PROCEEDINGS

2010

21ST ANNUAL FLORIDA RUMINANT NUTRITION SYMPOSIUM

February 2 & 3, 2010
Best Western Gateway Grand Hotel
Gainesville, Florida

Department of Animal Sciences
University of Florida
Institute of Food and Agricultural Sciences
Gainesville, Florida 32611

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<u>Tuesday, February 2, 2010</u> - Pre Conference Symposium (Sponsored by Prince Agri Products Inc.)

8:45a.m. Program Introduction - **Dr. Jim Chapman** – Prince Agri Products

9:00a.m. *Periparturient Immunosuppression: What We Know and What We Don't* – **Dr. Matt Waldron** – University of Missouri

10:00a.m. *Maximizing Producer Profits Through Managing Mastitis in Dairy Heifers* - **Dr. Stephen Nickerson** - University of Georgia

11:00a.m. *Modulation of Immune Function in Livestock* – **Dr. Neil Forsberg** – Oregon State University

12:00p.m. Buffet Lunch – Sponsored by Prince Agri Products, Inc.

<u>Tuesday, February 2, 2010</u>

9:00a.m. Registration (until 5:30PM)

12:00p.m Buffet Lunch – Sponsored by Prince Agri Products, Inc.

1:00p.m. Welcome – **Dr. Geoffrey Dahl**, University of Florida

1:10p.m. *Impact of Selection for Residual Feed Intake on Forage Intake by Beef Cows and Feed Efficiency of Progeny* — **Dr. Monty Kerley**, University of Missouri

1:50p.m. *Feeding Behavior, Feed Selection and Risk of Digestive Problems in Dairy Cattle* — **Dr. Trevor DeVries**, University of Guelph

2:30p.m. *Cattle Behavior and Implications to Performance and Health* — **Dr. Jon Huxley**, University of Nottingham

3:10p.m. Refreshment Break - Sponsored by Alltech Biotechnology

3:40p.m. *Feeding Transgenic Feedstuffs to Cattle* — **Dr. Gary Hartnell**, Monsanto Company

4:20p.m. *Feeding Low Starch Diets to Lactating Dairy Cows* — **Dr. Heather Dann**, William H. Miner Agricultural Research Institute

5:00p.m. *Forage Evaluation and Quality in Florida* — **Dr. João Vendramini**, University of Florida

5:45p.m. Welcome Reception

Wednesday, February 3, 2010

6:30a.m. Breakfast

8:00a.m. Nutritional Strategies for Replacement Dairy Heifers — **Dr. Jud Heinrichs**, Pennsylvania State University

8:40a.m. *Efficiency of Cattle Production and its Carbon Footprint* — **Dr. Dale Bauman**, Cornell University

9:20a.m. *Essentiality of Fatty Acids in Ruminant Diets* — **Dr. Don Palmquist**, The Ohio State University

10:00a.m. Refreshment Break

10:30a.m. *Chromium Supplementation in Cattle Diets* — **Dr. Jerry Spears**, North Carolina State University

11:10a.m. *Supplemental Antioxidants to Enhance Fertility in Cattle* — **Dr. Peter Hansen**, University of Florida

11:50a.m. Ruminant Nutrition Symposium Adjourn

Additional copies of these proceedings are available at $15 per copy. Make checks payable to: Florida Ruminant Nutrition Symposium.

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Symposium Speakers

Guest

Dale E. Bauman, Cornell University, Ithaca, NY
Heather M. Dann, William H. Miner Agricultural Research Institute, Chazy, NY
Trevor DeVries, University of Guelph, Kemptville, Canada
Neil Forsberg, Oregon State University, Corvallis, OR
Gary Hartnell, Monsanto Company, St. Louis, MO
Jud Heinrichs, Pennsylvania State University, University Park, PA
Jon Huxley, University of Nottingham, United Kingdom
Monty Kerley, University of Missouri, Columbia, MO
Stephen C. Nickerson, University of Georgia, Athens, GA
Donald L. Palmquist, The Ohio State University, Columbus, OH
Jerry Spears, North Carolina State University, Raleigh, NC
Matthew Waldron, University of Missouri, Columbia, MO

University of Florida
Department of Animal Sciences

Peter J. Hansen, Professor
João Vendramini, UF, Range Cattle Research & Education Center, Ona, FL

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David M. Waagner, Elanco Animal Health, Valdosta, GA

21st Annual Florida Ruminant Nutrition Symposium

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Title and Presenter ***Page***

Dr. Matt Waldron received his BS degree from Cornell University in 1993 and a MS degree from The University of Tennessee in 1996. He then returned to the northeast US where he worked in the feed industry for Agway Agricultural Products for 3 years before returning to Cornell University to pursue his PhD with Dr. Tom Overton, which he completed in 2004. He remained at Cornell as a postdoctoral research associate in the Department of Animal Science through June 2006 when he joined the faculty at the University of Vermont. In June 2008, Matt moved to the University of Missouri where he is now a faculty member in the Division of Animal Sciences. His research involves studying the effects of nutrition and management on development of infectious diseases and metabolic disorders in dairy cattle. He is also interested in how sickness impacts the nutritional requirements and metabolism of the animal.

Dr. Stephen Nickerson received his BS in Animal and Veterinary Sciences with distinction from the University of Maine; the MS and PhD degrees in Dairy Science from Virginia Polytechnic Institute and State University. In 1981 he joined the staff of Louisiana State University's Hill Farm Research Station where he was the Director of the Mastitis Research Laboratory until 2001. He then became the Head of the Department of Dairy Science at Virginia Polytechnic Institute and State University from 2001 to 2003. Currently, Dr. Nickerson is a professor of lactation physiology in the Animal and Dairy Science Department at the University of Georgia. His research has focused primarily on methods to control and prevent mastitis in dairy cattle. He is author or co-author of numerous scientific publications, bulletins, books, book chapters, abstracts, and popular articles. He is the recipient of numerous scientific and service awards; and he was the Editor-in-Chief of Journal of Dairy Science from 2002 to 2004.

Dr. Neil Forsberg received his PhD in Nutrition at the University of California Davis in 1983 then worked for 2 years at Cornell University as a post-doctoral research associate in the Department of Avian and Poultry Sciences. He was hired in 1985 at Oregon State University as a Ruminant Nutritionist and worked there for 23 years, being promoted to Professor in 1996. In 2002 Neil, in collaboration with Dr. Steve Puntenney, founded a new company (OmniGen) which was oriented toward the development of feed additives to improve livestock health. Their first product was licensed in 2003 and is used primarily in the US Dairy industry. Neil travels extensively giving talks both domestically and internationally on nutritional immunology of ruminant animals and conducts research in his company on new products.

Dr. Monty Kerley earned a PhD and MS from the University of Illinois-Urbana and a BS from Southern Illinois University-Carbondale. He is currently a Professor of Animal Sciences at University of Missouri emphasizing beef cattle nutrition. His research has focused on understanding nutritional and biological influences on beef cattle efficiency. Among the different areas of research effort, he studies relationships between mitochondrial respiration and metabolic efficiency of cattle; optimum amino acid to energy ratios that maximize gain efficiency; optimum degradable protein levels that maximize microbial efficiency in the rumen and minimizes nitrogen waste; methods to allow roughage removal from concentrate diets and reduce waste and gas excretion. He is faculty coordinator of University of Missouri Beef Research and Teaching Farm and University of Missouri Feedmill. He teaches courses in ruminant nutrition, and has trained MS and PhD students. His work has resulted in numerous referred articles, book chapters and abstracts, and he has been awarded patents. Dr. Kerley has received several awards from his contributions to teaching and research in beef cattle nutrition.

Dr. Trevor DeVries completed his PhD in Animal Science in 2006 at The University of British Columbia. He was a post-doctoral researcher with Agriculture and Agri-Food Canada for one year before being appointed as an Assistant Professor in the Department of Animal and Poultry Science at the University of Guelph, Kemptville Campus in 2007. Trevor's research focus is on understanding the links between dairy cow behavior, nutrition, health and welfare. Much of his research has been targeted at the improvement of feeding management and feed area design for dairy cows. His current research is focused on understanding diet selection in dairy cattle and ways to manage this to improve production, health, and welfare.

Dr. Jon Huxley was born and raised on a dairy farm in north Wales. He graduated from the Royal Veterinary College, London in 1995 with the Royal Agricultural Society of England first prize for farm animal studies. After 4 years in farm animal practice at Bristol Veterinary School and then in North Wales, he returned to Bristol in 1999 to complete a PhD on bovine mastitis. He remained at Bristol as Lecturer in Farm Animal Production Medicine until 2006 when he became one of the foundation staff at the new School of Veterinary Medicine and Science at the University of Nottingham where he is an Associate Professor. He was awarded the RCVS certificate in Cattle Health and Production in 2000 and the RCVS Diploma in Cattle Health and Production in 2005. In 2006 he became a diplomate of the European College of Bovine Health Management and a Royal College of Veterinary Surgeons Specialist in Cattle Health and Production. His clinical and research interests are in the endemic diseases of dairy cows, particularly lameness and mastitis, and the impacts of housing and the environment on cattle health and welfare.

Dr. Gary Hartnell was born in Wisconsin and raised on a general livestock farm. He received his BS degree in 1973 from the University of Wisconsin - Parkside. In 1975 and 1977, he received his MS and PhD degrees from the University of Wisconsin - Madison, respectively. From 1977 through 1983, he worked for Wayne's Feed Division of Continental Grain Company. From 1983 until present, Hartnell has been employed by Monsanto Company where he has been actively involved in biotechnology. He has successfully orchestrated research worldwide encompassing different areas of livestock nutrition and metabolism. At Monsanto, Hartnell develops strategies based on science for the acceptance of biotech crops and their co-products and conducts poultry, livestock and aquaculture studies in the evaluation of these products for regulatory, industry and consumer acceptance globally. Hartnell is the past president of the American Dairy Science Association and the Federation of Animal Science Societies. He currently serves on the Board of Agriculture and Natural Resources (National Research Council), as the Chair of the FASS Scientific Policy Committee, and on the animal feed committee of the Agricultural Biotechnology Stewardship Technical Committee. He has authored or co-authored many publications.

Dr. Heather Dann received her BS degree from Cornell University, MS degree from the Pennsylvania State University, and PhD degree from the University of Illinois in the area of nutritional physiology of dairy cows during late gestation and early lactation. Currently, Heather is a research scientist at the William H. Miner Agricultural Research Institute located in Chazy, NY. She is also an adjunct assistant professor at the University of Vermont. Her research interests include nutritional physiology of dairy cattle, forage chemistry, and source of carbohydrate in diets for dairy cattle.

Dr. João Vendramini a native of Brazil, received his BS degree in agronomy from the University of São Paulo, the MS degree in Animal Sciences from the same institution, and the PhD in forage management in the Department of Agronomy at the University of Florida in 2005. He was an assistant professor at Texas A & M University before moving to the University of Florida in 2006 where he has research and extension appointments in the Range Cattle Research and Education Center, Ona, FL. Dr. Vendramini's research program is dedicated to forage management with emphasis on sub-tropical production systems. The major area of interest is forage-livestock interface and the impact of forage management on forage and animal production, and environmental quality.

Dr. Jud Heinrichs is a native of New York, where he was raised on a small Holstein farm. Jud has been with Penn State since 1982, initially in an extension appointment and later in an extension/research appointment. His program area is dairy nutrition and management with an emphasis in replacement animals. Jud's interest in the growth and management of dairy heifers has allowed him to work on several population studies of growth rates of dairy heifers as well as revise the Holstein weight tapes currently used worldwide. He is a co-inventor of the Penn State Forage and TMR Particle Size Separator. Jud spent his sabbatical from 1991 to 1992 with the USDA, where he was in charge of the National Dairy Heifer Evaluation Project. A second sabbatical in 2009 was spent at the University of Bologna Italy where he studied effective fiber in dairy cow diets. He has authored numerous publications primarily in the area of dairy replacements and forages.

Dr. Dale Bauman is a Liberty Hyde Bailey Professor in the Department of Animal Science and the Division of Nutritional Sciences at Cornell University. His research on the metabolic regulation of nutrient use has led to the definition of biological concepts and agricultural applications, and he has coauthored more than 700 scientific articles, reviews, and abstracts. Bauman's current research focuses on regulation of milk fat synthesis, production of animal-derived functional foods and environmental impact of dairy production. Born in Michigan he received his undergraduate and graduate degrees at Michigan State University and the University of Illinois. Bauman was elected to the National Academy of Sciences, and has also served as Chairman of the NAS/NRC Board on Agriculture & Natural Resources and President of the American Society for Nutrition.

Dr. Don Palmquist a native of Oregon, received his BS in Dairy Science from Oregon State University, PhD in Nutrition from the University of California, Davis. He conducted post-doctoral studies in metabolism at the University of Illinois, and was a faculty member in the Department of Dairy Science (now Animal Sciences), Ohio Agricultural Research and Development Center/The Ohio State University, Wooster, from 1967 to 2000. His primary research is in feeding of fats, fat metabolism, and milk synthesis in dairy cattle. He developed and patented calcium soaps as energy supplement for high producing cows. Professor Emeritus since 2000, he continues to write and lecture nationally and internationally on fats in feeds, fat metabolism and milk composition, as well as consulting in the feed industry.

Dr. Jerry Spears received his BS and MS degrees in Animal Science from the University of Kentucky, and his PhD degree in Animal Nutrition from the University of Illinois. Dr. Spears was an Assistant Professor of Animal Science at the University of Arkansas from 1979 to 1981. In 1981, he moved to North Carolina State University where he is currently Professor of Animal Science and Nutrition. Dr. Spears is recognized nationally and internationally as a leading authority in the area of mineral nutrition of domestic animals. He has authored or co-authored over 400 publications including 170 refereed journal articles and book chapters. He was awarded the Ruminant Nutrition Award from the American Society of Animal Science in 1995. Earlier (1989) he was presented the Outstanding Young Animal Scientist Award by the Southern Section of the American Society of Animal Science. He has served on the editorial boards of the Journal of Animal Science, Journal of Dairy Science, and the Asian-Australasian Journal of Animal Science. Dr. Spears has also served on the National Research Council-Committee on Animal Nutrition and the National Research Council-Sub-committee on Beef Cattle Nutrition. He recently served on the National Research Council-Committee on Minerals and Toxic Substances in Diets and Water for Animals. This committee was responsible for revising the book Mineral Tolerance of Animals.

Dr. Peter Hansen is a professor of reproductive biology in the Department of Animal Sciences at the University of Florida. He received his graduate education in endocrinology and reproductive physiology from the University of Wisconsin. He conducted post-doctoral studies in biochemistry and molecular biology at the University of Florida and he has been on sabbatical at the Ontario Veterinary College in Canada. The overall goal of his research program is to understand determinants of pregnancy success in ruminants. One major area of research is the elucidation of the cellular and molecular processes by which cellular stress disrupts embryonic function and the intercellular defense systems that embryos use to limit these effects. Of special interest is the understanding of the molecular basis for the thermotolerance that embryos develop as they advance through development. Focus has been on the role of heat shock proteins, antioxidants, and apoptosis in determining resistance of embryos to elevated temperature.