WORLD ASSOCIATION FOR BUIATRICS
WELT-GESELLSCHAFT FÜR BUIATRIK
SOCIÉTÉ MONDIALE DE BUIATRIE
ASOCIACIÓN MUNDIAL DE BUIATRIA

www.buiatrics.com

Newsletter 3 – 2015

Scholarship for young scientists

Deadline: February 29, 2016

Scholarship for young scientists (PhD students) under the age of 35 by courtesy of Dr. Joao Cannas da Silva, president of the Portugues Buiatrics Association.
The World Association for Buiatrics (WAB) is pleased to announce that **18 WAB** Scholarships will be awarded to young scientists of each affiliated and developing countries (B and C category countries).
These scholarships will provide free congress registration for the awarded young scientists.
By offering this scholarship, WAB wishes to contribute to the development of young scientists (PhD students) from all over the world.

Selection criteria:

1. an accepted scientific abstract for oral/poster presentation where the young scientist is the first author
2. a completed application form
3. an institutional certificate

Address for scholarship submission: Prof. Dr. O. Szenci: e-mail: szenci.otto@aotk.szie.hu

XXIX World Buiatrics Congress (WBC) 2016 –

Scientific Topics Announced

The 29th WBC 2016 Organising Committee has released a list of scientific programme topics for the annual Congress in 2016 alongside a number of high-profile keynote speakers. Taking place in the Convention Centre Dublin, Ireland, the Congress has also opened their registration system, with early-bird rates being offered until March 2016.

Over 30 high-profile Keynote Speakers have been confirmed to date, and a large volume of high quality abstracts have been submitted already. You can submit your abstract through the WBC 2016 Website, and abstract submission is due to close on 1st December, 2015. The Congress will be held on 3rd - 8th July, bringing together world experts in cattle health and production systems: latest scientific updates will include the areas of internal medicine, nutrition, animal health economics, sustainable agriculture, biosecurity, reproduction, toxicology, genetics, breeding and a wide range of emerging diseases.

The Congress is expected to attract between 2,500-3,000 delegates attending from academia, research, general practice and government services branches of the veterinary profession as well as leading animal scientists.

'We're going to have the leading global figures in our industry in Dublin, and the education the scientific programme will provide is going to make a genuinely positive impact on the delegates' work and research' said Michael Doherty, Chairperson of the Scientific Committee. 'We've created streams that will address all the urgent issues in the cattle world while also focussing in on the areas of research, like emerging diseases for example, that make up the key elements of our industry. I personally believe, based on the programme so far and the confirmations coming down the line, that this will be a Congress not to be missed.'

For more information on WBC 2016, you can visit www.WBC2016.com or contact the Conference Secretariat at WBC2016@mci-group.com. You can register for WBC 2016 at www.WBC2016.com.

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AABP Embraces Change, Expands Skills and explores Opportunities in the "Big Easy"

The 48th AABP Annual Conference in New Orleans offered veterinarians and others world-class continuing education on bovine medicine.

(AUBURN, Alabama) Sept. 23, 2015 -- It was a successful turnout of veterinarians and veterinary students at the 2015 48th Annual Conference of the American Association of Bovine Practitioners (AABP) Sept. 17-19 in New Orleans, La., last week. The 2015 theme was "Embrace Change, Expand Skills, Explore Opportunities."

A total of 1,396 veterinarians and students, 257 accompanying persons and 380 exhibitor representatives totaled over 2,000 attendees, with attendees coming from 19 countries and four continents. A total of $239,000 scholarships were awarded at this conference. Adding to this year's success were in-depth pre-conference seminars, a new product showcase in the Exhibit Hall, a live and silent auction supporting the Amstutz Scholarship Fund, and over 200 runners at the 3rd Annual 5K Stampede Fun Run sponsored by Boehringer Ingelheim Vetmedica, Inc. which added more than $7,000 to the Amstutz Scholarship Fund.

Immediate Past President John Davidson, DVM, Dipl. ABVP (beef), Boehringer Ingelheim Vetmedica, Inc., Shiner, Texas, said, "This meeting was the strongest in years and a testament to our AABP member veterinarian's commitment to a life of learning. For 50 years, the AABP has been raising the standards for bovine veterinary medicine. I could not be more proud the efforts of the AABP Program Committee for their contributions to this very successful 48th Annual AABP Meeting."

Davidson noted that in addition to an outstanding scientific program, AABP also recognized many of its members for careers spent dedicated to upholding the standards of bovine veterinary medicine. "With hundreds of veterinary students and recent graduates in attendance for these awards, I am very optimistic for our bright future. The service and commitment by our honorees will undoubtedly be carried on by the newer members of our organization."

In addition, AABP has been active in producing business management webinars for bovine veterinarians through its Veterinary Practice Sustainability Committee, offered a hands-on bovine embryo transfer seminar in conjunction with Virginia Tech, and has played a leadership role in conversations around issues of importance to members and animal agriculture including animal welfare, antimicrobial use and resistance, and prudent drug use.

Incoming AABP President Fred Gingrich, DVM, Ashland, Ohio, added, "Our overarching goal for the continuing education content of the program was to focus on the issues that the cattle veterinarian faces on a daily basis. Animal welfare, bovine respiratory disease, practice management, providing new services to clients and current research topics are all important topics for cattle veterinarians. The leadership of AABP has a strong desire to not only advocate for our segment of the veterinary profession on these issues, but also to present continuing education to our members so that they can continue to improve the skills and knowledge that make us an invaluable resource for the cattle industry."

Continuing education included preconference seminars, clinical forums, beef and dairy scientific sessions, special BRD and practice management sessions, research summaries, poster

presentations, practice tips, sessions for veterinary students and new graduates, and a veterinary technician program. Also meeting in conjunction with AABP was the American Association of Small Ruminant Practitioners.

Dairy and beef veterinarians receive top honors at AABP

Prestigious awards were given to several bovine veterinarians at the American Association of Bovine Practitioners 2015 48th Annual Conference in New Orleans.

(AUBURN, Alabama) September 23, 2015 -- The top honor for the Bovine Practitioner of the Year award from the American Association of Bovine Practitioners (AABP) was given to Dr. Steve Lewis, Canyon, Texas, at the 2015 AABP Annual Conference in New Orleans, La., Sept. 17-19. The award, sponsored by Boehringer Ingelheim Vetmedica, Inc., honors a veterinarian in active practice who is active in organized veterinary medicine and who has made significant contributions to bovine medicine.

Several other bovine veterinarians were also honored at the Annual Business Meeting and Awards Luncheon on Sept. 19. They are:

Merial Excellence in Preventive Medicine

This award recognizes recognize individual member practitioners or practices that have developed outstanding preventive medicine programs. Because of differences in management goals and needs, one award is given to recognize an outstanding program for dairy production, and one for beef production. The 2015 recipients are:

- (Dairy) Dr. Daryl Nydam, Freeville, N.Y.
- (Beef) Dr. Arnie Hentschl, Harbor Beach, Mich.

AABP Award of Excellence

Sponsored by AABP, recipients must be involved in teaching, research, industry or government areas. The recipient's professional activities must have had a consistent and direct influence on daily activities of veterinarians in bovine practice. The 2015 recipient is:

- Dr. David Smith, Mississippi State University

Zoetis Distinguished Service Award

The recipient of this award is an individual who, through long and continued service, has promoted the goals of the AABP and whose accomplishments have served as a model for service to bovine agriculture through organized veterinary medicine. The 2015 recipient is:

- Dr. Glenn Rogers, Aledo, Texas

Merck Animal Health Mentor of the Year Award

The recipient of this award is an AABP member who has been engaged in the field of veterinary medicine for at least 25 years and has served as both advisor and role model to pre-veterinary and/or

veterinary students. This award is given to a member who embodies this spirit whether in practice, the clinic, or the classroom. The 2015 recipient is:

- Dr. Dean Christianson, Ashley, N.D.

James A. Jarrett Award for Young Leaders

This award is for a deserving AABP member within 10 calendar years of graduation from veterinary school. Recipients will have given extraordinary service to the AABP in a manner that significantly enhances the mission of the organization. The 2015 recipient is:

- Dr. Elliot Stevens, Lincoln, Neb.

Cattle Production Veterinarian Hall of Fame

The Cattle Production Veterinarian Hall of Fame annually recognizes one beef and one dairy veterinarian for their lifelong commitment to bovine veterinary medicine. This award is sponsored by AABP, the Academy of Veterinary Consultants, *Bovine Veterinarian*, Merck Animal Health and Osborn Barr.

- (Dairy) Dr. Jenks Britt, Bowling Green, Ky.
- (Beef) Dr. Gary Rupp, Oak, Neb.

Almost $300,000 in scholarships/awards given at AABP

The American Association of Bovine Practitioners helps veterinary students and young graduate veterinarians prepare for the future.

(AUBURN, Alabama) September 23, 2015 -- Almost $300,000 in scholarships and other awards were given to veterinary students and graduate veterinarians at the 2015 48th Annual Conference of the American Association of Bovine Practitioners held Sept. 17-19 in New Orleans, La. The awards, funded by AABP members, AABP partners and the AABP Foundation, will enable recipients to further pursue their careers in bovine medicine.

Many scholarships include transportation and lodging to the Annual Conference, and the Bovine Respiratory Disease Symposium has added $15,000 for 2015-2019 to augment the AABP Graduate Student Awards.

Scholarships and awards for 2015 include:

Amstutz Scholarships ($7,500 each)

- Lisa Dauten, Purdue University
- Tyler Grussing, Iowa State University
- Jared Lyzenga, Michigan State University
- Benjamin Potvin, Ontario Veterinary College
- Adlai Schuler, Iowa State University

- Julia Simons, University of Wisconsin
- Ellen Unruh (Ouellette), Kansas State University

Merck Animal Health Student Recognition Awards ($5,000 each)

- Laura Bro, Iowa State University
- Tyson Buyer, Western College of Veterinary Medicine
- Crystal Clark, University of Calgary
- Lisa Dauten, Purdue University
- Amanda Emery, Purdue University
- Callie Garoutte, Iowa State University
- Lindsey Hetrick, Iowa State University
- Kevin Jacque, The Ohio State University
- Blaine Johnson, Iowa State University
- Jared Lyzenga, Michigan State University
- Carl Moore, Cornell University
- Abigail Olson, Washington State University
- Adlai Schuler, Iowa State University
- Ashley Swenson, University of Minnesota
- Melissa Wagner, Ontario Veterinary College
- Jonathan Wesson, North Carolina State University

AABP Foundation-Zoetis Scholarships ($5,000 each)

- Benjamin Baird, Washington State University
- Alex Beck, Washington State University
- Rebecca Calder, Cornell University
- James Coffey, Oklahoma State University
- Julie Conner, University of California-Davis
- Amanda Emery, Purdue University
- Jacob Hagenmaier, Kansas State University
- Jennifer Holle, University of Wisconsin
- Kevin Jacque, The Ohio State University
- Nicholas Lemmel, Colorado State University
- Darcy Messerly, Oklahoma State University
- Kathleen Morriss, Auburn University
- Lacey Robinson, Kansas State University
- Merel Rodenburg, Oklahoma State University
- Lauren Scruggs, Auburn University
- Emily Stayduhar, The Ohio State University
- Peter Strassburg, University of Wisconsin

AABP Foundation-Cargill Scholarships ($2,000 each)

- Alex Beck, Washington State University
- Rebecca Calder, Cornell University
- Jennifer Holle, University of Wisconsin
- Kevin Lavelle, Colorado State University
- Nicholas Lemmel, Colorado State University

2015 AABP Foundation Competitive Research Grants (up to $25,000 each)

- Dr. Theresa Ollivett
- Dr. Colette Cywes-Bentley

2015 AABP Graduate Student Awards ($2,500, $2,000 and $1,500)

1st (tie): Dr. Charlotte Winder, Ontario Veterinary College, University of Guelph
1st (tie): Dr. Amy Vasquez, Cornell University
3rd: Dr. Kaitlynn Abell, Kansas State University

2015 AABP Student Case Competition ($1,500 and $750 for each category)

(Clinical)
1st: Blanca Camacho, UC-Davis
2nd: K.C. VanFleet, Michigan State University

(Research)
1st: Kiley Mettendorf, University of Illinois
2nd: Trisha Collins, Iowa State University

2015 AgriLabs Dr. Bruce Wren CE Awards ($5,000 each)

- (Beef) Dr. Anita Varga, Capay, Calif.
- (Dairy) Dr. Gabe Middleton, Orrville, Ohio.

Visit www.AABP.org to see additional information on the 2015 Annual Conference.

The 2016 49th Annual AABP Conference will be held Sept. 15-17 in Charlotte, N.C. AABP is a membership-based, not-for-profit organization serving cattle veterinary medicine professionals across the United States, Canada and other countries. Visit www.AABP.org.

CONTACT:
Dr. M. Gatz Riddell, Jr.
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Boehringer Ingelheim Animal Health presents its first live web congress on Bovine Viral Diarrhoea

- The congress is broadcasted live from Barcelona on **November 18th at 6 pm CET** via the website http://webcongress.bvdzero.com.
- Five international experts answer the questions of European cattle practitioners.
- Content is provided in six languages simultaneously.

Ingelheim, Germany, 15 October 2015 – Boehringer Ingelheim Animal Health hosts the first live web congress informing about the major cattle disease Bovine Viral Diarrhoea (BVD) on November 18th, 2015. Starting at 6 pm CET, the congress will be broadcasted live from Barcelona via the website http://webcongress.bvdzero.com. The event will focus exclusively on BVD and will feature five international experts with different backgrounds who will share their special insights on the disease.

The goal of Boehringer Ingelheim Animal Health is to connect European cattle practitioners and to provide them with the latest information on BVD. Therefore, access to the web congress will be possible from all parts of the world. The sessions will be held in English and will simultaneously be translated into French, Italian, Spanish, Polish and German. Participation is organised via the www.bvdzero.com website. After clicking on the banner of the web congress a short registration process is required to join the event.

There will be five different presentations during the two and a half hour web cast by the international BVD experts:

- Dr Volker Moennig, Professor emeritus, University of Veterinary Medicine Hannover, Germany
- Dr Robert Fux, Institute for Infectious Diseases and Zoonoses, Ludwig-Maximilians-University Munich, Germany
- Dr Dan Givens, Professor and Associate Dean for Academic Affairs, Auburn University College of Veterinary Medicine, USA
- Dr Jocelyn Amiot, Monestoy Veterinary Clinique, Epinac, France
- Dr James Roth, Director, Center for Food Security and Public Health, Iowa State University, USA

An expert scientific journalist will guide the participants through the web congress interviewing the speakers. Participants will have the opportunity to send their questions to the speakers who will answer them live, right after their presentation.

The web congress will provide a general overview on the disease as well as information on a variety of special topics: BVD in dairy animals, the real role of PI (persistently infected) animals, practical tips on BVD management in the suckling cows segment, and the role of cellular and humoral immunity after BVD vaccination.

"BVD is not a problem of a single country, it is a European and an important worldwide problem", states Volker Moennig. "This web congress is a great opportunity to talk to thousands of vets about the hidden threat represented by BVD." BVD is one of the major cattle diseases with worldwide distribution. The disease is caused by two different types of viruses (BVDV-1 and BVDV-2). BVD can cause a variety of clinical disease syndromes, including immunosuppression, infertility, abortions and congenital defects in calves. Some animals may develop a more severe condition known as mucosal disease, which can cause high mortality in affected animals.

For more information on Bovine Bovine Viral Diarrhoea and on how to manage the disease please visit http://www.bvdzero.com

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2016 Dairy Calf and Heifer Association Conference

Madison, Wis,. USA, April 11-13, 2016

Annual conference will focus on industry challenges, opportunities

Make plans to attend the Dairy Calf and Heifer Association (DCHA) Annual Conference set for April 11-13, 2016 in Madison, Wis.

The people working to raise dairy calves and heifers share unique challenges. Join like-minded individuals for educational presentations about challenges and opportunities in the calf and heifer raising sector along with an industry-specific trade show and farm tours.

Producer panels, presentations and breakout sessions will discuss housing, nutrition, disease management, antibiotic use and the profitability of raising dairy-beef. Other topics will include building client and team relationships and new aspects of animal welfare. A highlight of the conference will be updates on the DCHA's Gold Standards of calf and heifer raising.

The event will include on-farm sessions and tours, as well as post-conference tours and demonstrations at the Wisconsin Veterinary Diagnostic Laboratory and the University of Wisconsin School of Veterinary Medicine.

This unique conference will give attendees opportunities to network with other calf and heifer raisers and service providers. Custom heifer raisers, dairy producers, veterinarians, nutritionists and anyone with a vested interest in raising calves is invited to attend.

For more information about the 2016 Dairy Calf and Heifer Association Annual Conference or to join DCHA visit www.calfandheifer.org, call (855) 400-3242 or email info@calfandheifer.org.

The Dairy Calf and Heifer Association (www.calfandheifer.org) was founded in 1996 based on the mission to help dairy producers, calf managers and those professionally focused on the growth and management of dairy calves and heifers. With a national membership of producers, allied industries and research leaders, DCHA seeks to provide the industry's standards for profitability, performance

and leadership, serving as a catalyst to help members improve the vitality and viability of their individual efforts and that of their business.

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Scientific abstracts

Wiener Tierärztliche Monatsschrift – Veterinary Medicine Austria 2015.102.3-10.

Sporadic bovine mastitis caused by *Nocardia farcinica* and *Mycobacterium smegmatis* in an Austrian dairy herd

M. Baumgartner, V. Urbantke, T. Wittek, J. Spergser

Three cases of a therapy-resistant subclinical mastitis occurred in an Austrian dairy farm in 2013. Mastitis was characterized by a highly elevated somatic cell count. As disease progressed, udders became firmer, milk secretions became watery and atrophy of the infected quarter was observed in one cow. Bacteriological and molecular examinations including 16S rRNA gene sequencing revealed that mastitis was caused by *Nocardia farcinica* (two cows) and by *Mycobacterium smegmatis* (one cow). A galactogen infection is assumed but the reason for the frequent infections is not yet clear. As therapy showed no effect, the infected cows will be removed from the herd.

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Wiener Tierärztliche Monatsschrift – Veterinary Medicine Austria 2015.102.19-28.

Aetiology and clinical and laboratory symptoms in cattle suffering from molybdenum intoxication

T. Wittek, A. Hofbauer, J. Hofer, A. Müller, W. Baumgartner

Introduction

Two farms in Carinthia (Austria) on which animals with high plasma molybdenum (Mo) were detected were chosen to investigate whether the cattle suffered from Mo-induced secondary copper (Cu) deficiency. The aims were to examine the effects of high Mo intake and to identify the sources of Mo.

Materials and Methods

Clinical examinations were performed and blood samples were taken from 43 animals (farm 1: 14 cows, two heifers; farm 2: one cow, twelve heifers, 14 calves) in March 2013 (barn feeding period). Blood samples from eight of the animals were obtained immediately after the cows returned from alpine summer pasture in September 2013. A routine clinical examination and analysis for haematology and trace elements were performed. Samples of grass silage, corn silage, hay and mountain pasture as well as soil and water were analysed.

Results

In March, all animals from both farms showed elevated plasma Mo concentrations (>100 µg/l) and 100% of the animals from farm 1 and 50% of the heifers from farm 2 had plasma-Mo levels > 700 µg/l, which are considered toxic. After summer on the mountain pasture, the plasma-Mo levels were significantly decreased. The only clinical symptom typical of a Mo-induced Cu deficiency was the spectacle-like depigmentation and loss of hair around the eyes in 42% of the adult animals. In March, low haemoglobin concentrations were found on both farms. Additionally, low plasma-Cu levels were detected in 71.4% of the cows (n=14) and 50% of the heifers (n=2) from farm 1 and in 58.3% (n=12) of the heifers from farm 2. Grass silage and hay were identified as sources of Mo. The farms' pastures are situated in a historic mining area. The grass on the alpine mountain pasture had a normal concentration of Mo.

Conclusions

Clinical and laboratory parameters support the diagnosis of Mo-induced Cu deficiency. The animals were in a subclinical stage of molybdenosis. In the light of the finding of Mo-plasma concentrations above the toxic level, it is puzzling that more severe clinical and laboratory signs were not present. A tolerance to long-term exposure of Mo has been reported. The authors recommend a critical review of the reference ranges.

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J Dairy Sci 2015.98.5352-5361.

Assessment of visceral pain associated with metritis in dairy cows

J. Stojkov, M. Von Keyserlingk, J. Marchant-Forde, D. Weary

Metritis is a common disease in dairy cattle, but to our knowledge, no work has assessed pain associated with this disease. Tissue palpation is commonly used to assess pain in human and veterinary medicine. The objective of this study was to evaluate visceral pain responses during rectal palpation, with and without uterine palpation, in healthy cows and in cows diagnosed with metritis. A total of 49 Holstein dairy cows (mean ± standard deviation parity of 2.8 ± 1.8) were subjected to systematic health checks every 3 d after parturition for 21 d, scoring for vaginal discharge (0 to 4); 13 cows showed a discharge score ≥2 during at least 1 health check and were classified as metritic, whereas 29 cows were classified as healthy and showed no sign of this or any other disease (including mastitis and lameness).

Back arch and heart rate variability before examination and during palpation were recorded using video and heart rate monitors. Back arch (cm^2) on the day of diagnosis was greater in metritic versus healthy cows (1,034 ± 72 vs. 612 ± 48 cm^2), and greater during rectal palpation with uterine palpation versus rectal palpation without uterine palpation (869 ± 45 vs. 777 ± 45 cm^2). Heart rate frequency domain analysis showed that the low-frequency portion was higher in cows with metritis versus healthy cows (16.5 ± 1.2 vs. 12.9 ± 1.0). Time domain analysis showed that the standard deviation between normal to normal interbeat intervals and the root mean square of successive differences both decreased during rectal palpation with uterine palpation versus rectal palpation without uterine palpation (1.9 ± 0.1 vs. 2.5 ± 0.1 and 1.3 ± 0.1 vs. 1.7 ± 0.1, respectively). Together, these results indicate that the inflammation associated with metritis is painful, and that the pain response can be detected during rectal palpation with and without uterine palpation. Rectal palpation with uterine palpation appears to be more aversive than rectal palpation without uterine palpation, suggesting that the former should be avoided when possible.

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PLoS ONE10(8): e0136294. doi:10.1371/journal.pone.0136294

Heart rate and heart rate variability in dairy cows with different temperament and behavioural reactivity to humans

L Kovács, FL Kézér, J Tőzsér, O Szenci, P Póti, F Pajor

From the 1990s, extensive research was started on the physiological aspects of individual traits in animals. Previous research has established two extreme (proactive and reactive) coping styles in several animal species, but the means of reactivity with the autonomic nervous system (ANS) activity has not yet been investigated in cattle. The aim of this study was the characterization of cardiac autonomic activity under different conditions in cows with different individual characteristics. For this purpose, we investigated heart rate and ANSrelated heart rate variability (HRV) parameters of dairy cows (N = 282) on smaller- and larger-scale farms grouped by (1) temperament and (2) behavioural reactivity to humans (BRH). Animals with high BRH scores were defined as impulsive, while animals with low BRH scores were defined as reserved. Cardiac parameters were calculated for undisturbed lying (baseline) and for milking bouts, the latter with the presence of an unfamiliar person (stressful situation). Sympathetic tone was higher, while vagal activity was lower in temperamental cows than in calm animals during rest both on smaller- and larger-scale farms. During milking, HRV parameters were indicative of a higher sympathetic and a lower vagal activity of temperamental cows as compared to calm ones in farms of both sizes. Basal heart rate did not differ between BRH groups either on smaller- or larger-scale farms. Differences between basal ANS activity of impulsive and reserved cows reflected a higher resting vagal and lower sympathetic activity of reserved animals compared to impulsive ones both on smaller- and larger-scale farms. There was no difference either in heart rate or in HRV parameters between groups during milking neither in smaller- nor in larger-scale farms.
These two groupings allowed to draw possible parallels between personality and cardiac autonomic activity during both rest and milking in dairy cows. Heart rate and HRV seem to be useful for characterisation of physiological differences related to temperament and BRH.

Reproduction in Domestic Animals 2015.50.735–739.

Reproductive and metabolic responses of early-lactating dairy cows fed different dietary protein sources

V Tufarelli, GM Lacalandra, V Laudadio

Optimal reproduction is very closely tied with optimal nutrition, and early-lactation diets in cows are critical to successful reproduction and monitoring is important. To evaluate the effects of different dietary protein sources on metabolic parameters and reproductive activity, a total of 36 Italian Friesian early-lactating dairy cows were assigned for 16 weeks to three dietary treatments as follow: the control diet contained soya bean meal (SBM) as the main protein source, whereas the experimental diets contained faba bean (FB) or pea seeds (PS) as alternative protein sources. Diets were formulated to be isocaloric and isonitrogenous. Cow blood samples were collected, and plasma were analysed for metabolites, biological enzymes, *β*-hydroxybutyrate (BHBA) and non-esterified fatty acids (NEFA). Feeding alternative protein sources had no effects on most metabolic blood profile, except for blood cholesterol, triglycerides and urea. Results from reproductive parameters indicated that cows fed FB diet had a lower insemination index, but a shorter calving to conception period and an improved conception rate and artificial insemination outcome, when compared to cows fed SBM or PS diets. It can be concluded that replacing conventional dietary SBM with alternative protein sources, especially FB, resulted in improved reproductive performances and metabolic parameters in early-lactating dairy cows.

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Reproduction in Domestic Animals 2015.50.834–839.

Effects of dietary contamination by zearalenone and its metabolites on serum anti-Müllerian hormone: impact on the reproductive performance of breeding cows

Y Fushimi, M Takagi, D Monniaux, S Uno, E Kokushi, U Shinya, C Kawashima, T Otoi, E Deguchi and J Fink-Gremmels

We investigated the effects of *in vivo* exposure to low zearalenone levels on the anti-Müllerian hormone endocrine levels and the reproductive performance of cattle. Urine and blood samples and reproductive records were collected from two Japanese Black breeding female cattle herds with dietary zearalenone contamination below the threshold levels (<1 ppm) at 30 days after calving. Urinary zearalenone, *α*-zearalenol and *β*-zearalenol concentrations were measured by chromatography-tandem mass spectrometry, and serum anti-Müllerian hormone concentrations were determined along with serum biochemical parameters. Urinary concentrations of *α*-zearalenol were significantly higher ($p < 0.05$) in cattle in Herd 1 than in cattle in Herd 2, reflecting the different amounts of zearalenone in the diet of the two herds. Although the number of 5-mm and 10-mm follicles of the herds and their fertility after artificial insemination were similar, the serum anti-Müllerian hormone concentrations in

herds 1 and 2 were 438.9 ± 48.6 pg/ml and 618.9 ± 80.0 pg/ml, respectively, with a trend towards a significant difference ($p = 0.053$), which may indicate differences in the antral follicle populations between herds. Thus, zearalenone intake from dietary feed, even when below the threshold zearalenone contamination level permitted in Japan, may affect the ovarian antral follicle populations, but not the fertility, of post-partum cows.

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Reproduction in Domestic Animals 2015.50.807–811.

Pregnancy rates to fixed embryo transfer of vitrified IVP *Bos indicus, Bos taurus* or *Bos indicus* × *Bos taurus* embryos

LSR Marinho, BV Sanches, CO Rosa, JH Tannura, AG Rigo, AC Basso, JHF Pontes, MM Seneda

The pregnancy rates obtained after the transfer of cryopreserved *in vitro*-produced (IVP) embryos are usually low and/or inconsistent. The objective of this study was to evaluate the pregnancy rates of Holstein, Gyr and Holstein × Gyr cattle after the transfer of vitrified IVP embryos produced with X-sorted sperm. Seventy-two Gyr and 703 Holstein females were subjected to ovum pickup (OPU) sessions, followed by *in vitro* embryo production using semen from sires of the same breeds. Embryos (1636 Holstein, 241 Gyr and 1515 Holstein × Gyr) were exposed to forskolin for 48 h prior to vitrification. The pregnancy rate achieved with Gyr dam and sire was 46.1%, which was similar ($p = 0.11$) to that of Holstein dam and Gyr sire (40.3%). Crossing Gyr dams with Holstein sires resulted in a pregnancy rate of 38.9% and did not differ ($p = 0.58$) from the pregnancy rate obtained with the cross between Holstein dams and Gyr sires. The rate obtained with Holstein dam and sire was 32.5%. The average pregnancy rate was 36.6%, and no difference was found in the proportion of female foetuses (88.8%, in average) among breeds ($p > 0.05$). In conclusion, transfer of cryopreserved X-sorted embryos represents an interesting choice for dairy cattle. Despite the small differences between pregnancy rates, we highlight the efficiency of this strategy for all of the racial groups studied.

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J Dairy Sci 2015.98.7426–7445.

Invited review: Changes in the dairy industry affecting dairy cattle health and welfare

HW Barkema, MAG. von Keyserlingk, JP Kastelic, TJGM Lam, C Luby, JP Roy, SJ LeBlanc, GP Keefe, DF Kelton

The dairy industry in the developed world has undergone profound changes over recent decades. In this paper, we present an overview of some of the most important recent changes in the dairy industry that affect health and welfare of dairy cows, as well as the science associated with these changes. Additionally, knowledge gaps are identified where research is needed to guide the dairy industry through changes that are occurring now or that we expect will occur in the future. The number of farms

has decreased considerably, whereas herd size has increased. As a result, an increasing number of dairy farms depend on hired (nonfamily) labor. Regular professional communication and establishment of farm-specific protocols are essential to minimize human errors and ensure consistency of practices. Average milk production per cow has increased, partly because of improvements in nutrition and management but also because of genetic selection for milk production. Adoption of new technologies (e.g., automated calf feeders, cow activity monitors, and automated milking systems) is accelerating. However, utilization of the data and action lists that these systems generate for health and welfare of livestock is still largely unrealized, and more training of dairy farmers, their employees, and their advisors is necessary. Concurrently, to remain competitive and to preserve their social license to operate, farmers are increasingly required to adopt increased standards for food safety and biosecurity, become less reliant on the use of antimicrobials and hormones, and provide assurances regarding animal welfare. Partly because of increasing herd size but also in response to animal welfare regulations in some countries, the proportion of dairy herds housed in tiestalls has decreased considerably. Although in some countries access to pasture is regulated, in countries that traditionally practiced seasonal grazing, fewer farmers let their dairy cows graze in the summer. The proportion of organic dairy farms has increased globally and, given the pressure to decrease the use of antimicrobials and hormones, conventional farms may be able to learn from well-managed organic farms. The possibilities of using milk for disease diagnostics and monitoring are considerable, and dairy herd improvement associations will continue to expand the number of tests offered to diagnose diseases and pregnancy. Genetic and genomic selection for increased resistance to disease offers substantial potential but requires collection of additional phenotypic data. There is every expectation that changes in the dairy industry will be further accentuated and additional novel technologies and different management practices will be adopted in the future.