or multiparous cows calving at the same time in large herds. Although lack of communication at the time of shift change has been associated with stillbirth, the effects of calving rate (number of births per unit of time) and number of workers on compliance with calving protocols and standard operating procedures (SOP) have not been documented. Furthermore, implementing an effective and meaningful recordkeeping system at the cow and herd level is essential, not only to monitor the overall herd performance over time, but also to make any necessary management adjustments.

**PURPOSE:** The objectives were to assess: (1) the effectiveness of a calving training workshop and an application (app) for touchscreen devices to capture calving-related events, and (2) personnel compliance with calving protocols (time from birth to feeding of first colostrum and time that cows spent in labor).

**RESULTS:** Calving personnel reported that the information provided during the training was relevant (agree = 14.3% and strongly agree = 85.7%) and of great immediate use (agree = 33.3% and strongly agree = 66.7%). The presented materials and hands-on demonstrations substantially increased the knowledge level of the attendees (by 23.7 percentage points from pre- to posttest scores). The follow-up assessment with participants revealed that the app was easy to use (91.3%) and that they would continue to use it (100%). Frequency of incorrect ( $r = 0.77$ ) or missing ( $r = 0.76$ ) data was positively

correlated with calving:personnel ratio. Furthermore, calving personnel compliance with calving protocols was significantly different within and between herds.

**CONCLUSIONS:** A calving management workshop substantially increased personnel knowledge and provided relevant information with immediate field application. The app accurately recorded calving-related events and, according to personnel, was easy to use. Additionally, the app may serve as a tool to monitor personnel performance by assessing their compliance with calving protocols such as time from calf birth to feeding first colostrum and time that cows spend in labor. This would allow decision-makers to adjust, reassign tasks, or preplan calving management according to actual calving rate to improve the overall quality of data (frequencies of incorrect and missing data) and calf welfare (survival and performance).

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Miltenburg, C. L., Duffield, T. F., Bienzle, D., Scholtz, E. L., & LeBlanc, S. J. (2016). **Randomized clinical trial of a calcium supplement for improvement of health in dairy cows in early lactation.** *Journal of Dairy Science*. Advanced online publication. doi: 10.3168/jds.2016-10961

**BACKGROUND:** Subclinical hypocalcemia (SCH) as a distinct but related disease entity to milk fever has been recognized more recently and been the focus of much research. The principle of SCH is that below certain thresholds of blood Ca concentration undesirable consequences occur despite an absence of visible signs. Prophylactic Ca supplementation immediately after calving is a common strategy to prevent clinical and subclinical hypocalcemia in parturient dairy cows.

**PURPOSE:** The objective was to evaluate the effect of prophylactic administration of a commercially available injected combination of Ca gluconate and Ca glucoheptonate on the incidence of clinical disease and culling, milk production in early lactation, and probability of pregnancy at first insemination. In addition, the effect of administration of the product on blood Ca concentrations was evaluated at 24 and 48 hours after treatment, in cows without clinical hypocalcemia.

**RESULTS:** For cows that had received 1 injection of Ca before the blood sample at 24 h (n = 95), tCa was significantly higher in the treated cows: mean  $\pm$  standard error,  $2.03 \pm 0.03$  versus  $1.90 \pm 0.03$  mmol/L, accounting for tCa at time of enrollment and a treatment by tCa at enrollment interaction. At 48 h, no significant difference was found in tCa between treatment and control (mean  $\pm$  SE,  $2.12 \pm 0.02$  and  $2.10 \pm 0.03$  mmol/L, respectively). Cows treated with the Ca product were significantly less likely to have received intravenous, subcutaneous, or oral supplemental Ca for exhibiting clinical signs of hypocalcemia than control cows (5.0 vs. 8.4%). No effect was found of treatment on retained placenta, metritis, hyperketonemia, prevalence of purulent vaginal discharge, culling from the herd, early lactation production, probability of pregnancy to first artificial insemination, or time to pregnancy.

**CONCLUSIONS:** The authors concluded that prophylactic use of 2 doses of subcutaneous Ca was effective in modestly increasing serum Ca concentrations in the first day after calving and reduced the proportion of cows that received supplemental Ca because they exhibited clinical signs of hypocalcemia. Under the treatment regimen studied, no effect was found of supplemental Ca on the risk of disease or culling, milk production, or reproductive performance.

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Kamath, P. L., Foster, J. T., Drees, K. P., Luikart, G., Quance, C., Anderson, N. J., ... Cross, P. C. (2016). **Genomics reveals historic and contemporary transmission dynamics of a bacterial disease among wildlife and livestock.** *Nature Communications*, 7(11448). doi: 10.1038/ncomms11448

**BACKGROUND:** In the Greater Yellowstone Ecosystem, brucellosis continues to persist in wild bison and elk, with occasional transmission to domestic bison and cattle. Bison were formerly thought to be the primary wildlife reservoir. Whole-genome sequencing has provided fundamental insights into infectious disease epidemiology, but has rarely been used for examining transmission dynamics of a bacterial pathogen in wildlife.

**PURPOSE:** To evaluate the spatial and temporal dynamics of brucellosis transmission among wildlife and livestock in the Greater Yellowstone Ecosystem.

**RESULTS:** The findings showed that brucellosis was introduced into wildlife in this region at least five times. The diffusion rate varies among *Brucella* lineages (B3 to 8 km per year) and over time. They estimate 12 host transitions from bison to elk, and 5 from elk to bison.

**CONCLUSIONS:** The authors concluded that this study demonstrates the value of whole-genome sequencing and phylodynamics for epidemiological inferences of bacterial pathogens at the wildlife/livestock interface. The results support the notion that free-ranging elk are currently a self-sustaining brucellosis reservoir and the source of livestock infections, and that control measures in bison are unlikely to affect the dynamics of unrelated strains circulating in nearby elk populations.

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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 8 – Organic Animal Health Workshop

Tentative Dates: Aug 25-26, 2016

Columbus, Ohio

*Spots are always available for specific module plan.*

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*Roger Rennekamp, Ph.D., Director, Ohio State University Extension.*

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