THE PRESIDENT’S MESSAGE

Mr. Cook Goes to Washington ….

This month, the AABP Executive Committee made its annual pilgrimage to Washington, DC to AVMA’s Governmental Relations Division (GRD) office who graciously gave up their time and space to accommodate us. Our mission is to meet with government groups to represent cattle veterinarians’ views and find out about issues that may impact our ability to practice.

Despite the negative opinions about what goes on in DC, the city itself is a great place to visit and it never fails to disappoint. You’ve only to stand on the steps of the Lincoln Memorial and look out over the National Mall to feel just a little bit inspired to do great things.

We had a full day of meetings with a different group every hour. I remember how much my head hurt on my first trip as you sit back and listen to various groups speak in a foreign language built of abbreviations. It still hurts this time around! At one point I was trying to decipher what was being said when in the same sentence someone mentioned – the NAHLN, NAHMS, NARMS, and ARS! Tricky!

First, we heard from Ron DeHaven who gave us an update on AVMA activity. We learned that AVMA will continue to accredit foreign schools and that the new veterinary school in Arizona will shortly be recruiting its first class. The Veterinary Medicine Mobility Act got a lot of attention and is receiving bipartisan support to address a regulation that currently prevents veterinarians from legally carrying controlled substances out in the field. Compounding policy has also received a lot of attention recently and thanks to members of AABP, we will have separate policies for small and food animals, in recognition of the importance of avoiding residues in our patients.

Next we heard from Dr. Gary Sherman from NIFA (National Institute of Food and Agriculture) on the VMLRP (Veterinary Medicine Loan Repayment Program). One hundred and seventy-four veterinarians have been placed in rural areas with the program over the last three years and there are 150 applicants for this year’s round of awards. Funding continues in the President’s budget for 2014, but AVMA continues to work to make the awards tax exempt. Currently the government giveth, and it taketh away…. which significantly reduces the impact of the program. Next step for NIFA will be to try to determine the impact of the program when it comes up for review in 2015.

NMPF (National Milk Producers Federation) has also been very busy with significant updates for their DairyFARM animal care manual and program due out this fall. Many of the changes suggested by the review committee have been retained and the questionnaire has shrunk from 77 to 48 questions, with a shift to more objective outcome assessment – which I was delighted to see happen. An update of their milk residue manual is also due out in November. Of note in their survey data is that only 80% of dairy herds have a VCPR …. food for thought for our profession as we await the Food and Drug Administration (FDA) milk residue survey results. Speaking of which, we heard from FDA on the issue. The revised timeline for release appears to be around August. With 1,918 farms sampled and over 57,000 data points, FDA is being very cautious to present the data accurately and appropriately. We are ready with our response to the release. They have also completed their listening sessions on veterinary oversight of antimicrobial use (specifically in feed and water), to consider changes to the Veterinary Feed Directive. They hope to publish new guidelines this year with a final rule within three years. AABP has had representation at each of the meetings and I am grateful to those that gave up their time to represent us.
We continue to ask Food Safety and Inspection Service (FSIS) to make available listings of meat residue violators to veterinarians and we sought clarification of their guidelines to report ‘sub-violative’ residue levels to producers via the meat packers. We remain a little perplexed!…. and that was just the morning!

During lunch we were updated on current issues the AVMA GRD is dealing with, notably the re-emergence of Preservation of Antibiotics for Medical Treatment Act (PAMTA) – which aims to eliminate the use of antibiotics for non-therapeutic reasons, which AVMA is actively seeking to defeat.

Afterward, Dr. John Zack from USDA Animal and Plant Health Inspection Service (APHIS) scared the pants off us again with the actions that would need to be taken in the event of a FMD outbreak. Despite the excellent preparations that APHIS has made, the logistics of carcass disposal, animal movement, sourcing and administering enough vaccine and the economic losses associated with losing our exports are enough to keep you awake at night. I’ve always said that I’d rather be lucky than good …. some folks say I’ve made a career of it, but this is definitely a situation where we need to continue to be lucky!

The day finished with presentations from National Cattlemen’s Beef Association (NCBA) and their efforts with the OIE Welfare group and an update from the Department of Homeland Security. The new National Bio and Agro-Defense Facility (NBAF) Plum Island replacement in Kansas continues to need funding support, but the project moves forward.

Day 2 was spent visiting each of our Congressmen’s and women’s offices and I had the usual trials and tribulations returning home. Delta decided that I should visit both Detroit and Atlanta on my return to Madison!

Cheers,
Nigel

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| World Association for Buiatrics |
| 2014 Cairns, Australia | July 27 – August 1 |
| 2016 Dublin, Ireland | July 3 – 7 |

DISCLAIMER

The AABP does not take responsibility for information contained in or accuracy of the abstracts published in this newsletter.

AABP Remembers Amstutz

Harold Amstutz, DVM, 93, passed away June 11 and left a veterinary legacy to AABP and the industry. Founder of the AABP Amstutz Scholarship, Amstutz has been instrumental in the formation and success of the AABP since 1966 when he was the newly-formed organization’s secretary-treasurer, and later its first executive vice president. In his academic career at Purdue and The Ohio State University he was legendary for his expertise in bovine internal medicine and cattle lameness problems.

Among other numerous contributions and awards, the prestigious AABP Amstutz-Williams Award was formed to honor Amstutz and Dr. Eric J. Williams and their contributions to AABP, and in 2011 Amstutz and Dr. Dan Upson were the first two recipients of the Cattle Production Veterinarian Hall of Fame.

“With the passing of such a pivotal figure in the history of our organization, it is only right for us to take pause, and reflect on the greatness of the person we have lost” states Dr. Nigel Cook, current AABP president. “To honor him, we sought out some personal memories from AABP leadership, past and present.”
AABP Immediate Past President Dr. Brian Gerloff came to know Amstutz through serving on the Amstutz Scholarship committee. “He was always generous to young veterinarians and students, thoughtful to colleagues, and most of all proud of the legacy that the scholarship represented,” Gerloff says. “His contributions to the profession have been enormous.”

Amstutz was Past President at the time of Dr. Rich Meiring’s first contact with AABP. “Harold served as a role model and mentor for many of us ‘mature’ members,” he explains. “I was fortunate to also know Dr. Amstutz as a clinician and an educator. I know he was especially proud of the student scholarship established in his name and that AABP’s most prestigious award is the Amstutz-Williams Award. His legacy resides not only with AABP but with the many veterinarians he mentored throughout the U.S. and the world. We have lost a friend, colleague, and true gentleman.”

“A person like Dr. Amstutz doesn’t come along very often,” says Dr. Bob Smith, an AABP past president. “He was the pinnacle of integrity and professionalism.” Smith first met him in the mid-1970s when he spoke at a Kansas State student AVMA meeting, and knew him well through his years of involvement with AABP.

“Dr. Amstutz touched countless lives as a teacher, mentor, leader and ambassador for bovine practitioners as he traveled the nation and around the world, a true icon. I appreciate the fact that Dr. Amstutz had the same passion for life and veterinary medicine at 90 years of age as he did when I first met him nearly 40 years ago. He was a classy guy and a great man that set an example for all of us to follow.”

As a young graduate, Dr. Steve Smalley first met Amstutz at the 1972 AABP meeting. “He was among many who influenced my career, although I did not know him well, but we would connect every time I attended AABP meetings,” Smalley recalls sitting next to him at the 2011 Amstutz Auction dinner. “He did not remember me, but when I was bidding on the neckties he was enjoying the escalation of the price. It was fun to watch his reaction and know that money was going to a good cause. I looked on him as one of the original core of the organization with passion to see it succeed, and I am glad to have known him.”

AABP Past President Dr. Keith Sterner knew Amstutz well as a friend and mentor. “When I reflect on those icons of bovine practice that epitomize the very best of our profession, surely the one who comes to mind first is Harold Amstutz,” Sterner recalls. “He was the consummate professional in every sense of the word. He worked tirelessly to improve himself as well as the current and future bovine practitioners of the world. I think that one of his greatest sources of pride was knowing that he had left his fingerprint on the future of bovine practice through the scholarship fund that bears his name. He served as a role model in all aspects of his long and productive life.”

One of the two Canadian AABP Board of Directors members, Dr. Guy Boisclair, notes Amstutz’s impact worldwide. Boisclair joined AABP in 1980 and over the years realized how beneficial the organization has been to his continuing education. “I realize how unifying of a character Dr. Amstutz was with bovine veterinarians all over the world. As Canadians we are fortunate to have been included in the AABP.”

Dr. Patty Scharko, another AABP past president, met Amstutz at her first AABP meeting in 1987 when he was coordinating a lameness seminar. “I approached to ask about handouts and he pulled his chair up for me to sit, listen, and enjoy the talks! We were friends ever since. He was an amazing educator, facilitator, and inspiration.”

Read more about Amstutz’s life and contributions to veterinary medicine at http://www.aabp.org/news/display_news.asp?recnum=284

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AABP Treasurer Search

The current AABP Treasurer, Dr. Brian Reed, will complete his second and final term as Treasurer on December 31, 2013. The Board of Directors is requesting that interested AABP members submit a letter of interest/application and a 2-3 page resume for this position to AABP Headquarters. It is anticipated that the selection will be made by October 1, 2013 to facilitate a transition into full responsibilities by December 31, 2013.

As indicated in Article V, Section 1, Part F of the AABP Bylaws, “the Treasurer must be a member of the Association and shall be appointed by the Board for a three-year term with eligibility to serve two consecutive three-year terms. He/she shall be the custodial officer of the Association and be the custodian of the assets …”. Specific duties are further listed in subsections of Part F. These documents can be found on the AABP website in the Members Section under “Policy and Procedures”. The duties of the position can be found in Section B – Officers and Directors, (pages 4-5) and Section K – Bylaws (page 5).

If you are interested in this position, please submit a letter explaining your interest and qualifications. Also, please include a 2-3 page resume and a list of up to three AABP members who may be contacted for a letter of recommendation. All materials should be sent to Dr. Gatz Riddell at the AABP Office in Auburn, Alabama to arrive no later than July 31, 2013, at mgriddell@aabp.org, P.O. Box 3610, Auburn, AL 36831, or (fax) 334-821-9532.
Highlights of 2013 AABP Beef Sessions

We have a slate of excellent speakers who will present at the 2013 AABP Beef program in four main topic areas: Beef Quality Assurance, antimicrobial management, reproductive technologies and pre-weaning bovine respiratory disease. The Beef Quality Assurance section will be early Friday afternoon with Drs. Dan Thomson, Dave Sjeklocha, and Dave Rethorst presenting information on practical implication of BQA principles in cow-calf herds and feedyards. Late afternoon on Friday, we will have a series of practical topics on antimicrobial management with Drs. Mike Apley, Sjeklocha, and Rethorst, describing their expectations for antimicrobial performance as well as how they put together treatment protocols for their clients.

Saturday morning we’ll hear the latest on cow-calf reproductive technologies including some valuable take-home tools related to records in cow-calf herds from Dr. John Bolinger and the value of pregnancy detection by Dr. Gerald Stokka. Dr. Bob Larson will finish up the morning discussing new information on management practices impacting herd reproductive efficiency. Pre-weaning BRD is a challenging syndrome and Saturday afternoon, we’ll hear from a team of experts (Drs. Russ Daly, Dave Smith, and Amelia Woolums) who have been actively researching and working with multiple ranches to come up with new information on this problem. We should have a great session and look forward to seeing you in Milwaukee.

Dr. Brad White, Beef Sessions Coordinator

Highlights of the 2013 AABP Dairy Sessions

The intent of the Dairy Sessions for the AABP meeting in Milwaukee is to keep with the meeting’s overall theme – “Embracing Challenges, Creating Opportunities”. How do dairy veterinarians remain relevant on dairy farms today and what can we offer our clients and their cattle? Three areas chosen to create opportunities on dairy farms: veterinary oversight of drug use protocols, calf management and milk quality.

The Friday afternoon sessions on oversight include presentations on FDA regulations and appropriate drug use on dairy farms from Dr. Virginia Fajt and a dairy producer’s perspective on veterinary oversight from Bridgewater Dairy Farm owner Dr. Leon Weaver. Dr. Mike Apley will provide an overview of practical pharmacology to help us make appropriate treatment decisions. We also will learn about how to use antibiotics for calf scours with Dr. Geoff Smith and for mastitis with Dr. Pam Ruegg.

The Saturday morning sessions will focus on practical applications for consulting clients on calf management. Dr. Ken Nordlund will present information on ventilating calf barns and Dr. Mark Thomas will present information on group feeding calves as well as how to monitor your calf health program.

Saturday afternoon will focus on milk quality and marketing. Dr. Charlie Hatcher, of Hatcher Family Dairy, will provide expertise regarding direct marketing of milk from the dairy farm and how veterinarians can assist producers in this process. Information on milk pricing and dynamics will be presented by John Guess. We will wrap up with the wisdom of the infamous Dr. Andy Johnson on milk quality.

The dairy sessions will be full of practical information you can take back with you to create opportunities for your practice and your clients. Hope to see you in Milwaukee!

Dr. Fred Gingrich, Dairy Sessions Coordinator

2013 U.S. Veterinary Workforce Study: Modeling Capacity Utilization

On April 16, 2013, the AVMA released its “2013 Workforce Study”. The study was based on the assumptions that practitioners spend 2,313 hours per year in professional activities. Respondents were asked how much productivity could be increased in their practices assuming that (a) there would be no changes in the way the practice is organized, (b) there are no changes in the number of veterinarians and support staff, and (c) there is an unlimited supply of clients and patients. Based on these assumptions, excess capacity to provide veterinary services were calculated for various practices. Equine practice had the highest excess capacity at 23%, followed by small animal at 18%, food animal at 15% and mixed at 13%. Of those responding, 42% of practices responded that their practices were already operating at full capacity.

Other findings of significance are that there will be 3,457 graduates completing their education in 2013. Assuming a retirement rate similar to the present retirement rate and only a 2% increase per year in the annual growth of new graduates, the national supply of 92,000 veterinarians will grow to 95,400 by 2020; 100,400 by 2025; and 108,900 by 2030.
These projections do not include the effect of growth in our profession that may be fueled by the rumored opening of up to four additional veterinary schools in the United States, or the increases that may be in the offing as some schools consider expanding the size of their student body enrollments.

Other key findings include that women constitute 78% of the new graduates, presently make up 50% of the workforce, and that based on the retirement rate of the older veterinary population (predominantly male), women will constitute 71% of the workforce by 2030.

Another way to view the capacity utilization situation is to calculate the number of veterinarians that would be needed to meet the needs of our country if they were working up to capacity. Based on the 2,313-hour work year, it would have required 87,950 full time veterinarians to have met the needs in 2012, or representing a 12.5% excess capacity equivalent to 11,500 veterinarians. For food animal service there is presently a capacity of 11,060 full time equivalents (FTE) that could be met by 9,550 FTE.

The AVMA study suggests that the excesses will continue in the 11-14% range through 2025, (equivalent to 9,300-12,300 veterinarians). Trends of employment and work hours may change these projections, but with the increase in student debt and the stagnating incomes seen in the last few years, it is unlikely that veterinarians will retire earlier or reduce hours worked below the recent trends within our profession.

Those interested in viewing the report and its projections can view the report in the AVMA website www.avma.org/KB/Resources/Reports/Pages/2013-US-Veterinary-Workforce-Study.aspx -Submitted by the AABP Veterinary Practice Sustainability Committee

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Oral Exposure, Reinfection and Cellular Immunity to Schmallenberg Virus in Cattle
K. Wernike*, M. Eschbaumer, H. Schirrmeier, U. Blohm, A. Breithaupt, B. Hoffmann, M. Beer

Schmallenberg virus (SBV), a novel orthobunyavirus, was discovered in Germany in 2011. In adult ruminants SBV causes mild transient disease, but foetal infection can lead to severe malformations. Owing to its recent discovery, the knowledge about the pathogenesis is limited. In this study, two heifers seroconverted after a previous SBV infection and five SBV antibody-negative calves were subcutaneously inoculated, another two animals received SBV orally and three were kept as controls. In naïve cattle infected subcutaneously, viral RNA was detected in serum and blood samples for several days. Seropositive or orally inoculated animals as well as the uninfected controls remained negative throughout the study. Seroconversion was observed only after subcutaneous exposure of the naïve animals to SBV. In lymphocytes from peripheral blood SBV genome was not detected, but the lymphocyte homeostasis in blood was influenced.

* Institute of Diagnostic Virology, Friedrich-Loeffler-Institut (FLI), Suedufer 10, 17493 Greifswald–Insel Riems, Germany

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Antimicrobial Multidrug Resistance and Coresistance Patterns of Mannheimia haemolytica
Isolated from Bovine Respiratory Disease Cases – A Three-year (2009–2011) Retrospective Analysis
B. Lubbers*, G. Hanzlicek

Bovine respiratory disease continues to be the most important ailment of feed yard cattle. While the disease is multifactorial in nature, therapy continues to target the primary bacterial pathogens, Mannheimia haemolytica, Pasteurella multocida, and Histophilus somni. A survey of records from a single diagnostic laboratory was conducted to evaluate the percentage of M. haemolytica isolates that were resistant to multiple antimicrobials and if coresistance patterns could be detected. All susceptibility test results for M. haemolytica recovered from lung tissues of cattle were eligible for inclusion in the survey. There were no isolates over the course of the analysis that were resistant to all 6 antimicrobials, primarily due to a lack of resistance to ceftiofur. In 2009, just over 5% of isolates were resistant to 5 or more antimicrobials (pan-resistant). In
2011, more than 35% of the \textit{M. haemolytica} isolates were characterized as pan-resistant. Significant antimicrobial coresistance patterns were only seen with oxytetracycline and tilmicosin; bacterial isolates that were resistant to either oxytetracycline or tilmicosin were more likely to be resistant to at least one other antimicrobial. \textbf{The mechanisms by which \textit{M. haemolytica} is developing multidrug resistance warrant investigation if antimicrobial utility in the therapy of bovine respiratory disease is to be preserved.}

\footnotesize{* Kansas State Veterinary Diagnostic Laboratory, Department of Diagnostic Medicine/Pathobiology, Kansas State University, Manhattan, KS 67506

\textbf{J Anim Sci}
Vol. 91, No. 4, pp. 1831-1837

\textbf{April 2013}

Effects of Vaccination on the Acute-phase Protein Response and Measures of Performance in Growing Beef Calves

Two experiments were conducted to evaluate the influence of vaccination on the acute-phase protein (APP) reaction (Exp. 1 and 2) and measures of performance (Exp. 2) in growing beef calves. In Exp. 1, the APP reaction was assessed in newly weaned steers administered 1 of 3 treatments (\(n = 8\) steers/treatment), consisting of 1) \textit{Mannheimia haemolytica} vaccine (One Shot; Pfizer Inc., New York, NY), 2) \textit{Clostridium} vaccine (UltraBac 7; Pfizer, Inc.), or 3) saline-injected control. Blood samples for the evaluation of APP concentrations were collected on d 0, 1, 3, 5, 7, 10, and 14 and steer BW measured on d 0 and 21 relative to treatment administration. Plasma concentrations of haptoglobin (Hp) increased (\(P < 0.05\)) in vaccinated but not control calves and reached a peak on d 3 and 5 for steers receiving \textit{Mannheimia haemolytica} and \textit{Clostridium} vaccine, respectively. Plasma concentrations of ceruloplasmin (Cp) and fibrinogen (Fb) increased (\(P < 0.05\)) in all calves after treatment administration and Fb concentrations were greatest (\(P < 0.01\)) in calves receiving \textit{Mannheimia haemolytica} vaccine on d 3 and 5 compared with the other treatments. There were no treatment effects (\(P = 0.44\)) on 21-d steer ADG (0.43 kg/d; SEM = 0.082). In Exp. 2, 23 heifers were randomly assigned to 2 treatments: 1) vaccinated (\textit{Mannheimia haemolytica} vaccine One Shot; \(n = 12\)) and 2) saline control (\(n = 11\)). After vaccination, blood samples were collected for determination of APP concentrations on d 0, 3, 6, 9, 12, and 15. During this period, individual heifer DMI was measured using an automated feed intake measuring system (Model 4000E; GrowSafe Systems Ltd., Airdrie, Alberta, Canada). Initial and final shrunk BW did not differ (\(P > 0.36\)) among treatments. On d 1, plasma Cp concentrations increased (\(P < 0.01\)) sharply in vaccinated heifers but not control heifers and were greater (\(P < 0.05\)) in vaccinated vs. control heifers on d 3, 6, 9, and 12 relative to injection. Daily DMI did not differ (\(P = 0.66\)) among treatments (average = 9.1 kg/d; SEM = 0.34); however, ADG and G:F were greater (\(P \leq 0.05\)) for control vs. vaccinated heifers (1.14 vs. 0.87 kg/d and 0.13 and 0.10 kg, respectively; SEM = 0.064 and 0.011). These data indicate that within a 2 wk period after vaccination, beef calves experience an acute-phase protein response, which may result in reduced ADG and feed efficiency.

\footnotesize{* University of Florida, Range Cattle Research and Education Center, Ona, FL 33865

\textbf{Prof Anim Scientist}
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\textbf{June 2013}

Effect of Gonadotropin-releasing Hormone in Long-term Controlled Internal Drug-release Protocols on Pregnancy Rates in Beef Heifers Artificially Inseminated after Observed Estrus or Fixed Time
R. Peel*, J. Seabrook, G. Seidel, Jr., J. Whittier, A. Grove, J. Ahola

Beef heifers at 4 ranches were assigned to 1 of 2 estrus synchronization protocols: CIDR Select heifers received a controlled internal drug-release device (CIDR) on d 0, which was removed on d 14, gonadotropin-releasing hormone (GnRH) on d 23, and prostaglandin (PG) F\(_{2\alpha}\) on d 30; and CIDR-PG heifers received CIDR on d 0, which was removed on d 14, and PG on d 30. At 3 ranches (\(n = 264\), Exp. 1), heifers were observed for estrus and AI 12 h after exhibition of estrus (EAI) or were fixed-time AI (TAI) with GnRH at 72 h. Heifers at the fourth ranch (\(n = 320\), Exp. 2) were fitted with estrus-detection patches at PG administration, which were scored 72 h later at TAI. In Exp. 1, the percentage of heifers observed in estrus, variance for the interval to estrus, and the distribution of observed estrus did not differ (\(P > 0.52\)) between treatments. Pregnancy rate to EAI did not differ (\(P = 0.18\)) between treatments (71% for CIDR Select and 59% for CIDR-PG). There was a treatment \times\ ranch interaction (\(P = 0.01\)) for TAI pregnancy rate. Pregnancy rate to EAI was greater (\(P = 0.003\)) than pregnancy rate to TAI (64 vs. 45%). In Exp. 2, estrus-detection patches on heifers synchronized with CIDR Select tended (\(P = 0.08\)) to have less wear than patches on heifers synchronized with CI-DR-PG. \textbf{Fixed-time AI pregnancy rate in Exp. 2 did not differ (\(P > 0.67\)) between treatments, averaging 50\%.} Timed-AI pregnancy rate was greater (\(P = 0.05\)) for heifers with estrus-detection patches that were 50 or 100% color change than for heifers with patches that had no color change. \textbf{Inclusion of GnRH in long-term CIDR protocols did not improve synchrony of estrus or AI pregnancy rates.}

\footnotesize{*Department of Animal Sciences, Colorado State University, Fort Collins, CO 80523

AABP Newsletter
Vol. 6

\textbf{July 2013}
Associations of Risk Factors with Somatic Cell Count in Bulk Tank Milk on Organic and Conventional Dairy Farms in the United States

In the past decade, the demand for organic agricultural products has increased rapidly in the United States and worldwide. Milk quality research is of major interest to both consumers and dairy farmers alike. However, scientific data on milk quality, herd management methods, and animal welfare on organic farms in the United States has been lacking before the research from this study. The objective of this study was to evaluate the association of bulk tank milk somatic cell count (SCC) with management characteristics on organic and conventional dairy farms in New York, Oregon, and Wisconsin. Data from similarly sized organic farms (n = 192), conventional non-grazing farms (n = 64), and conventional grazing farms (n = 36) were collected at a single farm visit. Of the 292 farms visited, 290 bulk tank milk samples were collected. Overall, no difference in SCC was observed between the conventional and organic grazing systems. Two models were created to assess the effects of various management and herd characteristics on the logarithmic transformation of the SCC (LSCC), one using data from all herds and one using data from organic herds only. From the total herd model, more grain fed per cow per day was negatively associated with LSCC, whereas a positive bulk tank culture for Staphylococcus aureus and years that a farmer reported being in the dairy business were both positively associated with LSCC. In the organic herd model, a seasonal effect indicated that LSCC tended to increase in the summer and decrease in the winter. Grain fed per cow per day, the use of anionic salts in transition-cow diets, the use of gloves during milking, and regular use of a quarantine unit at milking were all negatively associated with LSCC. Similar to the total herd model, a Staph. aureus-positive bulk tank culture was positively associated with LSCC in the organic model. Standard plate count was also positively associated with LSCC in the organic model. Several variables that were associated with management using external resources were combined to create an external input score. In the total herd model, use of more external resources was negatively associated with LSCC.

Conventional herds in the study tended to use more outside management resources than organic herds.

*Department of Population Medicine and Diagnostic Sciences, Cornell College of Veterinary Medicine, Cornell University, Ithaca, NY 14853

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Evaluation of a 3M Petrifilm On-farm Culture System for the Detection of Intramammary Infection at the End of Lactation

The purpose of this study was to evaluate a 3M Petrifilm-based on-farm culture system for the detection of intramammary infection (IMI) in low somatic cell count (SCC) cows (<200,000 cells/mL) at drying off. The main objectives were to determine the test characteristics and the predictive values of the Petrifilm on-farm culture system. The ability of dairy producers to correctly classify cows as infected or uninfected based on Petrifilm culture and a set colony count threshold was also assessed. A total of 360 cows originating from 16 low bulk tank SCC (<250,000 cells/mL) dairy herds were enrolled at drying off. Enrolled cows had an expected dry period of 30–90 days, a SCC < 200,000 cells/mL on the last 3 tests prior to drying off, no clinical mastitis in the same time period, and no antibiotic treatment in the last 14 days. Quarter milk samples were collected on the day prior to drying off, and a composite milk sample was created by combining 5 mL of milk from each quarter sample. Composite milk samples were cultured on-farm using the Petrifilm culture system, which provided results within 24 h. Quarter milk samples were cultured in a reference laboratory, and the results were aggregated to the cow level. On the day of drying off, the Petrifilm was read by the producer and cows were classified as positive if ≥ 5 colonies (equivalent to 50 colony forming units/mL) were present. When read by the producer, 47.8% of the cows cultured negative on Petrifilm and were infused with only an internal teat sealant at drying off. The test characteristics of the Petrifilm on-farm culture system were calculated by comparing the producer-derived Petrifilm results to those obtained by standard laboratory culture. The sensitivity and specificity of the Petrifilm on-farm culture system were 85.2% (78.5–90.5) and 73.2% (66.4–79.3), respectively. The negative predictive value of the Petrifilm test system was high (86.6%) when estimated...
using the prevalence of IMI in this data set, and the positive predictive value was moderate (70.9%). An automated 3M Petrifilm reader was used to obtain accurate colony counts. The agreement between Petrifilm results obtained by the producer and those obtained by the automated Petrifilm reader was high, with a kappa value of 0.82 (0.75–0.89).

*Department of Health Management, Atlantic Veterinary College, University of Prince Edward Island, 550 University Avenue, Charlottetown, P.E.I. C1A 4P3, Canada

J Dairy Sci
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**Effects of Meloxicam on Milk Production, Behavior, and Feed Intake in Dairy Cows Following Assisted Calving**
N. Newby*, D. Pearl, S. LeBlanc, K. Leslie, M. von Keyserlingk, T. Duffield

Parturition is a necessary event for production in dairy cattle, and assistance at calving is common. There is limited use of nonsteroidal antiinflammatory drugs for the alleviation of calving pain and a paucity of research on the effects of these drugs on postpartum health and performance. This randomized triple blind clinical trial involved Holstein cows (n = 42) and heifers (n = 61) that experienced an assisted parturition. These animals received either 1 injection of meloxicam (0.5 mg/kg of body weight) or placebo subcutaneously 24 h following calving. Outcome measures included dry matter intake (DMI) and milk production for the first 14 d in milk, blood metabolites sampled over 12 d, health events for the first 60 d in milk, as well as lying and feeding behavior 24 h following injection. Continuous data were analyzed using multivariable regression models. Binary outcomes were analyzed using a mixed logistic model with cow modeled using a random intercept. This study failed to show any significant effects of treatment on DMI, milk production, blood metabolites, or health events. A possible explanation for the lack of treatment differences could be that the meloxicam was administered too late after calving. Meloxicam increased feeding time as well as bunk visit frequency in the 24 h following injection. Regardless of treatment, animals that had retained fetal membranes produced less milk and had higher serum haptoglobin concentrations. Future research is warranted to examine the effects of anti-inflammatory drugs administered closer to the time of calving on health and production.

*Department of Population Medicine, University of Guelph, Guelph, Ontario, N1G 2W1, Canada

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**Herd-level Risk Factors for Hock injuries in Freestall-housed Dairy Cows in the Northeastern United States and California**
A. Barrientos*, N. Chapinal, D. Weary, E. Galo, M. von Keyserlingk

The aim of this study was to investigate the associations between management and facility design factors and the prevalence of hock injuries in high-producing dairy cows in 76 freestall herds in the northeastern United States (NE-US; Vermont, New York, Pennsylvania) and California (CA). One group of high-production multiparous cows was monitored on each farm, and data on management, facility and stall design, and the conditions of the hocks were collected. Focal cows [n = 38 ± 3 (mean ± standard deviation)] were evaluated for hock injuries using a 3-point scale (where 1 = healthy and 3 = evidently swollen or severe injury). Measures associated with the proportion (logit-transformed) of cows having injuries (score ≥2) or severe injuries (score ≥3) at the univariable level were submitted to multivariable general linear models. In NE-US, overall hock injuries increased with the percentage of stalls with fecal contamination [odds ratio (OR) = 1.26; 95% confidence interval (CI) = 1.02–1.54, for a 10% increase], and with the use of sawdust as bedding (OR = 3.47; CI = 1.14–10.62), and decreased with deep bedding (i.e., at least 10 cm depth of any type of bedding; OR = 0.05; CI = 0.02–0.14), use of sand as bedding (OR = 0.06; CI = 0.02–0.15), bedding dry matter (DM) ≥83.9% (OR = 0.08; CI = 0.03–0.20), and access to pasture during the dry period (OR = 0.17; CI = 0.05–0.53). When these variables were submitted to a multivariable model, the presence of deep bedding was the only factor that remained significant, explaining 54% of the variation in overall injuries. Severe hock injuries increased with the use of automatic scrapers (OR = 2.29; CI = 1.11–4.71) and the percentage of stalls with fecal contamination (OR = 1.14; CI = 1.00–1.31, for a 10% increase), and decreased with sand bedding (OR = 0.22; CI = 0.10–0.49), deep bedding (OR = 0.24; CI = 0.11–0.52), bedding DM ≥83.9% (OR = 0.28; CI = 0.14–0.58), and access to pasture during the dry period (OR = 0.42; CI = 0.18–0.97). The final multivariable model, which explained 36% of the variation in severe hock injuries, included the use of automatic scrapers and deep bedding. In CA, stall stocking density (OR = 1.41; CI = 1.00–2.01, for a 10% increase) and poor bedding maintenance (OR = 1.08; CI = 1.01–1.16, for a 2.5-cm decrease in depth of deep-bedded stalls) were associated with an increase of overall and severe hock injuries, respectively. Deep-bedded and well-maintained stalls reduce the risk of hock injuries. Regional variation in risk factors for these injuries should be considered when formulating on-farm recommendations.

*Animal Welfare Program, Faculty of Land and Food Systems, University of British Columbia, 2357 Main Mall, Vancouver, V6T 1Z4, Canada

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Review: New Information on the Protein Requirements and Diet Formulation for Dairy Calves and Heifers Since the Dairy NRC 2001

Research published since publication of the 2001 NRC publication Nutrient Requirements for Dairy Cattle relating to protein needs of calves and heifers was reviewed and compared with requirements from NRC (2001). Experiments used varied intakes or concentrations of CP or varied fractions of CP in the diet relative to energy. Animal requirements were reviewed in 4 categories to identify advances in understanding of nutritional requirements since publication of NRC (2001). Categories included 1) preweaned calves less than 2 mo of age fed milk or milk replacer and starter, 2) calves transitioning through weaning to approximately 4 mo of age fed starter with limited forage, 3) heifers from 4 mo to breeding, and 4) postbreeding age heifers. For calves in category 1, new data estimating optimal ratios of amino acids were identified. For calves in categories 1 and 2, new data estimating optimum ratios of CP to ME were identified but were limited. For heifers in category 3, optimum diet CP:ME appeared similar to NRC (2001). There were no experiments that tested the 70% RDP of CP recommendation for calves in category 3; however, approximately 65% RDP supported more typical dairy heifer ADG than did lower amounts. Few differences from NRC (2001) were found for heifers in category 4. Precision or limit feeding versus more conventional ad libitum feeding programs appears to offer utility to save costs and reduce nutrient and fecal outputs with dietary adjustments to maintain protein intake relative to energy and DMI.

* Nurture Research Center, Provimi North America, Brookville, OH 45309

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