

Nutrient Requirements of Dairy Cattle, 8th edition

Committee

Richard A. Erdman

Chair

Dr. Richard Erdman is Professor of Animal Sciences in the Animal and Avian Sciences Department at the University of Maryland. Dr. Erdman's research focuses primarily on nutrition of the dairy cow with emphasis on energy metabolism and the effects of nutrition on milk components. He was born and raised on a dairy farm near Fort Atkinson, Wisconsin. Dr. Erdman joined the Dairy Science Department at the University of Maryland as an assistant professor in 1979. He served as department chair at Maryland from 1999-2007 where he provided administrative leadership to a department consisting of 22 faculty, 28 staff members, 240 undergraduate students and 40 graduate students. He has taught undergraduate and graduate courses in applied nutrition, energy metabolism, and animal production systems. He has served as major professor to more than 25 graduate students who hold positions in industry and academia. Dr. Erdman has received several awards including the American Feed Industries Award for Dairy Nutrition Research in 1996. He was a member of the NRC committee that prepared the 2001 report on the Nutrient Requirements of Dairy Cattle. Dr. Erdman received his B.S. degree in Animal Science at the University of Wisconsin-River Falls, and an M.S. and Ph.D. in Animal Nutrition at the University of Kentucky.

William P. Weiss

Vice Chair

Dr. William P. Weiss is a Professor and Extension Specialist of Animal Science at The Ohio State University. His main research areas include factors affecting manure and nutrient excretion by dairy cows, energy metabolism in dairy cows, the relationships between minerals and vitamins and health of dairy cows, statistical and chemical evaluation of feedstuffs, and the effects of diet variability on productivity of dairy cows and profitability of dairy farms. Dr. Weiss was given the American Feed Industry Award, the Applied Dairy Nutrition Award and the Pioneer Forage Research Award by the American Dairy Association and has served as a Diplomat of the American College of Animal Nutrition since 2010. Dr. Weiss was a member of the NRC Committee on Animal Nutrition (CAN) from 1997-2001. He also was a member of the NRC committee that prepared the 2001 report on the Nutrient Requirements of Dairy Cattle. Dr. Weiss earned his B.S. and M.S. at Purdue University and his Ph.D. at the Ohio State University.

Michael Allen

Member

Dr. Michael Allen is a University Distinguished Professor of Dairy Cattle Nutrition at Michigan State University. His primary areas of expertise include the digestion kinetics of fiber and starch, the effects of type and temporal supply of metabolic fuels (glucose, lactate, amino acids) on energy intake and partitioning, grouping strategies, metabolic diseases, fiber requirements, evaluation of forage (and feedstuff) quality, and production response to supplemental fat for lactating cows. He has earned many awards, including the American Feed Industry Association Nutrition Award, the Nutrition Professional's Applied Dairy Nutrition Award, and the Pioneer Forage Award from the American Dairy Science Association. Dr. Allen earned his B.S. in Agriculture, M.S. and Ph.D. in Dairy Nutrition from Cornell University, and conducted his post-doctoral work at the USDA-US Dairy Forage Research Center.

Louis Armentano

Member

Dr. Louis Armentano is a Professor of Dairy Science and Nutrition at the University of Wisconsin-Madison. His main interests are in ruminant nutrition and intermediary metabolism as it impacts lactating dairy cows, as well as quantitative techniques of whole animal and system specific nutrient fluxes. Dr. Armentano's past research focused on liver metabolism and the use of by-product feeds in dairy rations. Dr. Armentano's current research is focused on the role of specific dietary fatty acids and their differential effect on milk production, energy balance and milk fatty acid composition. He is also actively involved in describing and measuring feed efficiency in dairy herds, and improving feed efficiency through genetic and genomic selection and also by other management practices. Dr. Armentano received his B.S. in Animal Science from Cornell University, M.S. in Nutrition from North Carolina State University, and Ph.D. in Nutritional Physiology from Iowa State University.

James Drackley

Member

Dr. James Drackley is Professor of Animal Sciences at the University of Illinois at Urbana-Champaign. Dr. Drackley's current research program centers on dry period nutrition and metabolism of transition cows, and aspects of calf nutrition and management. Previous research areas included liver metabolism, dietary fat utilization, and lipid metabolism in ruminants. He grew up on a dairy farm in southwestern Minnesota, and received his B.S. in Dairy Production and his M.S. in Dairy Science from South Dakota State University. Dr. Drackley joined the faculty of the University of Illinois in 1989 after receiving his Ph.D. in Nutritional Physiology from Iowa State University. Dr. Drackley has taught courses in ruminant nutrition, energy nutrition, and lipid metabolism. He has published extensively and has trained 36 graduate students. He has received local and national awards for his research and teaching, including the 2002 American Feed Industry Award for Excellence in Dairy Cattle Nutrition Research and the 2007 Nutrition Professionals, Inc. Applied Dairy Nutrition Award from the American Dairy Science Association (ADSA). Dr. Drackley has long been active in ADSA, including service on the Board of Directors, President of the Midwest Branch, and Chair of the Production Division.

Jeff Firkins

Member

Dr. Jeffrey Firkins is a Professor in the Department of Animal Sciences of The Ohio State University. His areas of expertise include bioactive properties of milk and quantitative analyses of kinetic models. Dr. Firkins' research studies interface between nutrition and microbiology to enhance the conversion of dietary protein into microbial protein and reduce enteric methane production; the interactions of physical, chemical, and microbiological processes related to fiber and starch degradation, passage, and biohydrogenation in dairy cattle; and the quantitative prediction of protein and carbohydrate digestion and microbial protein production in dairy cattle. Dr. Firkins is a member of the American Dairy Science Association (ADSA) and he was awarded the ADSA Nutrition Professionals Applied Dairy Nutrition Award in 2003 and the ADSA American Feed Industry Association Dairy Nutrition Research Award in 2012. Dr. Firkins received his B.S. in Animal Science, M.S. and Ph.D. in Ruminant Nutrition from the University of Illinois.

Mary Beth Hall

Member

Dr. Mary Beth Hall is a Research Animal Scientist at the U.S. Dairy Forage Research Center with the USDA Agricultural Research Service. Her current research includes evaluating and developing methods for analyzing nutritionally relevant carbohydrates in feeds, determining the differences in and factors affecting ruminal fermentation products among nonfiber carbohydrates, and identifying the direct and interaction effects of protein degradability and nonfiber carbohydrate type on dairy cattle lactation performance. Dr. Hall also has experience in the use and structure of models, various in vitro fermentation techniques for feed evaluation, practical dairy cattle nutrition, and application of ruminant nutrition principles to captive herbivores. Before joining USDA, she was an Associate Professor at the University of Florida, working in dairy nutrition extension and research. Dr. Hall earned her B.S. in Animal Science from Cornell University, M.S. in Animal Science from Virginia Polytechnic Institute and State University, and Ph.D. in Animal Science from Cornell University.

Mark Hanigan

Member

Dr. Mark Hanigan is the David R. and Margaret Lincicome Professor of Dairy Science in the College of Agriculture and Life Sciences at Virginia Polytechnic Institute and State University. His areas of expertise include animal nutrition, nutrient metabolism, and metabolic modeling. Dr. Hanigan's research interests include experimental and modeling work focused on amino acid and protein metabolism, volatile fatty acid metabolism, phosphorus digestion, lipid deposition in dairy and beef cattle, the regulation of energy and nitrogen metabolism in the ruminant, and the resulting impact on the environment. He is a member of the American Dairy Science Association and the American Society for Nutrition. Dr. Hanigan received his B.S. in Dairy Science from Iowa State University, M.S. in Animal Science, Ph.D. in Nutrition from the University of California-Davis, and he conducted his postdoctoral work in the Department of Biochemistry and Biophysics at the University of California-Davis.

Ermias Kebreab

Member

Dr. Ermias Kebreab is a Professor of Animal Science, Sesnon Endowed Chair of Sustainable Animal Agriculture in the Department of Animal Science at the University of California-Davis, and Deputy Director of the Agricultural Sustainability Institute. He conducts research on reducing the impact of animal agriculture, particularly dairy cattle, on the environment by reducing greenhouse gas emissions and nutrient loading. Dr. Kebreab uses a range of mathematical modeling techniques and experimentation to address environmental and nutrition related issues. Some of the awards received in recognition of Dr. Kebreab's work include the 2006 Young Scientist Award from the Canadian Society of Animal Science, the 2008 Early Career Achievement Award and the 2014 Ruminant Nutrition Award from the American Society of Animal Science. Dr. Kebreab received his B.S. in Biology from the University of Asmara (Eritrea), and an M.S. in Integrative Biology and Ph.D. in Ecological Modeling from the University of Reading (UK).

Paul Kononoff

Member

Dr. Paul Kononoff is a Professor of Dairy Nutrition in the department of Animal Science at the University of Nebraska-Lincoln. His research focuses on feed characterization and the relationships between fiber quality and ruminal fermentation in lactating dairy cattle. He has studied how manipulations of forage particle size and cell wall lignification affects feed efficiency, milk production, milk composition, and rumen fermentation. His research has also examined ration formulation methods that seek to maximize the inclusion of corn milling co-products while sustaining normal milk production and composition. As a dairy nutritionist, Dr. Kononoff has assisted the dairy industry as a Technical Support Specialist for Renaissance Nutrition (Roaring Spring, Pennsylvania) and as a Project Director of the Ruminant Feed Analysis Consortium (Durham, NH). Dr. Kononoff is a member of the American Dairy Science Association and the Nebraska State Dairy Association. He served as an editor for the Journal of Dairy Science and the Canadian Journal of Animal Science. He received his B.S. and M.S. in Animal Science from the University of Saskatchewan and Ph.D. in Animal Science from Pennsylvania State University.

Helene Lapierre

Member

Dr. Hélène Lapierre is a Research Scientist of Animal Metabolism in the Dairy and Swine Research and Development Centre at Agriculture and Agri-Food Canada and an Adjunct Professor in the Department of Animal Science at Université Laval. Her areas of expertise include the efficiency of nutrient use in the production of milk and milk components, factors affecting release or utilization of nutrients by the gut, the liver and the mammary gland, and improvement of the transfer of protein from dairy rations into milk protein in order to lower milk production costs and reducing nitrogenous excreta in the environment. Dr. Lapierre is a member of the Canadian Society of Animal Science and the American Dairy Science Association. She was the recipient of the CSAS Award in Excellence in Nutrition and Meat Science in 2014 from the Canadian Society of Animal Science. Dr. Lapierre earned her B.S. and M.S. in Agriculture from the Université Laval, and Ph.D. in Biology from the University of Sherbrooke. She conducted post-doctoral work at the USDA Agricultural Research Service.

Michael VandeHaar

Member

Dr. Michael VandeHaar is a Professor of Dairy Nutrition and Physiology in the Department of Animal Science at Michigan State University. His research involves dairy cattle nutrition and physiology with the intent of improving heifer growth and mammary development and increasing the efficiency of protein production in the dairy industry. For the past 4 years, Dr. VandeHaar has been project director of a large USDA-funded project, "Genomic Selection and Herd Management for Improved Feed Efficiency of the Dairy Industry." A major part of the project is to develop a database of feed intake and milk output on 8000 cows with genotypes. This database will be used to develop genomic breeding values for feed efficiency and to develop and test nutritional models. Dr. VandeHaar is a member of the National Animal Nutrition Program NRSP-9 modeling subcommittee. In 2013, he was awarded the highest honor for dairy scientists in nutrition, the American Feed Industry Association Award. Dr. VandeHaar earned his B.A. degree from Dordt College, Iowa, and M.S. and Ph.D. from Iowa State University. He conducted his post-doctoral work at the University of North Carolina.