SNACK AND FACT:

MILK—Not Just Another Food

June 2, 2014 / House Agriculture Committee
1300 Longworth House Office Building / Washington, DC

Hosted by the American Society of Animal Science

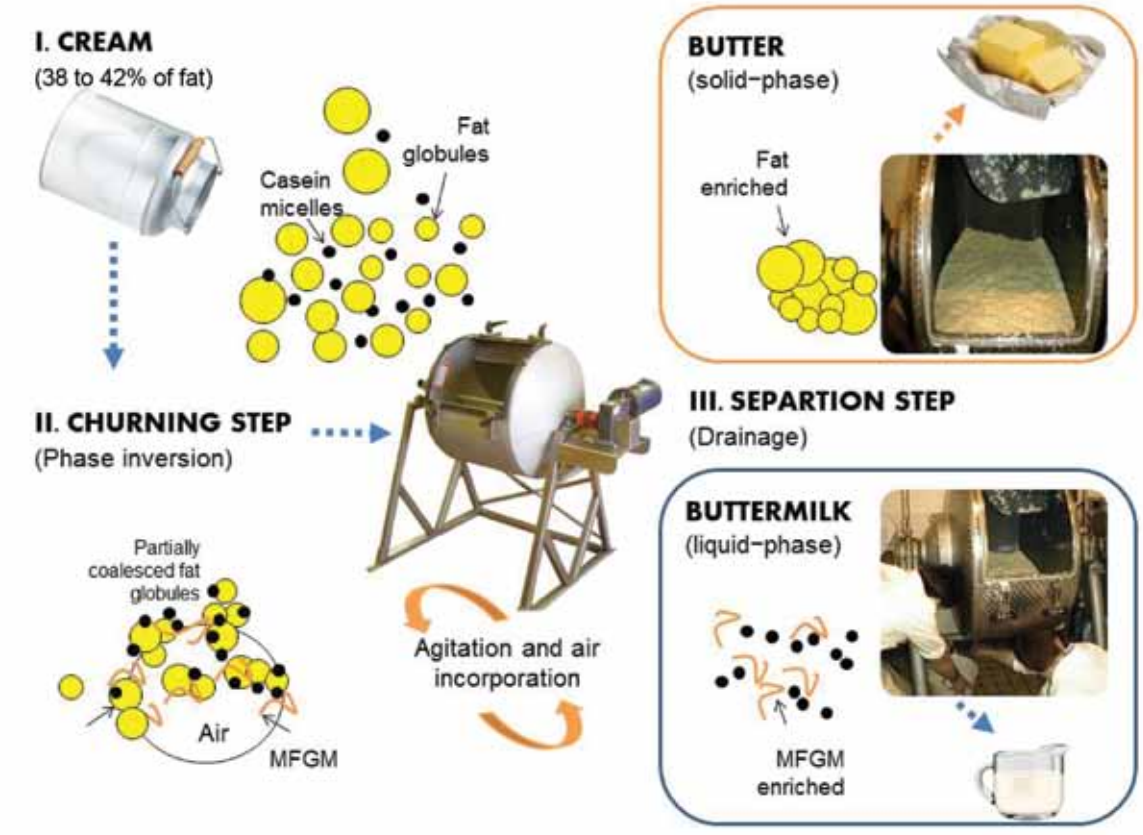
Schedule

12:35 to 12:40
Introduction and Goals
Dr. Deb Hamernik (University of Nebraska), ASAS Public Policy Committee Chair

12:40 to 1:05
Milk—Not Just Another Food
Dr. Connie Weaver (Purdue University)

The important nutritional value of milk, as well as its increased availability, has led to increased consumption of milk throughout the world. The April 2014 issue of *Animal Frontiers* (volume 4 number 2) summarizes the current state of knowledge on the nutritional value of milk, recommendations on the amount of milk in a balanced diet, and the potential role of milk in human health and disease.

Historically, milk was obtained from dairy species as a convenient source of food without having to slaughter animals. Humans are the only species that consume milk throughout life—most mammals stop drinking milk after weaning. In some humans, the gene for the enzyme lactase is switched off and prevents digestion of lactose (the major sugar in milk). The recent availability of draft genome sequences for cattle and humans and studies of lactose tolerance in Europeans provides evidence of a gene-culture coevolution between cattle and humans, suggesting the importance of milk as a survival advantage for farmers and ranchers compared to hunters and gatherers.



Milk is an excellent medium for microbial growth and in the 19th century, consumption of milk became associated with a range of diseases, including scarlet fever, cholera, typhoid, and tuberculosis. Pasteurization (heating) of milk to destroy pathogens and increase the safety and shelf-life of milk has led to wide distribution and consumption of milk throughout the world.

Although heating milk destroys pathogens and increases the safety of milk, heat treatment also inactivates some milk proteins that prevent allergies or asthma. Children that grew up on farms and consumed milk directly from the farm have fewer allergies compared to children that grew up in urban areas and consumed pasteurized milk. Heating farm milk does not provide protection from allergies or asthma. However, raw milk is not commercially available because the incidence of pathogens such as *Salmonella, Listeria, Mycobacterium, Campylobacter,* and others are significant threats to public health and safety. New technologies are being developed to process milk to remove pathogens, without altering the bioactivity of important proteins that contribute to immune function.

Bovine milk provides a significant contribution of vitamin A (retinol), vitamin D (calciferol), vitamin B_2 (riboflavin), vitamin B_5 (pantothenic acid), vitamin B_9 (folic acid), and vitamin B_{12} (cobalamine) to the human diet. Milk is also an important source of minerals, especially calcium and phosphorus. Milk can also be a good source of selenium, but the concentrations of this trace element can be quite variable.

The best evidence on associations between milk and dairy consumption and health and survival, comes from studies of cohorts and case-controlled studies. Based on these studies, consumption of milk poses no health risks, and is an important source of nutrients to promote growth of children and reductions in blood pressure, cardiovascular disease, diabetes, and colorectal cancer in adults. In an isoenergetic diet, milk does not lead to an increase in body weight. Colostrum (or first milk) contains antibodies and other proteins that provide passive immunity and help protect newborn- animals from infectious diseases.

When milk is processed for human consumption, several co-products are generated. These co-products include whey proteins from production of cheese and buttermilk from production of butter. Supplements of whey protein in the human diet can improve body composition (maintain lean muscle mass and reduce fat) in healthy adults and in those performing resistance training. Buttermilk also has been shown to contain unique bioactive molecules that play a role in modulating cell signaling, lipid transport, metabolism and immunity thereby leading to health-promoting effects such as reducing blood pressure and decreasing plasma cholesterol, and contributing to improved cardiovascular health.

Additional science-based evidence of the role of milk in human health and disease is available at: http://animalfrontiers.org/content/current.

Connie M. Weaver, PhD

Dr. Weaver was named professor and head of the Department of Nutrition Science, Purdue University in August 1991. In 2000, she became a Distinguished Professor in the department. Also in 2000, she was appointed director of a National Institutes of Health-funded Botanical Research Center to study dietary supplements containing polyphenolics for age-related diseases. In 2008 she became Deputy Director of The Indiana Clinical and Translational Sciences Institute. In 2010, she was elected to the Institute of Medicine of the National Academy of Science. In 2010, she was appointed to the Food and Nutrition Board.

Her research interests include mineral bioavailability, calcium metabolism, and bone health. Dr. Weaver was appointed to the 2005 U.S. Dietary Guidelines Advisory Committee, and she served on the National Academy of Sciences Food and Nutrition Board Panel to develop new recommendations for requirements for calcium and related minerals. She has published over 300 original research articles and 100 book chapters and reviews. Dr. Weaver is past-president of the American Society for Nutritional Sciences and is on the Board of Trustees of the International Life Sciences Institute. Dr. Weaver received a Bachelor of Science and Master of Science in food science and human nutrition from Oregon State University. She received a PhD in food science and human nutrition from Florida State University and holds minors in chemistry and plant physiology.