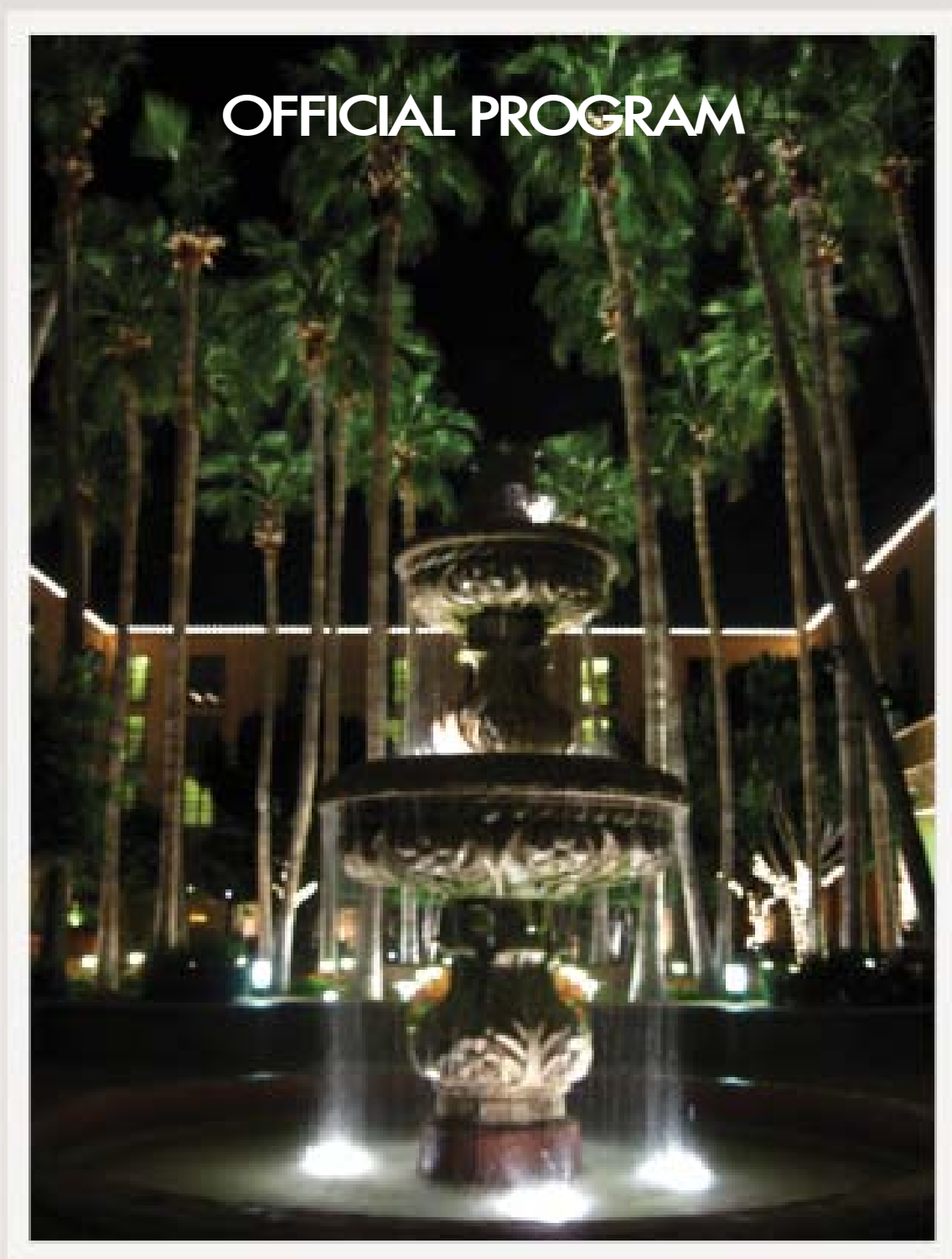


# 27<sup>TH</sup> SOUTHWEST NUTRITION & MANAGEMENT CONFERENCE

FEB. 23-24, 2012



*Produced Courtesy of Western DairyBusiness*

# 2012 SOUTHWEST NUTRITION & MANAGEMENT CONFERENCE SCHEDULE

## WEDNESDAY, FEB. 22<sup>ND</sup>

8:30 a.m. Annual Golf Tournament, Karsten Golf Course  
5:00 - 7:00 p.m. Registration Opens & Opening Reception

### Pre-Conference Symposium, Zinpro Performance Minerals

## THURSDAY, FEB. 23<sup>RD</sup>

7:30 a.m. Registration Desk Open  
8:00 a.m. Introduction Pre-Conference Symposium  
Zinpro Performance Minerals  
8:15 a.m. The Activation of the Immune System:  
It Doesn't Get a Free Ride  
*Christopher Chase, South Dakota State University*  
9:15 a.m. Fine Tuning Production Efficiency Using Trace Minerals  
*Jeffrey DeFrain, Zinpro Corporation*  
10:15 a.m. Break  
10:30 a.m. Searching for a more Efficient Cow  
*Mike VandeHaar, Michigan State University*  
11:30 a.m. Lunch On Your Own

### Southwest Nutrition & Management Conference

1:00 p.m. Introduction  
*Ron Allen, University of Arizona*  
1:15 p.m. Oxidative Stress, Trace Minerals & Mastitis  
in Dairy Cows  
*Lorraine Sordillo, Michigan State University*  
2:00 p.m. Impact of Carbohydrate Source on  
Rumen Microbial Ecosystem  
*Jeffrey Firkins, The Ohio State University*  
2:45 p.m. Metabolic Implications of Heat Stress  
*Robert Collier, University of Arizona*  
3:30 p.m. Break  
3:45 p.m. New Developments in Cow Cooling  
*John Smith, University of Arizona*  
4:30 p.m. Western DairyBusiness Awards  
2012 Outstanding Dairy Producer of the Year  
2012 Outstanding Educator/Researcher of the Year  
*Ron Goble, Associate Publisher/Editor*  
5:00 p.m. Wine & Cheese Reception  
Zinpro Performance Minerals

## FRIDAY, FEB. 24<sup>TH</sup>

8:00 a.m. Evidence for Similar Changes in Offspring  
Phenotype Following Either Maternal  
Undernutrition or Overnutrition  
*Nathan Long, University of Arizona*  
8:45 a.m. Impact of Animal Health & Immune Function on  
Beef Animal Growth  
*Clinton Kriehbiel, South Dakota State University*  
9:30 a.m. Break  
9:45 a.m. Balancing Carbohydrate Sources for Dairy Cows  
During a Period of High Corn Prices  
*Randy Shaver, University of Wisconsin-Madison*  
10:30 a.m. Stress Mediated Regulation of Feed Intake  
*Benejamin Renquist, University of Arizona*  
11:15 a.m. Calf Production Management Strategies to Improve  
Rumen Development  
*Jamison Allen, University of Arizona*  
12:00 p.m. Conference Concludes

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**REGISTRATION**  
27th Annual Southwest Nutrition & Management Conference  
February 23-24, 2012  
Tempe Mission Palms Hotel | Tempe, Arizona

Name/Organization \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Phone \_\_\_\_\_ Fax \_\_\_\_\_  
Email \_\_\_\_\_

Early Registration - \$150 per person (Deadline - Feb. 1, 2012)  
Late Registration - \$185 per person (After Feb. 1, 2012)  
Complimentary Proceeding Options \_\_\_\_\_  
Additional Proceedings Options (\$25 per additional proceeding) \_\_\_\_\_  
Total Amount - Additional Proceedings \_\_\_\_\_  
Total Amount Enclosed or Charged to Credit Card \_\_\_\_\_  
Name on Credit Card \_\_\_\_\_  
Type of Credit Card \_\_\_\_\_  
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Signature \_\_\_\_\_

**SOUTHWEST NUTRITION & MANAGEMENT CONFERENCE** celebrates its 27th year with its gathering of dairy producers and representatives from related business and industries. The Conference will be held at Tempe Mission Palms Hotel. Details are included in this official SWNMC program.

# TOPICS & SPEAKERS

### THE ACTIVATION OF THE IMMUNE SYSTEM – IT DOESN'T GET A FREE RIDE

*Christopher Chase, Ph.D., South Dakota State University*

**In a nutshell:** This talk will provide an understanding of the innate and acquired immune response directed to vaccination. This talk will also provide an overview on the effect of physiological process in the cow and their implications for vaccination

**Chase career highlights:** Dr. Chris Chase, Professor, Department of Veterinary Science, South Dakota State University (SDSU) is a native of Sisseton, SD and attended SDSU. He received his DVM from Iowa State University (1980) and M.S. (1987) and Ph.D. (1990) from the University of Wisconsin-Madison. He was an associate at the Viborg Veterinary Clinic, Viborg, SD, for 5 years and continued his involvement in clinical veterinary medicine for 25 years.

Chase's research has been directed at understanding the initial events of viral infections to develop better methods for preventing virus infections in animals. He also has applied the tools of molecular biology to developing better methods of detecting disease producing organisms. He also has an interest in the emerging diseases of wildlife origin. His clinical experience is with dairy, cow-calf, feedlot, and hog herd health. He is the past president of the South Dakota Veterinary Medical Association. He is the past president of the American Association of Veterinary Immunologists.



CHASE

### FINE TUNING PRODUCTION EFFICIENCY USING TRACE MINERALS

*Jeffrey DeFrain, Ph.D., Research Nutritionist, Zinpro Corporation*

**In a nutshell:** Gains in production efficiency can be realized from a collection of marginal improvements across multiple components of biological systems. In particular, compromises in immune function, reproductive performance and foot health result in less than optimal production efficiency. The objective of this presentation will be to review the significant role of trace minerals in enhancing animal health, optimizing performance and driving production efficiency.

**DeFrain career highlights:** Dr. DeFrain earned his B.S. and M.S. degrees in animal science from Kansas State University and his Ph.D. in animal science from South Dakota State University. His M.S. thesis focused on the development and evaluation of a pelleted feedstuff containing raw soybean hulls and corn steep liquor for lactating dairy cattle diets. During his doctoral research, he conducted a series of experiments to evaluate the effects of diets formulated to increase the supply of ketones or ketone precursors on the carbohydrate status of transition dairy cows. Prior to joining Zinpro, Dr. DeFrain was serving as an on-farm nutritionist for a multi-site dairy operation in the Midwest. His duties at Zinpro include overseeing dairy research projects and providing technical services and support.



DEFRAIN

### SEARCHING FOR A MORE EFFICIENT COW

*Mike VandeHaar, Ph.D., Michigan State University*

**In a nutshell:** The efficiency with which dairy cattle convert feed to milk has increased markedly over the past 100 years as the indirect result of a focus on increasing productivity through genetic selection and management. Increased milk production per cow decreases the proportion of the feed needed for body maintenance. Elite cows currently eat at >4 times maintenance, and with high intake digestibility decreases, so future increases in feed efficiency may well require shifting our focus directly toward milk per feed instead of milk per cow. Recent funding from the USDA National Institute of Food and Agriculture will enable a team of scientists from Michigan, Wisconsin, Iowa, Florida, Virginia, North Carolina, and the Netherlands to search for a more efficient cow. In this presentation, we will define feed efficiency and methods for measuring it, present our current knowledge on the genetics of feed efficiency and opportunities to improve it, and outline our plans to find a more efficient cow and improve farm feed efficiency.

We will develop a feed efficiency database of 8,000 Holstein cows with phenotype and genotype data. With this data, we will determine the genetic architecture of feed efficiency in lactating dairy cows and facilitate implementation of genomic selection programs that will improve feed efficiency without impairing health or fertility. We also will develop and deploy practical state-of-the-art decision support tools to improve feed efficiency at the farm level. *Coauthors of this paper include Louis Armentano, Professor of Dairy Nutrition at the University of Wisconsin and Diane Spurlock, Assoc Professor of Genetics at Iowa State University.*

**VandeHaar career highlights:** Michael VandeHaar is a professor in dairy nutrition at Michigan State University. He grew up on a farm in Iowa and received his Ph.D. at Iowa State. His research program has focused on understanding mechanisms by which nutrition impacts development and function of the mammary gland. He also has published on energetics and feed efficiency and is project director for a recently funded multi-state project to develop genomic and management tools for enhancing feed efficiency of the dairy industry. He also teaches comparative nutrition to undergraduates and was the primary developer of the Spartan Dairy Ration Balancer 2 and 3 programs. Mike lives on a "hobby farm" near Eaton Rapids, Mich., with his wife, Cheryl, and they have three sons.



VANDEHAAR

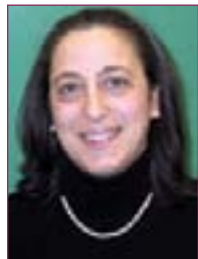
### OXIDATIVE STRESS, TRACE MINERAL, AND MASTITIS IN DAIRY COWS

*Lorraine Sordillo, Ph.D., Michigan State University*

**In a nutshell:** Dairy cattle are susceptible to increased incidence and severity of disease during the periparturient period. A major contributing factor to increased health disorders is thought to be alterations in bovine immune mechanisms. Indeed, uncontrolled or impaired inflammatory

responses are a major contributing factor to several economically important disorders such as mastitis. Dairy cows undergo several physiological changes during the onset of lactation that can impact the magnitude and duration of mammary gland inflammatory responses. Oxidative stress, for example, occurs when there is an imbalance between the production of oxygen radicals during times of high metabolic demand and the reduced capabilities of the host's antioxidant defenses. The progressive development of oxidative stress in transition dairy cattle is thought to be a significant underlying factor leading to dysfunctional inflammatory responses both systemically and in mammary gland tissues. Understanding more about the underlying causes of oxidative stress during the periparturient period may facilitate the design of nutritional regimes that will reduce the severity and duration of mastitis as a function of dysfunctional inflammatory responses.

**Sordillo career highlights:** Dr. Lorraine Sordillo earned her Ph.D. in immunology from Louisiana State University, Baton Rouge in 1987. She is currently a faculty member at Michigan State University where she is the first person to hold the Meadow Brook Chair position in Farm Animal Health and Well Being in the Department of Large Animal Clinical Sciences. Lorraine's primary research has focused on developing solutions to control mastitis in dairy cattle by understanding basic mammary gland physiology and immunology. She has garnered more than \$8 million in funds to help support her program from industry and various state programs including the USDA and National Institutes of Health. Her research has resulted in five U.S. patents aimed at mastitis therapy and more than 100 peer-reviewed journal articles.



SORDILLO

## IMPACT OF CARBOHYDRATE SOURCE ON RUMEN MICROBIAL POPULATION

Jeffrey Firkins, Ph.D., The Ohio State University

**In a nutshell:** "When we feed the cow, we feed the rumen." This adage means different things to different people. It could mean that we need to apply appropriate ration balancing, feedbunk management, and cow monitoring to prevent rumen acidity problems, reduce the likelihood of milk fat depression, improve feed efficiency, and/or reduce environmental impact. To me, it means we are feeding different nutrients as substrates to trillions of microorganisms comprised of thousands of different species of four different domains of life, and all of them are competing in positive or negative webs that make up the ruminal ecosystem. As our models continue to improve our flexibility and success with different rations, there are still many different conditions that cannot yet be modeled. Therefore, my paper will explain what we know and what we don't (yet) know about the rumen microbial ecosystem to aid nutrition advisors, veterinarians, and farmers to understand those diverse dietary conditions. My goal is to help you ask better questions when simulating new dietary combinations, troubleshooting different rations that look good on paper, or to explain why ration approaches vary among farms. My goal is to help you know how to "feed the rumen to better feed the cow," under current and future ration trends to feed more fiber, use more unsaturated fat without causing milk fat depression, and to reduce the environmental footprint of dairy farms.

**Firkins career highlights:** Jeffrey Firkins earned a Ph.D. in Ruminant Nutrition at the University of Illinois at Urbana-Champaign in 1987. Following an 8-month postdoctoral fellowship at UIUC in dairy nutrition, he started his tenure at The Ohio State University. He teaches nutrition courses at the undergraduate and graduate

levels and holds a 70% research appointment. His research activities are mainly prioritized in three different areas: 1) improving the efficiency of microbial protein synthesis to enhance the conversion of dietary protein into milk protein and reduce the rumen methane production per unit of microbial protein produced; 2) studying the interactions of physical, chemical, and microbiological processes related to fiber degradation and passage in the rumen to improve the efficiency of fiber and starch utilization in dairy cattle; and 3) improving the quantitative prediction of protein and carbohydrate digestion and metabolism in dairy cattle.



FIRKINS

He has mentored numerous graduate students and is the director of OSU's interdepartmental nutrition program. He has served three terms as a journal editor, served on four USDA competitive grants panels (two as panel manager), and serves on planning committees for two recurring international conferences in rumen microbiology and ruminant physiology. Dr. Firkins has been the P.I. on about \$2 million of research grants, has published more than 250 articles, including more than 90 refereed journal articles and book chapters. He was awarded the ADSA Nutrition Professionals Applied Dairy Nutrition award in 2003. Jeff enjoys sports, history, gardening, camping, and family activities in his spare time.

## METABOLIC IMPLICATIONS OF HEAT STRESS

Robert Collier, Ph.D., University of Arizona

**In a nutshell:** In this presentation we will discuss the THI threshold for heat stress in high producing dairy cows (>70 lbs of milk per day) and also examine the use of geothermal cooling (groundwater) of freestall beds as a new approach to reduce heat stress in cattle. This cooling method has the potential to reduce water and energy consumption on dairies during hot summer months. Heat stress imposes major changes in metabolism of lactating dairy cows. These changes include alteration in feed intake, nutrient partitioning, cardiac output, lipid mobilization, carbohydrate consumption and water turnover. This paper will document these changes and discuss current strategies to improve diets for lactating dairy cows during periods of thermal stress.

**Collier career highlights:** Dr. Collier received his B.S. in zoology from Eastern Illinois University (EIU) in 1969. After service in the Army Medical Corps he earned his M.S. in zoology from EIU in 1973 and his Ph.D. in Dairy Science from the University of Illinois in 1976. His dissertation research was on the endocrine regulation of lactogenesis in the dairy cow. Collier accepted an NIH post-doctorate at the Dairy Science Department of Michigan State University in the laboratory of Dr. Allen Tucker. His research was on the regulation of cortisol uptake in mammary tissue of cattle. Dr. Collier joined the Dairy Science Department at the University of Florida as an assistant professor where he developed a teaching and research program on the environmental physiology of the dairy cow in the subtropics later that year. He also continued his research on the endocrine regulation of lactation in cattle as well as swine. He was promoted to Associate Professor in 1981.

In 1985, Collier joined Monsanto Company as a Science Fellow and initiated a discovery program in lactation and growth regulation. He was promoted to Dairy Research Director and Fellow in 1987 and from 1989



COLLIER

until 1999 was Dairy Research Director and Senior Fellow. In this capacity, Dr. Collier was responsible for all pre-clinical and clinical research in North America required for the commercialization of Bovine Somatotropin as well as research on novel factors regulating growth, development and lactation of domestic animals. From 1987-1999, Dr. Collier was an Adjunct Professor of the Animal Science Department at the University of Missouri.

In 1999, Collier joined the Animal Sciences Department, University of Arizona as Professor of Environmental Physiology. From 2001 to 2005 he was head of the Animal Sciences Department. He is presently Professor Environmental Physiology and Director of the Agricultural Research Complex in the Animal Sciences Department.

In 1990, Dr. Collier was appointed an Honorary Fellow of the Hannah Research Institute, Ayr, Scotland. In 1991, he received the ADSA Upjohn Physiology Award and in 1992 he was selected as Alpha Omega Alpha visiting professor at the University of Indiana. In 2006, he received the University of Illinois, College of Agriculture Alumni Recognition Award. In 2007 he was inaugural Thatcher Lecturer at the University of Florida and in 2008 was awarded the Land O Lakes Award from the American Dairy Science Association for his contributions to the field of Dairy Research. He has also served on both the Nutritional Sciences Advisory Committee and the Animal Sciences Advisory Board for the University of Illinois and the College of Life Sciences at Eastern Illinois University. Collier is author or coauthor of 190 journal articles, chapters and reviews, 156 abstracts, 52 popular articles and 8 U.S. Patents. His areas of expertise include environmental and lactation physiology, endocrinology and molecular biology.

## NEW DEVELOPMENT IN COW COOLING

John Smith, Ph.D., University of Arizona

**In a nutshell:** The ability of dairy cattle to maintain a high level of milk production is dependent on environmental and management factors. Heat stress occurs when ambient conditions prevent adequate regulation of body temperature through transference of heat from the animal to its surrounding environment. The effects of heat stress on milk yield are both indirect through a decrease in feed intake as well as direct through reduction in rate of milk synthesis, leading to a loss in milk production. Hot ambient conditions also have a negative impact on reproductive performance. Consequently, heat stress has a profound negative impact on the profitability of dairy operations. There are number of methods and strategies that can be implemented to reduce the impact of heat stress on the dairy cow. Implementation of complete heat stress program can have a dramatic impact on a dairy's profitability.

**Smith career highlights:** Currently Dr. John F. Smith serves as Dairy Extension Specialist/Professor at The University of Arizona. Dr.

Smith completed a B.S. in 1984 and a M.S. in 1986 at Northwest Missouri State University in Animal Science. In 1990 he completed a Ph.D. at the University of Missouri in Dairy Science. Dr. Smith also served as the Extension Dairy Specialist at New Mexico State University from 1989-1995 and as Extension Specialist, Dairy Science in at Kansas State University from 1995-2011. Dr. Smith's responsibilities at K-State included management of the Dairy, Dairy Commodity Group Leader and Program Leader

for Extension in the Department of Animal Sciences and Industries.

In 2000, he received the Midwest Outstanding Young Extension



SMITH

Specialist Award; 2002, the DeLaval Dairy Extension Award; 2008, he received *Western DairyBusiness* magazines's Outstanding Dairy Industry Educator/Researcher award; and 2010, he received the Bell Tower of Fame Award for his efforts in dairy education and research. Dr. Smith's interests include cow comfort, heat stress, milking parlor performance, special needs facilities, and management of expanding dairies. Smith is one of the co-founders of the Western Dairy Management Conference and High Plains Dairy Management Conference. He works throughout the United States and internationally helping producers to develop efficient dairy operations.

## EVIDENCE FOR SIMILAR CHANGES IN OFFSPRING PHENOTYPE FOLLOWING EITHER MATERNAL UNDERNUTRITION OR OVERNUTRITION

Nathan Long, Ph.D., University of Arizona

**In a nutshell:** The goal of this review is to shed light on the role of maternal malnutrition in inducing epigenetic changes in gene expression, leading to alterations in fetal growth and development, and to altered postnatal phenotype and the development of metabolic disease. Evidence is presented supporting the concept that both maternal undernutrition and overnutrition can induce the same cadre of fetal organ and tissue abnormalities and lead to the same postnatal metabolic changes in the resulting offspring. Further, evidence is presented that in both overnourished and undernourished ovine pregnancies, fetuses experience a period of nutrient restriction as a result of alterations in placental delivery of maternal nutrients into the fetal compartment. It is further argued that this bout of reduced fetal nutrition in undernourished and overnourished pregnancies leads to the development of a thrifty phenotype, in which the fetus attempts to alter the function of its tissues and organs in an attempt to maximize its survival in a postnatal environment deficient in nutrients. Importantly, evidence is presented to support the concept that these phenotypic changes in offspring quality resulting from maternal malnutrition are transmitted to subsequent generations, independent of subsequent maternal nutritional inputs.

**Long career highlights:** Dr. Nathan Long was born and raised in Sandy Springs South Carolina, a small community in Western SC, on a registered cow calf operation. He received his B.S. in Animal and Veterinary Sciences from Clemson University, his M.S. in Animal Science with an emphasis on ruminant nutrition from the University of Georgia and his Ph.D. in Animal Breeding and Reproduction from Oklahoma State University. He comes to the U of A from a Post-doctoral Research Associate position in the Center for the Study of Fetal Programming at the University of Wyoming in Laramie.

In his position at the University of Arizona Dr. Long will be researching the effects of maternal nutrition during gestation on fetal growth and development and how these changes in fetal development affect the postnatal offspring. He will also have the opportunity to perform research on feedlot nutrition and growth and development, postpartum reproductive physiology and general cattle management research. Once Dr. Long's research lab has been launched he will begin teaching several classes including classes in beef cattle management and nutrition.

About coming to the University of Arizona Dr. Long says, "I look forward to working with the quality faculty in the Animal Science department and other departments across the College of Agriculture and the rest of the University."



LONG

## IMPACT OF ANIMAL HEALTH AND IMMUNE FUNCTION ON BEEF ANIMAL GROWTH

Clinton Krehbiel, Ph.D., Oklahoma State University

**In a nutshell:** Inflammation caused by bovine respiratory disease (BRD) continues to be one of the greatest challenges facing beef cattle producers and feedlot managers. Inflammation decreases DMI, ADG, and G:F in feedlot calves decreasing growth rate and increasing days on feed, which results in economic losses during the feeding period. In addition to economic losses related to health cost, decreased performance, carcass weight and death loss, inflammation has the potential to affect carcass cutability and quality. The effects of inflammation on feedlot cattle in regards to performance are well understood; however, specific effects on cattle growth and ultimately carcass merit are not as well described. Research in other species has demonstrated that during the acute phase response, pro-inflammatory cytokines promote skeletal muscle catabolism to supply amino acids and energy substrates for immune tissues. Further, during this early immune response, the liver changes its metabolic priorities to the production of acute phase proteins for use in host defense. Together these dramatic shifts in systemic metabolism may explain the detrimental effects on performance and carcass traits commonly associated with BRD in feedlot calves. Moreover, recent studies relative to human health have revealed complex multilevel interactions between the metabolic and immune systems and highlighted inflammation as being a significant contributor to major metabolic diseases. The purpose of this presentation is to review data to help explain the economical and physiological effects of inflammation on cattle growth and carcass merit.

**Krehbiel career highlights:** Clinton R. Krehbiel is Professor and Dennis and Marta White Endowed Chair in Ruminant Nutrition and



KREHBIEL

Health at Oklahoma State University. Dr. Krehbiel holds an A.A.S. degree from Hutchison Community College (1986), B.S. (1988) and M.S. (1990) degrees from Kansas State University, and a Ph.D. degree (1994) from the University of Nebraska. Dr. Krehbiel was a postdoctoral fellow at the Roman L. Hruska U. S. Meat Animal Research Center, Clay Center, NE. He spent 3.5 years on the faculty at New Mexico State University before joining the faculty in the Department of Animal Science at Oklahoma State University in January 2000. Dr. Krehbiel holds a split appointment between teaching (~20%) and research (~80%). His research interests include understanding relationships involving ruminal fermentation, gastrointestinal tract metabolism, and net nutrient flux to improve animal health, growth, feed efficiency and end-product quality of beef cattle. Dr. Krehbiel has authored or co-authored over 400 refereed journal articles, book chapters, abstracts of papers presented at scientific meetings, research reports of the Agricultural Experiment Stations, and papers published in conference proceedings. He teaches graduate courses in Rumenology, Laboratory Techniques in Animal Nutrition, and co-teaches a Protein Nutrition course. Clint and his wife Shelly have three daughters, Madison, Megan, and Emma.

## BALANCING CARBOHYDRATE SOURCES FOR DAIRY COWS DURING A PERIOD OF HIGH CORN PRICES

Randy Shaver, University of Wisconsin-Madison

**In a nutshell:** Increased corn price has created much interest in the potential for feeding reduced-starch diets to lactating dairy cows.

Reduced-starch diets can be formulated by partially-replacing corn grain with high-fiber byproducts and (or) sugar supplements, and feeding diets with a greater proportion of forage is another option. These alterations to dietary NDF from forage, total NDF, starch and sugar concentrations can impact dry matter intake, milk yield and composition and feed efficiency, and dietary carbohydrate effects on these lactation performance parameters will be reviewed and discussed in this presentation. Related factors, including forage quality, starch digestibility and use of selected feed additives, will also be addressed.

**Shaver career highlights:** Professor Randy Shaver was born and raised on a western Pennsylvania dairy farm. After completing a B.S. degree in Dairy Science at the Pennsylvania State University, Randy received an M.S. degree from the Department of Animal Sciences at the University of Maryland. He then completed his doctorate degree in Dairy Science at the University of Wisconsin-Madison in 1986 after conducting research at UW-Madison and U.S. Dairy Forage Research Center. Randy spent 1986-88 working in industry. Since then he has been on the faculty in the Department of Dairy Science, University of Wisconsin-Madison with a 75% Extension and 25% Research appointment. His extension and research programs focus on applied nutrition of lactating dairy cattle. Randy has authored or co-authored over 69 peer-review journal publications, 110 scientific abstracts, 92 popular-press articles in industry trade magazines, and 225 newsletter articles, extension handouts or bulletins, and internet publications. He has presented over 450 invited papers at industry conferences in 45 states. Additionally, he has been an invited speaker for dairy producer and feed industry audiences in Argentina, Brazil, Chile, Columbia, Czech Republic, Denmark, Germany, Italy, Japan, Korea, Mexico, and nine provinces in Canada. Awards that Randy has received include: ADSA Pioneer Hi-Bred Forage Award, ADSA DeLaval Dairy Extension Award, ADSA Nutrition Professionals Applied Dairy Nutrition Award, and UW-Madison CALS Pound Extension Excellence Award.

## STRESS MEDIATED REGULATION OF FEED INTAKE

Benjamin Renquist, Ph.D., University of Arizona

**In a nutshell:** Nutrition is limiting to production performance in many agricultural systems. Thus understanding what controls feed intake is integral to improving production. Stressors can increase or decrease feed intake and thus research comparing the effects of individual stressors may provide insight into the mechanistic regulation of consumption. Dependent on the nutritional conditions, production demands, and environment an animal may experience nutrition-, lactation-, or heat-stress. During nutritional stress, when feed is inadequate to meet demands the metabolic and hormonal machinery is geared up to increased feed consumption. During lactation, feed intake is also increased. However, when the dietary energy is not sufficient to meet the extremely high energy demands of lactating dairy cows ketosis, and a subsequent drop in feed intake, can ensue. Thus lactation stress can mediate either an increase or decrease in feed intake. Finally, during heat stress feed intake decreases. Studies in the rodent suggest that changes in hepatic metabolite concentrations signal through afferent nerves to affect CNS control of feed intake. We'll examine the known metabolic changes in the cow during each of these stressors and their possible role in the feed intake changes associated with each stress. With an understanding of the metabolic profile and its regulation of feed intake, dietary and pharmacological interventions can be tested and developed.



SHAVER

**Renquist career highlights:** Dr. Renquist was born and raised in Julesburg, Colo., where his family operated a farm and feedlot. Working



RENQUIST

on the family farm and showing animals through 4-H piqued Ben's interest in production animal agriculture. After completing a B.S. in Animal Science from Colorado State University in 2000, Renquist attended the University of California, Davis to pursue a M.S. in Animal Science. During his M.S. thesis research he worked directly with Drs. James Oltjen and Roberto Sainz to study the effect of stocking rate and supplementation strategy on range beef cow performance (2002). Interested in understanding the basic mechanisms by which nutrition could affect reproduction, Ben began research directly examining estradiol negative feedback during nutritional stress. Working with Drs. Christopher Calvert and Thomas Adams to complete his Ph.D. in Nutrition (2007), he focused on the neuroendocrine networks controlling the relationship between nutrition and reproduction. Ben then moved on to Oregon Health and Science University and subsequently to Vanderbilt University Medical Center to work with Dr. Roger Cone, NAS, to study the neuroendocrine control of food intake. Recently, he joined the faculty in Animal Science at the University of Arizona and is currently establishing research programs that focus on 1) development of an injectable sterilant and 2) neuroendocrine control of feed intake with specific interest in meal initiation.

## CALF PRODUCTION MANAGEMENT STRATEGIES TO IMPROVE RUMEN DEVELOPMENT

Jamison Allen, Ph.D., University of Arizona

**In a nutshell:** 1) Calves are born as functional monogastrics and are incapable of digestion forage-based diets. They must rely on liquid concentrate diet as their rumens prepare for microbial fermentation and digestion. 2) Rumen development in calves is important prior to and immediately after they transition to a total solid feed diet. Level of development, for instance, should coincide with the animal's production purpose (i.e. milk, beef, etc). 3) Pre-weaning and weaning management plays a direct role in the rumen development process. 4) Diet type, available feedstuffs, and feed additives affect rumen development.

**Allen career highlights:** Dr. Allen was born in North Dakota but claims Idaho as his home state. In 2006, he received his B.S. (major: Animal Science; minor: Chemistry) from Brigham Young University – Idaho, followed by his M.S. (Animal Science; emphasis: Animal Nutrition) from the University of Idaho in 2008 and Ph.D. (Animal Science; emphasis: Ruminant Nutrition and Management; minor: Veterinary Science) from the University of Arizona in 2011. Currently, he is a postdoctoral fellow at the University of Arizona. His research interests include calf nutrition and management, bird depredation in animal feeding operations, and animal behavior.



ALLEN

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# KELLY MOSS:

## 2012 OUTSTANDING DAIRY PRODUCER OF THE YEAR

By Ron Goble

**LITCHFIELD PARK, Ariz.** — Kelly Moss was raised on Mountain Shadow Dairy in Litchfield Park, Ariz. and has seen a lot of changes since he was just responsible for feeding calves.

Moss will be honored Thursday, Feb. 23 as 2012 Outstanding Dairy Producer of the Year by *Western DairyBusiness* magazine during the Southwest Nutrition and Management Conference in Tempe.

"I loved growing up here," Moss declared. "This has been my life as long as I can remember. I fed calves and worked on the farm all my life. My father (Alvin) passed away last October and my mother still lives in the house I was raised in on the dairy."

Alvin Moss had been a DHIA tester in California and partnered with John DeGroot to buy his first dairy there. Eventually he decided to relocate to Arizona and started Mountain Shadow Dairy in 1965.

Kelly Moss graduated from high school in 1983, but after about three years decided he wanted to try something else. So he got his engineering degree and worked at it for a summer.

### Coming home

"I realized dairying was in my blood and it was time to stop resisting the call back to the dairy," he recalled. "I came back and started a partnership with my father in 1993."

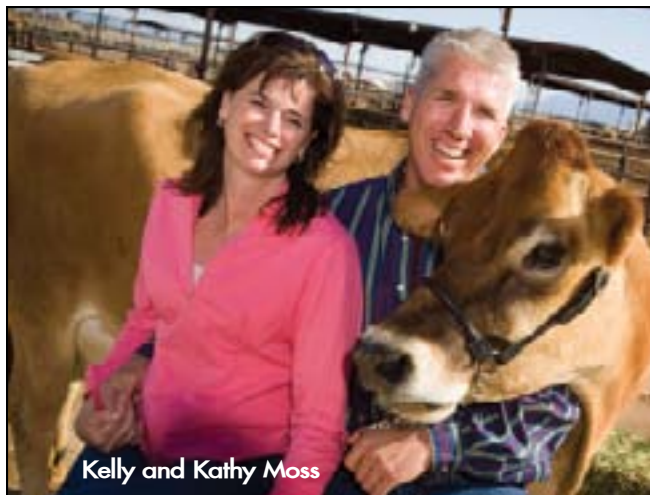
The father and son collaboration flourished and through it all, young Kelly has been instrumental in growing the dairy operation from the 400 registered Jersey cows his father started with some 46 years ago, to the 1,300 Jerseys they milk today.

While there have been a lot of changes, Moss still uses a 1967 International tractor — the first new piece of equipment his father bought for the dairy. They've used that tractor for everything. "It loaded the feed, cleaned the corrals and helped me learn how to drive," Moss declared.

"What I enjoy most about this business are the cows, but milking cows is a means to an end — a quality of life with family as a priority — I'm not driven by it," Moss confessed. "By industry standards, this isn't a large dairy, but I like it that way because I still know my cows. I work with my cows every day and appreciate the ability to produce something that is wholesome, nutritious and a good for people. I love the people I work with here, but also love the industry. If that is what you spend your life doing, you can't do much better than that."

"I'm excited about where we're at right now, and being able to make it all work," Moss said.

"Our operation is the ideal size. We're at the point where we have things dialed in pretty well. My only real concern is for the country's economy and its impact on the dairy industry. I wonder whether our current paradigm can continue to provide for us as it has in the past. We weren't carrying a lot of



Kelly and Kathy Moss

debt going into 2009 and that was a huge advantage."

Moss' RHA is about 17,000 lbs. or close to 60 lbs of milk per cow. In the summer months, production may dip to as low as 40. His herd runs close to 4% protein and 3.43% butterfat. "Our milk goes more to a fluid market with a little bonus for the protein. So my breeding decisions are targeted more toward volume rather than components," Moss said.

### Learning new things

"My decision to come back to the dairy as a 20-something young man wanting to find my place was a good one. My dad wasn't ready to take his hands off the handlebars at that time, so I learned how to do embryo transfers from '93 to '96. I did a lot of flushing of our cows and that was very enjoyable. I think it helped us genetically improve our herd of registered Jerseys," he said.

Toward the end of the '90s, the dairy industry was not that profitable and Kelly voiced his frustrations, working 6 1/2 days a week with not much to show for it. So he started looking at where they were at financially. They had sold a lot of heifers and cows through the years to maintain the herd at between 900 and 1,000 cows.

Their new accountant, Paul Mulder of Genske Mulder Co., questioned why Moss was selling all those cows and heifers, and mentioned it might be worth it to keep them and milk them. "I ran the numbers and it appeared that we would net about \$1,000 per cow per year. At the same time, our 1,000-cow dairy was on just 17 acres and the EPA was pressing us to increase acreage to better handle

our waste water," Moss explained.

They purchased 80 acres from a neighbor and constructed lagoons and two additional pens to handle about 250 more cows.

"It was exciting to see what a big difference those changes made. I think that was a high point for us. After all, it's a lot more fun when you're working hard and actually making money," he said. "After that it was a real challenge and a lot of fun to make that dairy perform without having to spend a lot of money. That's what's been fun these last 10 years, getting to this point and I'm feeling like we have things pretty well dialed in."

"Like most dairyman in the Southwest, I'm looking to vertically integrate more and get into farming to make my feed a little more affordable," Moss said.

In 1973, Alvin put in a Nielsen double-8 herringbone with Germania takeoffs and in early 2006 they added a couple more stalls to give them a double-9 herringbone. Today, they milk 110 cows an hour with two milkers.

Mountain Shadow Dairy herd is all bred AI and the heifers get AI once or twice and then are put in one of four pens with a bull. Moss takes daily milk weights and is on DHIA test every other month. He participates in several young sire programs with various companies for Jersey studs.

Moss is a director on the National All Jersey Board, director at United Dairymen of Arizona, a delegate for COBA Select Sires, an elder at Phoenix United Reform Church, director of the Adaman Mutual Water Co., and a supervisor on the NRCD.

He ships his milk to United Dairymen of Arizona cooperative and Schreiber Foods, Inc. to be made into cheese.

Being a closed herd and only selling animals has been a benefit for Moss. "We haven't been bringing in animals that could possibly introduce diseases to our herd," he said.

In 2001, Kelvin (Kelly) Moss was honored with National Dairy Shrine's Progressive Dairy Award for herds milking more than 300 cows. This award recognizes dairy producers (21-45 years of age) who have introduced and applied effective management and business practices that helped to achieve a more profitable dairy business. By creating awareness of these successes, National Dairy Shrine hopes this award will motivate and encourage other dairy producers to achieve similar goals.

Kelly and Kathy built their own home on the dairy and are raising their six children there. "All boys, except for the five girls," Kelly joked. "Anneke 18, Shelby 15, Sheridan 12, Regan 9, Katie 7, Jackson 5, and a boy on the way." □

# DR. MICHAEL TOMASZEWSKI:

## 2012 OUTSTANDING DAIRY INDUSTRY EDUCATOR/RESEARCHER OF THE YEAR

By Ron Goble

**COLLEGE STATION, Texas** — Dr. Michael Tomaszewski grew up on a small dairy farm in Western Massachusetts and had a career that has taken him to Colorado, North Carolina, and eventually to Texas, where he has dedicated 36 years working on dairy industry research and education projects at Texas A&M University.

Tomaszewski, a Professor and Extension Specialist Emeritus at Texas A&M, will be honored Thursday, Feb. 23 during the Southwest Nutrition and Management Conference in Tempe, Ariz., as the "2012 Outstanding Dairy Industry Educator/Researcher of the Year," an award sponsored by *Western DairyBusiness* magazine.

### Exposed to dairy early

Tomaszewski was exposed to the dairy business at a very young age, however, he explained that his father got caught in the squeeze between milk cans and tanks and didn't want to make the switch. He gave up the dairy for raising beef cattle and growing vegetables. "That was my brief introduction to dairying and I never lost my interest," Tomaszewski said. "I was fortunate to spend time on my uncle's dairy, located just down the road from our farm. He had a 75-cow dairy, which grew to 150 cows in the mid-50s — a pretty good sized dairy in those days."

### Education directs career path

Tomaszewski started his college career at the Stockbridge School of Agriculture at the University of Massachusetts where he earned his associate degree. He studied under Dr. Dick Folley, who he said really turned him onto the diversity of the dairy industry. He earned his bachelor's degree from Colorado State University and then pursued his master's from University of Massachusetts.

He worked in the office of production testing with Dr. Frank Dickinson, an Extension Dairy Specialist in Massachusetts, and during his graduate internship he worked for DHIA. Tomaszewski received his doctorate in dairy cattle breeding at North Carolina State University. While at NCSU he became familiar with the Dairy Record Processing Center at Raleigh, NC. He stayed on at NCSU and did post-doctorate work on sire evaluation techniques and served as a Fullbright Specialist.

### Tomaszewski becomes a Texan

In 1975, Tomaszewski accepted a position in the Animal Science Department at Texas A&M. When he arrived they had four faculty on campus in dairy — two in research and two in Extension positions. He retired in 2007 and was the last professor in the dairy field on campus. Since then, he was asked to develop

an online dairy course, which he was rehired to teach on a part-time basis. He also teaches a campus-based introductory dairy management course.

His online course started with no students, but last year, had 140 students taking the class. This school year, he has had continued high interest in the dairy course. "We're not trying to teach students the intricacies of dairy management, rather it is an introductory course that is exposing a wide variety of student who wouldn't ordinarily have access to a dairy course," he said. Because of his part-time status, Tomaszewski is considered a "visiting professor," and Extension Specialist Emeritus on campus.

In addition, Tomaszewski coordinates the Southern Great Plains Dairy Consortium for Texas A&M — teaching, which is a cooperative effort among 11 universities to provide courses in large herd management.

### Always pushing technology

Looking back at his career, Tomaszewski said he gains great satisfaction in being able to recognize the impact that computers were going to have on dairy herd management as early as the late 1970s. "I remember trying to push the university to move in that direction and hitting a stone wall at the processing center. PCs are too expensive and too complicated," he was told. "It was a fight. So it's great to see how intricate and vital computers are today in dairy herd management. I can look back and say, I was ahead of the curve on that baby!"

He also cited his involvement with DHIA in Texas. "When I arrived in Texas there were only about 35,000 cows on DHIA test. I saw that number grow into a strong program with more than 200,000 cows on test by the turn of the Century," he said.

### A new way to teach

Tomaszewski was also instrumental in helping get the Southern Great Plains Dairy Consortium up and running. In 2005-06, discussions were initiated concerning the Consortium and Tomaszewski was the point person for that effort at Texas A&M.

"We are excited to see the Consortium growing and working well. The enthusiasm by industry and producers, is encouraging while student numbers are increasing every year. We are looking at a new and different way to teach dairy management in an area of the country where dairy is important, but yet when you try to persuade a university to step up and take leadership, we're not seeing that right now. It is going to have to be an industry, producer, university partnership to make it happen. Potentially, the Consortium could be an example of how this will be successful here, as well as other parts of the country."



"The first year there was some hesitation to get involved. But each successive year, there has been more and more acceptance by producers," he observed. "This past year there were four producers' sons that were from universities in the area who could attend the Consortium, where the first year we didn't have any. So I think we've had a tremendous buy-in by our dairy producers now, seeing the importance of what can happen through what we are trying to teach with the Consortium. The decline in dairy programs at many universities is a very serious problem today."

Tomaszewski said they had students attend the Consortium from California, Florida, Washington, Idaho, Colorado, Kansas and Michigan, in addition to those from the Southwest region of Texas, New Mexico and Arizona. He said the program, in its current structure, is nearly maxed out at 50 students.

Tomaszewski has received numerous honors and awards, including the Association of Former Students' Distinguished Achievement Award in Continuing Education, the Vice Chancellor for Agriculture's Distinguished Achievement Award for Team Research, the Texas Agricultural Extension Service's Superior Service Award and the National DHIA Outstanding Service Award. He also received the 2003 Vice Chancellor's Award in Excellence for Special Services for his contributions to the DHIA program.

He has been recognized for his early leadership in the use of microcomputers for on-farm decision making, and he has been a member of numerous National Dairy Herd Improvement and National Cooperative Dairy Herd Improvement Policy Board task forces and committees.

Professional memberships include the American Dairy Science Association and Sigma Xi.

He and wife, Elizabeth, have three daughters: Lesley, who has her Ph.D., in adult education, Jeanne with a Ph.D., in environmental engineering and Kathryn, who has her bachelor's in interior design. Elizabeth was reared on a family dairy in Florida. □

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