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In This Issue

News

eCalving™ app for Touchscreen Mobile Devices

available at www.ecalving.com

Easily Collect and Manage Calving Records in Real-Time

A comprehensive calving management program involves many components, but one of the most important aspects for decision-making is valid and reliable records. Dairymen, consultants, and veterinarians often trouble-shoot calving-related losses within herd; however, the lack of meaningful records makes it difficult to implement effective corrective measures. Keeping accurate and complete records of calving-related events is key to reducing the prevalence of stillbirth around parturition and improving calf development. In many dairy herds there are shared responsibilities for a given task, shift changes, turnover, absenteeism, and the subsequent communication challenges.

Dr. Gustavo M. Schuenemann has developed eCalving™, a touchscreen application (app), for dairy producers and personnel to easily record and manage calving-related records in real-time. The eCalving™ app is currently available for Android devices at www.ecalving.com within OSU Veterinary Extension, and it is free of charge and available for anyone who would like to utilize this tool to aid in their decision-making process. It is important to note that the timing and accuracy of data is always dependent on the willingness/cooperativeness of the individual recording the information. This user-friendly tool requires minimal training to use, but personnel must possess sound knowledge and skills regarding calving and colostrum management (what to look for and why it is important). Training for calving personnel to increase technical knowledge/skills and build teamwork is available from Dr. Schuenemann upon request. The app was designed to benefit herd-specific calving management programs by helping farms keep more accurate and complete records, and to monitor personnel adherence to established protocols and SOPs. The app captures those calving-related events associated with stillbirth and calf development. Novel components of the app include:

1) Login screen for individual herds.
2) Capture of selected calving-related events for both dam and calf (e.g., parity, breed, BCS, hygiene of perineum, calving ease, sex of calf, presentation, personnel).

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Location

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3) Rolling list of active cows with an alarm to monitor calving progress and time in labor.
4) Rolling list of active calves (single or multiple) within 24 h after birth.
5) Colostrum management practices (quality, quantity, time of administration, calf vigor, birth weights, and personnel).

A field study was conducted to assess the effectiveness of the eCalving™ app in dairy herds (Barragan et al., 2015). Calving events collected by personnel (n = 23) from 6 large dairy operations (range: 900–5,000 cows) were recorded. 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 app captured calving events and integrated multiple metrics with personnel performance (accounting for the effect of shift change) such as the dam (e.g., date-time of calving), colostrum (e.g., timing, quality, and quantity) and newborn calf (e.g., presentation, vigor). The follow-up assessment with participants revealed that the app was easy to use (91.3%) and that they would like to keep using it. These findings showed that decision-makers can monitor calving events and losses (magnitude and time) at the farm level while accounting for the effect of management.

Calving is an essential requirement of the production system in which cows initiate lactation and provide the future replacements for the herd. Too often, the success of calving management programs are evaluated only on the basis of calf survival which substantially undervalues other factors contributing to superior management. Economic losses associated with dystocia can have severe consequences in dairy herds. It is known that dystocia increases the risk for stillbirth and maternal injury, leading to increased risk for uterine disease (metritis) and reduced milk yield and reproductive performance of lactating dairy cows (Curtis et al., 1983). Without considering medical and replacement costs, the percentage contribution of the total costs resulting from dystocic births was reported as 41% due to reduced milk yield, 33.4% due to reduced fertility, and 25% due to cow-calf losses (Dematawewa and Berger, 1997). Prevention of stillbirth (calf born dead or died within 24 hours after birth, normal gestation length) at the herd level requires an ongoing and constant effort with effective coordination of the whole system (animals, feed/water, facilities, environment, and personnel).

Considering the diversity of production systems, adoption of herd-specific management practices is critical to prevent calving-related losses (e.g., stillbirth, dam injury, and uterine diseases) without neglecting animal welfare and profitability. When designing calving protocols within-herd, it is important to keep in mind the risk factors associated with stillbirth. Difficult births at calving, backward presentations, calf gender (male), parity (primiparous cows), season (winter and spring), and the time around the shift change (calves born 1 h before and after) of herd personnel have been associated with increased risk for stillbirth (Lombard et al., 2007; Schuenemann et al., 2011; Hunter et al., 2013). For instance, distribution of births with respect to season (daily or weekly birth rate) and the same number of calving personnel might increase the risk for stillbirth because of increased number of cows calving per unit of time and the real possibility of late intervention (unable to assist multiple cows with dystocia at the same time). A proactive calving management program should cover at a minimum the following five areas: (1) nutrition and reproductive management of replacement heifers (from birth to weaning, from weaning to breeding, and from breeding to calving) and dry cows; (2) appropriate calving and colostrum protocols and SOPs; (3) efficient training and re-training of personnel; (4) calving-related records; and (5) adequate facilities. The eCalving™ app addresses point #4 (records) and the data collected can be used to assess the human element associated with points #2 (protocols and SOPs) and #3 (training).

Research

Schewe, R. L., Kayitsinga, J., Contreras, G. A., Odom, C., Coats, W.A., Durst, P., … Erskine, R. J. (2015). **Herd management and social variables associated with bulk tank somatic cell count in dairy herds in the eastern United States**. *Journal of Dairy Science, 98*(11), 7650-7665. doi: 10.3168/jds.2014-8840

BACKGROUND: Diversity in farm size and labor structure makes it difficult to design and apply standardized mastitis control programs across US dairy farms. The effectiveness and consistent application of mastitis control programs depend on dairy personnel. Previous research has shown that farmers' attitudes were significantly associated with increased bulk tank somatic cell count (BTSCC) and incidence of clinical mastitis as much as self-reported control procedures.

PURPOSE: The purpose was to determine the relative and combined effects of herd management and social variables, especially those related to farm labor, on self-reported BTSCC across a broad scope of herd sizes and characteristics. It was hypothesized that farmers' and managers' attitudes, values, and employee management will have at least as large an effect on BTSCC as conventional herd and mastitis management practices.

RESULTS: Herd size ranged from 9 to 5,800 cows. Self-reported 3-month geometric mean bulk tank SCC (BTSCC) for all states was 194,000 cells/mL. Multivariate analysis determined that proven mastitis control practices such as the use of internal teat sealants and blanket dry cow therapy, and not using water during udder preparation before milking, were associated with lower BTSCC. Additionally, farmer and manager beliefs and attitudes, including the perception of mastitis problems and the threshold of concern if BTSCC is above 300,000 cells/mL, were associated with BTSCC. Ensuring strict compliance with milking protocols, giving employees a financial or other penalty if BTSCC increased, and a perceived importance of reducing labor costs were negatively associated with BTSCC in farms with non-family employees.

CONCLUSIONS: The authors summarized that this study confirms the continued importance of several established management practices in addressing mastitis and BTSCC while also demonstrating the significance of several social variables. In particular, issues of employee management and training, as well as values and attitudes regarding mastitis were significantly related to BTSCC among respondents.

ACCESS THE ARTICLE…

Moyes, K. M. (2015). **Nutrient partitioning during intramammary inflammation: A key to severity of mastitis and risk of subsequent diseases?** *Journal of Animal Science*. Advance online publication. doi: 10.2527/jas2015-8945

BACKGROUND: Many diseases often occur as a complex where cows with one disease are at a greater risk of developing a subsequent disease. To the author's knowledge, the risk of subsequent disease for cows with mastitis and inflammation of mammary gland is currently unknown. Several studies evaluating the immunometabolic responses in blood and tissue indicate a link between mastitis and risk of subsequent metabolic disease for cows during lactation. Characterizing the metabolic response of the host during inflammation will lead to new management strategies that prevent or control mastitis thereby reduce risk of subsequent metabolic diseases.

PURPOSE: The objective was to discuss the energetic fuels used by leukocytes and the host metabolic response during mastitis that may link mastitis with the development of subsequent metabolic diseases for dairy cows during lactation.

RESULTS: Glucose and glutamine are the primary fuels used by leukocytes and are essential substrates for optimal leukocyte function. Yet, because these substrates are in high demand to support milk synthesis during early lactation, their supply to leukocytes may be compromised and may partly contribute to immunosuppression observed at this time. Production-related metabolic diseases during early lactation, such as ketosis and hepatic lipidosis, can also adversely affect health and productivity. Risk of subsequent

disease for cows during mastitis has not been fully elucidated. Regardless of stage of lactation and physiological state, increases in circulating non-esterified fatty acids and glucose and decreases in ketones during an intramammary inflammation in dairy cows have been reported. In addition, previous work indicates that hepatic metabolism may be impaired during inflammation.

CONCLUSIONS: The authors concluded that these results indicate a potential link between mastitis and the risk of subsequent metabolic disease for dairy cows during lactation. Immune cells primarily use glucose for the generation of reducing equivalents for phagocytosis or convert glucose to lactate during anaerobic glycolysis. Immune cells primarily utilize glutamine for energy whereas fatty acids are converted to cellular lipids and ketones are not utilized as an energy source. Metabolic changes that occur during the inflammatory response include increased circulating NEFA and glucose, reduced circulating BHB and impaired hepatic function. These responses are similar regardless of stage of lactation and different physiological states. A better understanding of the complex interactions between metabolism and inflammation in blood and peripheral tissue may lead to new strategies to prevent or control mastitis and potentially reduce the risk of subsequent metabolic disease for dairy cows during lactation.

ACCESS THE ARTICLE…

Sá E Silva, M., Susta, L., Moresco, K., & Swayne, D. E. (2015). **Vaccination of chickens decreased Newcastle disease virus contamination in eggs**. *Avian Pathology*. Advance online publication. doi: 10.1080/03079457.2015.1112876

BACKGROUND: Newcastle disease virus (NDV) replication occurs in the oviduct; thus, virus can potentially be transmitted through internal egg components, as well as on the eggshell surface as the latter can become contaminated with virus-laden feces as the egg passes through the cloaca. Vaccination is effective in protecting chickens against mortality and reducing virus shedding, but it does not completely block respiratory and gastrointestinal infection, and challenge virus is often shed through mucosal surfaces. Virus shedding through the egg is an important trade issue, since most countries require assurances that the eggs, both consumable and hatching, and egg products are free from specific pathogens, including Newcastle virus, and the presence of virus in egg components can result in nontariff barriers.

PURPOSE: The objective was to determine if virulent NDV can contaminate eggs and, if so, within which egg component, and if vaccination of hens with a live NDV LaSota strain can decrease the virus contamination in egg components after challenge with virulent NDV. Additionally, a second experiment was performed to determine the site of NDV contamination within the reproductive tract of non-vaccinated hens infected with a virulent NDV.

RESULTS: All vaccinated chickens survived challenge, and the levels of virus shed from cloacal swabs were decreased significantly when compared to controls. In non-vaccinated hens, virus was detected in the ovary and all segments of the oviduct. Yolk, albumen and eggshell surface from eggs laid at day 4 and 5 post-infection by control hens were positive for NDV, but eggs from LaSota vaccinated hens lacked virus in internal egg components (i.e. yolk and albumen) and had reduction in the number of positive eggshell surfaces.

CONCLUSIONS: The authors concluded that the virulent California NDV used in this study replicated in several portions of the reproductive tract of SPF hens after challenge, being a potential source for egg contamination. The use of one or two vaccinations with an inactivated LaSota strain was effective in decreasing the presence of virus on the outside of the egg, and eliminating virus presence in the inside egg components (albumen and yolk), significantly decreasing the threat of virus dissemination through egg products or hatching eggs. For the latter product, the presence of virus on eggshell surface can be further mitigated by washing the egg surface with an approved disinfectant and rinse.

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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 6 – Milk Quality & Udder Health
December 3-5, 2015
Hilton Garden Inn, Columbus, Ohio
Spots are always available for specific module plan.

Organic Livestock and Poultry Health Series

This series provides veterinary CE at no-cost.

Upcoming webinars:

Nutritional Management of Lactating Dairy Cows
November 9, 2015 (12-1 p.m.)

Ohio Dairy Veterinarians

2016 Annual Meeting
Social Media Communications and Interaction of Reproduction, Nutrition, & Genetics
January 7-9, 2016
The Fawcett Center & Hilton Garden Inn, Columbus, Ohio

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