



ASAS-CSAS Annual Meeting Albuquerque, NM · July 16–20, 2023



SYMPOSIA LIST BY DAY

SUNDAY, JULY 16, 2023 – ALL DAY

ASAS-NANP Pre-Conference Symposium: Mathematical Modeling in Animal Nutrition: Training the Future Generation in Data and Predictive Analytics for a Sustainable Development

- Tami Brown-Brandi, University of Nebraska-Lincoln – Creating Sensor Systems for Real Time Animal Management.
- Dr. Marcia Fernandes, São Paulo State University – Satellite-based decision support tools to assist grazing cattle production.
- Dr. Edgar Oviedo, North Carolina State University – Overview of poultry modeling evolution.
- Dr. Wade McDonald, University of Saskatchewan – Hands-on I: Building an Agent-Based Model in AnyLogic.
- Dr. Alberto Atzori, University of Sassari – Hands-on II: The role of system dynamics modeling for sustainable livestock production.
- Dr. Jian Tao, Texas A&M University – Hands-on III: Building digital twins for precision livestock farming: Data analytics and big data challenges.

SUNDAY, JULY 16, 2023 – AFTERNOON

WSASAS Beef Symposium: Climate Adaptation Strategies for the Beef Industry of the Great Plains and Western US

Increasing frequency and intensity of weather extremes is placing pressure on the beef industry, from cow-calf ranches to stocker operations and the feeder/finishing sector. Scientists and industry representatives will discuss advances in genetics, feeding, and management strategies (including the use of digital technologies) as they relate to climate adaptation in the Plains area. Also addressed will be advances in mitigation of GHG emissions (both enteric and manure-derived) across the industry. The symposium will conclude with a round table to discuss needs, knowledge gaps, and challenges for Great Plains beef moving forward relative to scenarios of future climates in the region.

- Dr. Glynn Tonsor and Jaime Luke, Kansas State University – Contribution of the beef industry to the economy of the Great Plains and Western US: Past, present, and future.
- Dr. Sara Place, Colorado State University – Impacts of future climate scenarios on the beef industry of the region.
- Dr. Justin D. Derner, USDA-ARS, Fort Collins – Practical considerations for adaptive strategies by United States grazing land managers with a changing climate.
- Eileen Armstrong, Universidad de la Republica, Uruguay – What role could old/heritage genetics play in climate adaptation?



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- Santiago Utsumi, New Mexico State University – Precision Livestock Farming tools for climate-smart ranching.
- Dr. Glenn C. Duff, New Mexico State University – Tools for climate-smart decision making for the stocker/feedlot sector.
- Dr. Luis O. Tedeschi, Texas A&M University – Precision Livestock Farming tools for climate-smart feed yard operations.
- Dr. Derrell Peel, Oklahoma State University – Regional beef supply chain vulnerabilities to climate change.

MONDAY, JULY 17, 2023 – MORNING

Beef Species Symposium I: Greenhouse Gas Accounting Methods and Their Implications for the Beef Industry

This symposium will discuss accounting methods of importance to beef cattle. These accounting methods will include Life cycle assessments and the merits for employing alternative metrics used to relate short-lived climate forcers, such as methane, to CO₂ equivalences. This topic is of utmost importance because it is these emission estimates and equivalences that policymakers will consider when drawing conclusions about the importance of different greenhouse gas sources.

- Dr. Matthew R. Beck, USDA-ARS – Methane accounting and its importance to the beef industry's implied contribution to climate warming.
- Dr. C. Alan Rotz, USDA-ARS – Beef cattle and global warming.
- Dr. Terra Campbell, USDA-ARS – Greenhouse gas emission measurement and modeling in complex beef production systems.

Comparative Gut Physiology Symposium: Hormones in Nutrient Uptake and Utilization

This symposium will provide an update on gut hormones and their effect on integrating whole animal responses to nutritional uptake and utilization (The gut as the 2nd brain in the body). This could be related to energy balance (feed intake and energy metabolism in tissues throughout the body), appetite control, and nutrient partitioning.

- Dr. Samat Amat, North Dakota State University – Effects of the maternal gut and reproductive microbiome on postnatal development in ruminants.
- Dr. Mark Lyte, Iowa State University – Evolutionary-based neurochemical intersections of microbiology and neurobiology in the gut matter to infection, behavior and nutrition.
- Dr. Hannah Crocker Cunningham, University of Wyoming – TBD
- Dr. Phillip R. Myer, University of Tennessee – Role of the rumen microbiome in beef cattle gut physiology and performance.
- Dr. Jiangchao Zhao, University of Arkansas – TBD



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Nonruminant Nutrition Symposium: Advances in Nutrition of Developing Gilts and Breeding Sows: How Changing Genetics Influence How Feeding Developing Gilts

- Dr. Uislie Orlando, Genus PIC – Importance of good sow development–focusing on nutrition and feeding from gilt development to subsequent parities.
- Dr. Chantal Farmer, Agri-Food Canada – Feeding gilts and sows to maximize their mammary development.
- Dr. Jeremy Cottrell, University of Melbourne – Identification of how future climates may impact the reproductive herd and what this may mean for nutrition.
- Dr. Hyatt Frobose, JYGA – Precision feeding in modern sow farms: Where are we headed?

Physiology and Endocrinology Symposium: An Update on The Brain: New Insights into the Inner Workings of The Hypothalamus and Pituitary

There have been a few major discoveries that have greatly improved our understanding of the hypothalamic-pituitary-gonadal axis, and a symposium that highlights some of these discoveries seems like a very fitting way to bring non-neuroendocrine people up to speed on these discoveries. This symposium will highlight the neuroendocrine work being done and feature speakers who have developed well-funded and well-respected research programs focusing on neuroendocrinology in cattle and pigs.

- Dr. Rodolfo Cardoso, Texas A&M University – Effects of gestational and postweaning nutrition on brain development and puberty in beef heifers.
- Max Griesgraber, West Virginia University – Role of KNDy and Arcuate Kiss1r-containing Neurons in the Preovulatory Luteinizing Hormone Surge and puberty onset of female sheep.
- Dr. Clay A. Lents, USDA-ARS MARC – The kisspeptin knockout pig: A new model for dissecting mechanisms controlling reproduction.
- Daniel F. Ahern, University of Nebraska – Neurokinin B, kisspeptin, and GnRH hormone analogs fail to stimulate secretion of luteinizing hormone (LH) in KISS1 knockout boars.
- Michelle Bedenbaugh, Vanderbilt University – Melanocortin 3 receptor in neural circuits linking metabolic state with reproduction and growth.
- Allison Renwick, University of Tennessee – The effects of disease-induced inflammation on reproductive neuroendocrinology: evidence from sheep.
- Dr. Nathan Long, Clemson University – The role of leptin and its regulation in the hypothalamus of neonatal calves.
- Dr. Casey Nestor, North Carolina State University – Central regulation of KNDy neurons during undernutrition in sheep.



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MONDAY, JULY 17, 2023 – AFTERNOON

Animal Behavior and Well-Being Symposium: Gene Editing—A Tool for Increased Animal Welfare and Human Health

- Dr. Vimal Selvaraj, Cornell University – Induced pluripotent/totipotent stem cells: inexhaustible genetic stocks for regeneration and development of regionally adapted climate-resilient livestock.
- Dr. Charles Long, Texas A&M University – TBD
- Dr. Bhanu Telugu, University of Missouri – TBD
- Dr. Tad Sonstegard, Acceligen – Developing new traits using precision breeding tools.
- Dr. David Ortega, Michigan State University – Navigating the biotechnology landscape in animal agriculture: Consumer and producer acceptance of gene editing to improve farm animal welfare.

Beef Species Symposium II: Genetic and Management Strategies for Reduced Beef Production Environmental Impact

The global demand for beef is rapidly increasing, raising concern about climate change impacts. Increased productivity without an increase in resources used, is the best strategy to meet global dietary needs affordably and sustainably and minimize the negative environmental impact of livestock. Advances in genetics, nutrition and disease control have been driving the tremendous increases in global livestock productivity. The symposium will provide an overview of genetic and management strategies for reduced beef production environmental impact.

- Dr. Megan Rolf, Kansas State University – Genetic selection for water intake in beef cattle.
- Dr. Matt Spangler, University of Nebraska-Lincoln – Genetic selection for improved profit conditioned on enterprise-specific circumstances.
- Dr. Nicolas DiLorenzo, University of Florida – Environmental impact of improving forage use efficiency in beef cattle.
- Tom McDonald / Jessica Langley, 5 Rivers / JBS – TBD

Small Ruminant Symposium: Precision Sheep Management: Moving from Research to Application

Production systems across the U.S. sheep industry are incredibly diverse and each have unique constraints which impact flock profitability and sustainability. Technological advancements have enabled researchers to more precisely measure nutritional requirements, behavior, reproductive physiology, and genetic diversity and to evaluate the impact of husbandry changes and selective breeding on productivity, health, and the environment. However, moving research to application can be challenging. This symposium will present novel research findings with a larger discussion on strategies to implement change at the producer and industry level.

- Dr. Sarah Adcock, University of Wisconsin-Madison – Application of real-time location systems for automated behavioral monitoring in sheep.



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- Dr. Andrew Hess, University of Nevada-Reno – Developing precision agriculture tools to capture behavior and performance in extensively managed sheep.
- Dr. Richard Ehrhardt, Michigan State University – Precision feeding of prolific sheep in highly productive management systems.
- Dr. Whit Stewart, University of Wyoming – Precision trace mineral management in extensive sheep systems.
- Dr. Bret Taylor, USDA-ARS, US Sheep Experiment Station – Beyond environmentally adapted, towards ecologically purposed: Sheep production in the US West.

Swine Species Symposium: Emerging Technologies in Swine Production

This symposium will provide an overview of recent technologies developed for use by the swine industry. Speakers will focus on the use of technologies that may improve aspects of swine health, welfare, nutrition, and reproduction.

- Dr. Janice Siegford, Michigan State University – Does automated behavioral monitoring inevitably lead to improved pig welfare?
- Dr. Guilherme Rosa, University of Wisconsin-Madison – Leveraging big data analytics to improve disease surveillance and welfare in livestock.
- Dr. Isabella Condotta, University of Illinois at Urbana-Champaign – Swine precision nutrition: How computer vision can help.
- Dr. Karl Kerns, Iowa State University – Current and future state-of-the-art methods for assessing boar fertility.

TUESDAY, JULY 18, 2023 – ALL DAY

Animal Breeding and Genetics Symposium I: The Central Dogma of Phenomics?

Phenomics is a genome wide study of phenotypic dynamics during the life span of an organism. The central dogma of quantitative genetics describes phenotype (P) as a function of genotype (G), environment (E) and their interaction or $P = G + E + G \times E$. On the other hand, the central dogma of molecular genetics states that DNA makes RNA makes protein. Recent advances in both fields have indicated that environments affect the expression and function of genes underlying complex traits, causing phenotypic variation. Therefore, what is the central dogma of phenomics?

This symposium will provide a valuable opportunity for a broad community to discuss: 1) What is the study of phenomics; 2) What are challenges in studying phenomics; 3) What are currently available tools and resources to study phenomics; 4) How phenomics studies have advanced in domestic animals and 5) What is the central dogma of phenomics?

- Dr. Brenda Murdoch, University of Idaho – The power of pangenome assemblies in ruminants.
- Dr. Stephanie McKay, University of Vermont – Establishing a pan-epigenome for cattle and sheep.



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- Dr. Michael P. Phelps, Washington State University – Large-scale CRISPR functional characterization of genomic elements in rainbow trout (*Oncorhynchus mykiss*).
- Dr. Hao Cheng, University of California, Davis – Mixed-effects multilayer neural networks for genome-wide analysis including intermediate omics data in the central dogma of phenomics.
- Dr. Peter Sutovsky, University of Missouri – Biomarker-based high throughput sperm phenotyping: The good, the bad and the ugly.

Animal Breeding and Genetics Symposium II: The Central Dogma of Phenomics?

- Dr. Guilherme J. M. Rosa, University of Wisconsin-Madison – Integrating enviromics, genomics, and machine learning for precision breeding of resilient beef cattle.
- Dr. John P. McNamara, Washington State University – The bigger picture of phenomics: Whole-system support for systems research, models and databases.
- Dr. Steve Miller, University of New England – From Big to Bigger data, the quest to lift genomic prediction accuracy in livestock.
- Dr. Breno Fragomeni, University of Connecticut – How to use novel phenotypes and environmental factors to evaluate complex traits.
- Dr. Christopher K. Tuggle, Iowa State University – The AG2PI vision for resources in agricultural genomics and phenomics: How ASAS can contribute.

TUESDAY, JULY 18, 2023 – MORNING

ASAS Diversity, Equity, and Inclusion Symposium: Inclusive Excellence in Education

- Dr. Teresa Maria Linda Scholz, New Mexico State University – TBD
- Aaron Salas, New Mexico State University – TBD
- Dr. Nicole Tillquist, University of Connecticut – A student perspective on the importance of inclusive pedagogy.

Companion Animal Symposium I: What We Know and What Is Next for NRC, AAFCO, and FEDIAF

In North America, regulatory recommendations for pet food formulation are defined by the Association of American Feed Control Officials (AAFCO), while the European Pet Food Industry Federation (FEDIAF) establishes the regulatory guidelines in Europe. These recommendations are developed in consideration of the information presented in the National Research Council's (NRC) Nutrient Requirements of Dogs and Cats, which was published in 2006. While both AAFCO and FEDIAF often revise and rerelease updated guidelines, based on the progression of research in canine and feline nutrition since 2006, amendments to the nutrient requirements of dogs and cats as established by the NRC are overdue, which would surely affect the practical recommendations proposed by these regulatory bodies. Moreover, as new trends are introduced to the pet food industry each year, it is becoming increasingly more challenging for those in the pet food industry to navigate the regulatory aspects of utilizing novel ingredients or manufacturing pet food to be shipped globally. As such, the objectives of this symposium are to



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provide an overview of what the future may hold for the NRC, AAFCO, and FEDIAF as well as to explore the current regulatory aspects of essential practices in the pet food industry such as novel ingredient approval.

- Dr. Liz Koutsos, EnviroFlight – AAFCO approval and regulatory process for novel ingredients.
- Dr. Dottie Laflamme – Life stage feeding: Is there a path forward for senior/geriatric nutrient recommendations?
- Dr. Júlia Guazzelli Pezzali, Iowa State University – Sulphur Amino Acids: Assessing requirements and utilization in dogs and cats.
- Dr. Jarrod Kersey, Simmons Pet Food – Implications of regulations, consumers and companies on dog and cat nutrition.

CSAS Symposium I: Emerging Technologies and Strategies that Optimize Livestock Research

- Dr. John Church, Thompson Rivers University – Emerging precision ranching technology is enabling the development of a “smart” biome.
- Dr. Jennifer Clarke, University of Nebraska-Lincoln – TBD
- Dr. Guilherme J. M. Rosa, University of Wisconsin-Madison – Digital technologies and Machine learning: A new way to look at novel traits at spatial and temporal dimensions.
- Dr. Dan Tulpan, University of Guelph – Machine and deep learning modelling strategies for body weight prediction of cattle and swine.

Ruminant Nutrition Symposium: Current and future perspectives on nutritional management in the beef cow-calf sector

This symposium aims to explore the current understanding, recent advances, and gaps in knowledge related to the efficiency of the cow-calf sector. This sector requires the greatest input of feed resources in the beef industry. Despite this, nutrient requirements of the cow and pre-weaned calf is the least understood and researched area of modern beef cattle nutrition. In this symposium the speakers will explore the current understanding of forage utilization efficiency of gestating and lactating cows, the efficiency of nutrient partitioning, defining efficiency, and clearly state the areas that need further research.

- Dr. Harvey Freetly, USDA-ARS – The Stochastic Cow: The variable coefficient for calculating maintenance energy.
- Dr. Daniel W. Shike, University of Illinois at Urbana-Champaign – Confinement and drylot housing for cow-calf production: advantages, challenges, and future research needs.
- Dr. David Lalman, Oklahoma State University – Identifying forage efficient cows.
- Dr. Eric J. Scholljergdes, New Mexico State University – Management strategies for beef cows and heifers grazing arid rangelands.
- Dr. Allison Meyer, University of Missouri – Nutrient use in the beef cow and calf: opportunities and challenges.



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TUESDAY, JULY 18, 2023 – AFTERNOON

CSAS Symposium II: Meat Protein Alternatives: Exotic Species (E.G. Rabbit, Elk, Deer, Llama, Water Buffalo...)

- Dr. Jayson Galbraith, Alberta Agriculture and Irrigation, Animal Health and Assurance Branch – Meat options for dinner: The road less travelled (Bison edition).
- Dr. Argenis Rodas-Gonzalez, University of Manitoba – Critical comparison of water buffalo (*Bubalus bubalis*) and cattle on growth performance and carcass traits: A review.
- Dr. Huerta Nelson, Texas Tech University – Eating and nutritional quality of meats from water buffalo versus cattle: A review.
- Dr. Hugo Fernando Lopez Arevalo, National University of Columbia – Advances, challenges and prospects for the sustainable use of the chigüiro in Colombia.

Growth and Development Symposium: Functional Amino Acids in the Growth, Development, and Health of Animals

Emerging research has implicated amino acids as more than just building blocks of proteins. Instead, they are powerful signaling molecules that have independent effects on skeletal muscle growth and function. A cross-species symposium will be presented highlighting recent work in this area and then extending this understanding into human health.

- Dr. Lucas Alves Rodrigues, Zinpro Corporation – Functional amino acids in pigs: Much more than building blocks for muscle protein deposition.
- Dr. Samuel J. Rochell, Auburn University – Precision nutrition to enhance poultry performance and health: The role of functional amino acids.
- Dr. Marcio Duarte, University of Guelph – The potential of dietary guanidinoacetate in beef cattle to manipulate skeletal muscle development and metabolism.
- Dr. Júlia Guazzelli Pezzali, Iowa State University – Functional amino acids in dogs and cats: Implications for overall health.

Teaching/Undergraduate and Graduate Education Symposium: Connecting Experiential Learning with Employment Opportunities—What Industry Wants Us to Know

Animal Science programs have devoted a great deal of attention to revising curricula to serve the students of today. An important part of that curricula, and arguably the most direct path to employment may be experiential learning. While many courses have changed and teaching methodologies have adapted, the format and expectations for experiential learning may not have changed as much, which raises the question—how do we keep experiential learning aligned with employer’s expectations? Hearing from industry leaders about the knowledge, skills, and values that they are looking for in our undergraduate and graduate students will help instructional faculty to evaluate existing experiential learning and determine if revision and/or creation of new opportunities may better serve our students. Similarly, hearing from faculty who have created and/or are operating successful experiential learning programs will provide



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possible templates by which we can expand/improve our existing programs to better serve our students. This will be targeted to both graduate and undergraduate programs.

- Rachel Cutrer, Ranch House Designs, Inc. and B.R. Cutrer, Inc. Brahman Cattle Seedstock – TBD
- Dr. Leah Lambrakis, Simmons Pet Food and Animal Nutrition – Do Real Work.
- Dr. Nicole Oosthuizen, ABS Global – Setting students up for success in the agricultural industry.
- Dr. Tryon Wickersham, Texas A&M University – Creating context and vision in Animal Science graduates.

WEDNESDAY, JULY 19, 2023 – AFTERNOON

ASAS-NRCS Symposium: Conservation Connections: Where Animal Science Meets Practice Innovation

There is a need for dialogue and information sharing among researchers, practitioners, and policymakers regarding technologies and practices that are available to advance livestock production, improve resource management, and apply technologies and approaches to further U.S. food and agriculture enterprises. This symposium will showcase recent technologic advances in livestock management with promise for innovation in practices that address climate change and natural resource concerns. Discussion includes three themed panels. The first panel highlights recent innovations in feed management to address climate change. The second panel addresses NRCS conservation planning and practices related to livestock and climate change. The third panel explores what is critical to ensure that producers effectively harness conservation technologies.

- Dr. Sara Place, Colorado State University – Leveraging Feed Technologies to Reduce Methane Emissions from Livestock
- Kristi Cammack, South Dakota State University – Creating Market Opportunities with Climate-Smart Agricultural Practices
- Greg Zwicke & Renee Leech, ARS-NRCS – Opportunities for Conservation Research Support, Feed Management Planning and Practice Cost Sharing
- Julie Adamchick, Word Wildlife Fund – A Strategy for a Climate-Resilient Sustainable Feed System
- Leah Wilkinson, American Feed Industry Association – Incentivizing and Aligning U.S. Industry to Drive Change



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Beef Species Symposium III: Advances in Beef Production Efficiency

Strategies to improve the efficiency of cattle production are a prerequisite for the sustainable intensification needed to satisfy the future demand for beef. The symposium will provide an overview of recent advances in beef production efficiencies focused on energetic efficiency, nutrient use efficiency (e.g., nitrogen), and ways to reduce inefficiencies.

- Dr. Jason Smith, Texas A&M University – Opportunities to improve nutrient use efficiency of beef cattle and promote environmental stewardship through ration optimization.
- Dr. Andrew Foote, Oklahoma State University – Physiological mechanisms related to feed efficiency of beef cattle.
- Dr. Amanda K. Lindholm-Perry, USDA-ARS – Leveraging the potential of molecular and genetic markers to improve feed efficiency in beef cattle.
- Dr. Logan Thompson, Kansas State University – Grazing management–tools for improving the efficiency of grazing beef production.

Companion Animals Symposium II: Comparative Nutrition: Animal Protein from Different Perspectives

Historically, animal protein has been a major component of pet foods. Many discussions have been had regarding the sustainability of animal protein ingredients and their nutritional quality in companion animal diets. While these are important questions to be answered, very few conversations are had from other perspectives, including the fields of meat science and captive and wild exotic animals. Therefore, the objective of this symposium is to share research from fields other than companion animal nutrition regarding the use of animal proteins and other animal-based nutrient sources and discuss the implications to food for companion animals.

- Dr. Elisabeth Huff Lonergan, Iowa State University and Dr. Carl Frame, Kemin Nutrisurance North America – Implications of processing and handling on the functionality of animal derived products for pet foods.
- Dr. Cheryl Morris, Iowa State University – Animal based ingredients in diets for captive exotic animals.
- Dr. Ellen Dierenfeld, World Wildlife Foundation – Sustainable feeding solutions across the animal kingdom: Identifying and implementing.
- Dr. Shawn Wilder, Oklahoma State University – Nutritional ecology of arthropod predator-prey interactions.



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Meat Science and Muscle Biology Symposium: Relationships Between Mitochondrial Energetics, Muscle Biology, and Meat Quality

- Dr. Sarah White-Springer, Texas A&M University – Live animal mitochondria: A target for production optimization.
- Dr. Tracy Scheffler, University of Florida – Mitochondria: Life, death, and the in-between.
- Dr. Chaoyu Zhai, University of Connecticut – Mitochondrial changes with feed additives and pulmonary hypertension.

THURSDAY, JULY 20, 2023 – MORNING

Animal Breeding and Genetics Symposium III: The Central Dogma of Phenomics?

Phenomics is a genome wide study of phenotypic dynamics during the life span of an organism. The central dogma of quantitative genetics describes phenotype (P) as a function of genotype (G), environment (E) and their interaction or $P = G + E + G \times E$. On the other hand, the central dogma of molecular genetics states that DNA makes RNA makes protein. Recent advances in both fields have indicated that environments affect the expression and function of genes underlying complex traits, causing phenotypic variation. Therefore, what is the central dogma of phenomics?

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- Dr. Huaijun Zhou, University of California, Davis – Dissection of evolution of cis-regulatory elements and its application on genetic control of complex traits in farm animals.
- Dr. Fernando H. Biase, Virginia Polytechnic Institute and State University – Molecular phenomics—a multi-omics approach to understanding complex traits in cattle.
- Dr. Darren E. Hagen, Oklahoma State University – Noncoding RNAs alter our Interpretations of genome to phenome.
- Dr. Angelica Van Goor, USDA NIFA – Animal genomes to phenomes: Funding and perspectives from USDA-NIFA
- Dr. Zhihua Jiang, Washington State University – The central dogma of phenomics: $P = G + R + E + G \times R \times E$?



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ARPAS Symposium: Liver Abscesses in Cattle

Liver abscesses continue to be a huge problem in the beef industry and with the recent Foundation for Food and Agriculture Research - ICASA funding there has been more research on this topic the past few years.

- Zach S. McDaniel, Texas Tech University – Development of an experimental model to induce liver abscesses in steers using an acidotic diet challenge and oral bacterial inoculation.
- Zach S. McDaniel, Texas Tech University – The effects of roughage neutral detergent fiber concentration and bulk density of steam-flaked corn on performance, carcass characteristics, and liver abscesses in finishing beef steers.
- Ashley A. Hoffman, Texas Tech University – Using a novel direct-fed microbial as an alternative for tylosin phosphate to control liver abscesses and decrease antimicrobial use in finishing beef steers.
- Dr. Lee J. Pinnell, Texas A&M University – Fusobacteria, Bacteroidetes, and more! Linking the microbial communities in bovine liver abscesses to the gut.
- Dr. Jacques M. Mathieu, Rice University – Development of a bacteriophage-based feed additive to prevent bovine liver abscesses.
- Dr. Rand Broadway, USDA-ARS – Development of a novel, experimental, minimally invasive model to investigate the genesis and etiology of liver abscesses in cattle.