



Conference of Research Workers in Animal Diseases

Author Index & Presentation Abstracts

99th Conference of Research Workers in Animal Diseases

December 2-4, 2018

**Chicago Marriott, Downtown Magnificent Mile
Chicago, Illinois**



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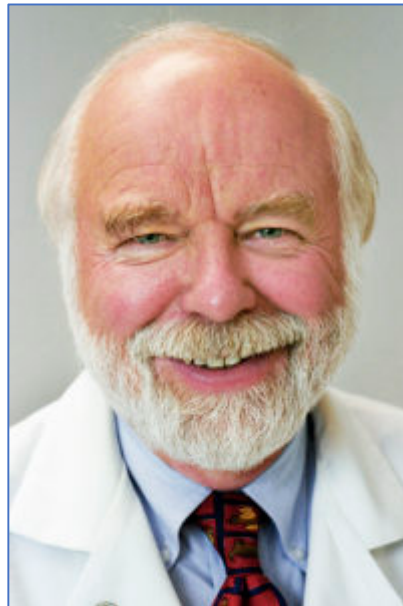
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CRWAD 2018 Dedicatee:



**Ronald D. Schultz, PhD
Professor Emeritus
Department of Pathobiological Sciences
University of Wisconsin**

CRWAD 2018 is dedicated to Professor Emeritus Ronald D. Schultz. Dr. Schultz received his PhD in microbiology at Pennsylvania State University in 1970 under the direction of Dr. Howard Dunne. He held faculty appointments at Cornell and Auburn Schools of Veterinary Medicine before becoming Founding Chair of the Department of Pathobiological Sciences at the new School of Veterinary Medicine in 1982. He served as Chair for 31 years and retired to Emeritus status in 2016. Throughout his career, Ron emphasized the translational aspects of immunological research, especially the development and assessment of immunodiagnostics and vaccines in domestic animal species. Dr. Shultz has been an enthusiastic supporter of CRWAD for 50 years and served as President in 1994. He led development of the American Association of Veterinary Immunologists and served as its first President in 1979. Ron has received numerous awards including the first Distinguished Veterinary Immunologist Award in 1988, and being named an Honorary Diplomate of the American College of Veterinary Microbiologists. He instilled dedication to CRWAD in his trainees and faculty, many of whom continue to attend and support CRWAD.

CRWAD 2018 Meeting Dedication, Chicago D/E - 5th floor, 12/2/2018 5:00 PM

CRWAD 2018 Featured Speakers:



“Animal health as a Driver to Achieve the Sustainable Development Goals.”

Guy Palmer - CRWAD Council Keynote Speaker

Regents Professor, Jan and Jack Creighton Endowed Chair and Senior Director, Paul G. Allen School for Global Animal Health, Washington State University.

Chicago D/E - 5th floor, 12/2/2018 5:30 PM



“Comparative Immunobiology: from Asthma to Vaccines.”

Laurel Gershwin - 2018 AAVI Distinguished Veterinary Immunologist

Distinguished Professor, University of California, Davis.

Chicago D - 5th floor, 12/3/2018 2:15 PM



“A One Health Approach in Combatting Emerging Infections.”

Ab Osterhaus - 2018 ACVM Distinguished Veterinary Microbiologist

Professor and Founding Director, Research Center for Emerging Infections and Zoonoses, University of Veterinary Medicine Hannover, Germany.

Chicago D - 5th floor, 12/3/2018 8:30 AM



“Counteracting Animal Diseases at the Global Level.”

Alfonso Torres - 2018 AVEPM Calvin Schwabe Award

Professor Emeritus – Cornell University, and former Deputy Administrator for Veterinary Services at the U.S. Department of Agriculture.

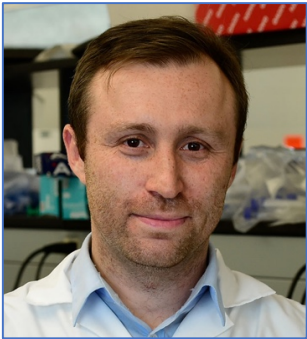
Chicago D - 5th floor, 12/2/2018 1:05 PM



“Mucosal Immune Development in Pig Intestines Related to Gut Microbiota.”

Michael Bailey, Professor of Comparative Immunology, School of Veterinary Sciences, University of Bristol.

Chicago D - 5th floor, 12/3/2018 3:00 PM



“Uterine and Fetal Responses to Zika Virus Infection in the Porcine Model.”

Uladzimir Karniychuk, VIDO-InterVac and the University of Saskatchewan.

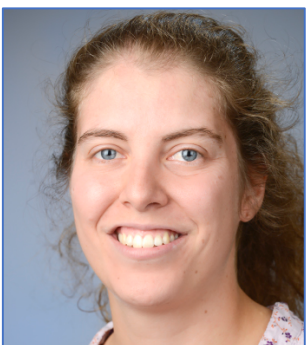
Chicago D - 5th floor, 12/3/2018 5:15 PM



“Gut Health in Food Animals, Especially in Chickens.”

Michael Kogut, Food and Feed Safety Research, United States Department of Agriculture – Agricultural Research Service.

Chicago D - 5th floor, 12/3/2018 4:15 PM



“Big Data and Smart-Connected Epidemiology in Practice.”

Beatriz Martínez-López, Associate Professor, Department of Medicine and Epidemiology, Veterinary School, University of California, Davis.

Chicago D - 5th floor, 12/4/2018 10:30 AM



“Impact of Animal Health at the Community / Household Level in Developing Nations.”

Terry McElwain, Regents Professor Emeritus, Paul G. Allen School for Global Animal Health, Washington State University.

Chicago D - 5th floor, 12/2/2018 1:55 PM



“Beyond Fences: Policy Options for Wildlife, Livelihoods and Transboundary Animal Disease Management in Southern Africa.”

Steve Osofsky, Jay Hyman Professor of Wildlife Health and Health Policy and *AHEAD* Program Coordinator, Cornell University.

Chicago D - 5th floor, 12/2/2018 3:35 PM



“Influenza Surveillance and the Identification of Novel Genetic Mutations that Facilitate Virus Circulation.”

Andrew Pekosz, Department of Molecular Microbiology and Immunology and Department of Environmental Health and Engineering, Johns Hopkins University.

Chicago D - 5th floor, 12/4/2018 10:30 AM



“Bovine Brucellosis and Tuberculosis: International Challenges.”

Valerie Ragan, Director, Center for Public and Corporate Veterinary Medicine, Virginia-Maryland College of Veterinary Medicine.

Chicago D - 5th floor, 12/2/2018 3:00 PM



“Delineating Dendritic Cell Subsets and their Responses to Classical Swine Fever Virus Infection in Lymphoid Tissue.”

Artur Summerfield, Institute of Virology and Immunology, University of Bern.
Chicago D - Floor 5th, 12/3/2018 4:45 PM



“The Social Determinants of Prescribing: Leveraging Social Science to Improve the Use of Antibiotics.”

Julia Szymczak, Perelman School of Medicine and the Center for Clinical Epidemiology and Biostatistics, University of Pennsylvania.
Chicago D - 5th floor, 12/4/2018 8:30 AM



“Transmission and Control of Influenza: The Role of the Piglet.”

Montserrat Torremorell, Department of Veterinary Population Medicine, College of Veterinary Medicine, University of Minnesota.
Chicago E - 5th floor, 12/2/2018 1:15 PM



“Spatio-Temporal Approaches to Surveillance Sampling for Disease Detection.”

Chong Wang, Department of Veterinary Diagnostic and Production Animal Medicine and Department of Statistics, Iowa State University.
Chicago D - 5th floor, 12/4/2018 9:15 AM



“Deciphering Bacterial Pathogenesis: Harnessing the Power of Genomics and Experimental Evolution.”

Qijing Zhang, Professor and Frank Ramsey Endowed Chair in Veterinary Medicine, Iowa State University.
Chicago D - 5th floor, 12/3/2018 9:15 AM

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231 - Big data and smart-connected epidemiology in practice: the value for prevention and control of infectious diseases**B. Martínez-López** University of California, Davis. beamartinezlopez@ucdavis.edu**Session: Session 50, Chicago D (5th), 12/4/2018 10:30 AM**

Livestock industry is daily producing large amounts of multi-scale data (pathogen-, animal-, site-, system-, regional- level) from different sources such as diagnostic laboratories, trade and production records, management and environmental monitoring systems; however, all these data are still presented and used separately and are largely infra-utilized to timely (i.e., near real-time) inform livestock health decisions. Recent advances in the automation of data capture, standardization, multi-scale integration and sharing/communication (i.e. The Internet Of Things) as well as in the development of novel data mining analytical and visualization capabilities specifically adapted to the livestock industry are dramatically changing this paradigm. As a result, we expect vertical advances in the way we prevent and manage livestock diseases both locally and globally. Our team at the Center for Animal Disease Modeling and Surveillance (CADMS), in collaboration with researchers at Iowa State University and industry leaders at Boehringer Ingelheim and GlobalVetLINK have been working in an exceptional research-industry partnership to develop key data connections and novel Big Data capabilities within the Disease BioPortal (<http://bioportal.ucdavis.edu/>). This web-based platform includes automation of diagnostic interpretations and facilitates the combined analysis of health, production and trade data using novel space-time-genomic visualization and data mining tools. Access to confidential databases is individually granted with different levels of secure access, visualization and editing capabilities for participating producers, labs, veterinarians and other stakeholders. Each user can create and share customized dashboards and reports to inform risk-based, more cost-effective, decisions at site, system or regional level. Here we will provide practical examples of applications in the swine, poultry and aquaculture industries. We hope to contribute to the more coordinated and effective prevention and control of infectious diseases locally and globally.

232 - Predictive modeling for detection of dairy cattle at risk of transition diseases as early as dry-off**L.C. Wisnieski¹**, B. Norby¹, S.J. Pierce¹, T. Becker¹, J.C. Gandy², L.M. Sordillo². ¹Michigan State University, ²Dept. of Large Animal Clinical Sciences, College of Veterinary Medicine, Michigan State University. wisnies5@msu.edu**Session: Session 18, Chicago C (5th), 12/3/2018 9:30 AM****Objective**

During the transition from late pregnancy to early lactation, dairy cattle experience tremendous physiological and metabolic changes. Most dairy cows undergo decreased dry matter intake and negative energy balance during early lactation. Although this process is normal in dairy cattle, excessive negative energy balance can lead to metabolic stress, which increases the risk of many diseases (e.g. mastitis, metritis, ketosis). Metabolic stress is described as a physiological state composed of 3 processes: aberrant nutrient metabolism, oxidative stress, and unregulated inflammation. Biomarkers for nutrient metabolism (non-esterified fatty acids, beta-hydroxybutyrate) are frequently used for monitoring metabolic stress in dairy cattle. However, these biomarkers are typically measured around the time of calving, when the risk of developing metabolic stress is greatest and opportunity to intervene has passed. Management changes (e.g. nutritional, environmental) can then only be made retrospectively to aid the next calving cohort. Our objective was to build predictive models for transition diseases measured at dry-off, which allows time to implement preventive measures.

Methods

We designed a prospective cohort study that enrolled clinically healthy cows (n=300) from 5 Michigan herds. We collected serum biomarkers at dry-off and monitored disease until 30 days post-calving. We used best subsets selection to build separate sets of models for each component of metabolic stress and a full model that included all three components. Predictions were then averaged using model weights across each model set.

Results

The area under the curve estimates using receiver operator curves of the averaged predictions for the nutrient metabolism, oxidative stress, inflammation, and the combined model sets were, 0.73 (95% CI: 0.67, 0.79), 0.78 (95% CI: 0.72-0.84), 0.87 (95% CI: 0.83-0.91), and 0.93 (95% CI: 0.90-0.96), respectively.

Conclusions

Our results indicate that it may be possible to predict cattle at risk of transition disease as early as dry-off, which may allow implementation of earlier interventions.