

**POSTER PRESENTATIONS**
RAW UNFORMATTED SCIENTIFIC PROGRAM

(12/22/23)

Monday, March 11, 2024**Poster Session I**
8:15 AM - 9:00 AM
Grand Terrace

8:15 a.m. PS-1 **An evaluation of Sodium Salicylate in the Periparturient Management of the sow**

Lauren Olson¹, Eric Weaver¹
¹South Dakota State University

8:15 a.m. PSI-2 **Daily thermoregulatory performance patterns of Duroc boars with or without electronically controlled floor cooling pads during the peak summer heat stress period**

Daphne Licuan¹, Kara R. Stewart², Jamie Hundley³, RJ Nepomuceno⁴, Matt Robins⁴, Randolph Crasto⁴, Bradley A. Didion⁵, Michael Kleve-Feld⁶, Jung Y. Sung⁷, Allan P. Schinckel²
¹Purdue University Department of Animal Sciences, ²Purdue University, ³Pig Improvement Company Inc., ⁴Innovative Heating Technology, ⁵Genus plc, ⁶PIC North America, ⁷Department of Animal Sciences, Purdue University

8:15 a.m. PSI-3 **Effect of feed and water consumption patterns during the lactation period on wean-to-estrus interval in weaned sows**

Magdiel Lopez Soriano¹, Caleb J. Grohmann², Timothy J. Safranski²
¹University of Missouri - Columbia Swine Extension, ²University of Missouri - Columbia

8:15 a.m. PSI-4 **Evaluation of chemical mitigants when soybean meal was inoculated with porcine epidemic diarrhea virus, porcine reproductive and respiratory virus, and Seneca Valley virus 1**

Olivia Harrison¹, Jianfa Bai¹, Martee Larson¹, Roman Pogranichniy¹, Francisco Domingues², Nicole Holcombe², Othmar Lopez², Cassandra K. Jones¹
¹Kansas State University, ²Anitox Corporation

8:15 a.m. PSI-5 **Evaluation of EhV (surrogate for African swine fever virus) inactivation in corn- and soybean-based feed ingredients and diets at various times and temperatures during storage**

Christian Ramirez¹, Declan Schroeder¹, Gerald C. Shurson², Pedro E. Urriola³
¹UMN, ²University of Minnesota, ³University of Minnesota

8:15 a.m. PSI-6 **Growth performance of weaned pigs fed an activated zinc oxide to replace pharmacological content of dietary zinc oxide**

Christian Ramirez ¹, Charlotte Heyer ², Daniel Berghaus ³, Hayford Manu ⁴, Pierre Frumholtz ², Pedro E. Urriola ⁵

¹UMN, ²Provita Supplements Inc., ³ISF GmbH, ⁴University of Minnesota, ⁵University of Minnesota

8:15 a.m. PSI-7 **Hourly flushing rates and temperature trends for electronically controlled grouped floor cooling pads trends during the summer heat stress in a boar stud**

Daphne Licuan ¹, Kara R. Stewart ², Jamie Hundley ³, RJ Nepomuceno ⁴, Matt Robins ⁴, Randolph Crasto ⁴, Bradley A. Didion ⁵, Michael Kleve-Feld ⁶, Jung Y. Sung ⁷, Allan P. Schinckel ²

¹Purdue University Department of Animal Sciences, ²Purdue University, ³Pig Improvement Company Inc., ⁴Innovative Heating Technology, ⁵Genus plc, ⁶PIC North America, ⁷Department of Animal Sciences, Purdue University

8:15 a.m. PSI-8 **Impact of feeding level on boars from selection to entering the boar stud on trainability and growth measurements**

Taw Scaff ¹, Alicia N. Denton ¹, Ally ford ¹, Emma Zaicow ¹, Brian T. Richert ¹, Kara R. Stewart ¹

¹Purdue University

8:15 a.m. PSI-9 **Relationship of body condition measures and boar reproductive performance**

Timothy Safranski ¹, Caleb J. Grohmann ², Amanda Minton ³

¹University of Missouri, ²University of Missouri - Columbia, ³AcuFast Genetics

8:15 a.m. PSI-10 **Combination of probiotic *Bacillus licheniformis* and *Bacillus coagulans* in sow diets improves litter quality and piglet performance**

Patrícia Alvarenga ¹, Alexandra Schlagheck ², Lydia Zeibich ², Sarah Asmussen ³

¹Biochem Brasil Nutricao Animal Ltda, ²Biochem Zusatzstoffe Handels- und Produktionsges mbH, ³Livestock feed tests Denmark ApS

8:15 a.m. PSI-11 **Determination of standardized total tract phosphorus digestibility in expeller-pressed Canadian prairie grown soybean meal fed to growing pigs**

Shiven Patel ¹, Jinyoung Lee ¹, Neijat Mohamed ¹, Chengbo Yang ¹, James House ¹, Rob Patterson ², Martin Nyachoti ¹

¹University of Manitoba, ²CBS Bioplatforms

8:15 a.m. PSI-12 **Dietary isoacids modulate nutrient digestibility and fermentation products in ileal digesta and feces of growing pigs fed corn-soybean meal diets**

Angie P. Benavides Infante ¹, Jorge Y. Perez Palencia ¹, Crystal L. Levesque ², Lucas Rodrigues ³, Mike Socha ³, Wesley Schweer ³

¹South Dakota State University, ²South Dakota State University, ³Zinpro Corporation

8:15 a.m. PSI-13 **Digestible and metabolizable energy concentrations in soybean meal, fermented soybean meal, and soy protein concentrate fed to nursery pigs**

Yoon Soo Song ¹, Beob Gyun Kim ¹

¹Konkuk University

8:15 a.m. PSI-14 **Effect of dietary xylanase supplementation on growth performance, nutrient digestibility, and digesta viscosity of weaned pigs fed wheat-soybean meal-based diets**

Sydney Sheffield ¹, Keith D. Haydon ², Crystal L. Levesque ³, Jorge Y. Perez Palencia ¹
¹South Dakota State University, ²CJ Bio America, ³South Dakota State University

8:15 a.m. PSI-15 **Effect of feeding intact protein from soybean meal instead of crystalline amino acids on energy and nitrogen balance by growing pigs**

Minoy A. Cristobal ¹, Su A Lee ², Leidy J. Torres-Mendoza ³, Andrea P. Mallea ², Carl M. M. Parsons ³, Hans H. Stein ²
¹University of Illinois, ²University of Illinois at Urbana-Champaign, ³University of Illinois at Urbana Champaign

8:15 a.m. PSI-16 **Effect of HiPhorius phytase on finishing pig growth performance and bone mineralization with the use of two diet formulation strategies**

Julian Arroyave Jaramillo ¹, Macie E. Reeb ¹, Jason C. Woodworth ¹, Joel M. DeRouchey ¹, Mike D. Tokach ¹, Robert D. Goodband ¹, Jordan T. Gebhardt ¹, Jon R. Bergstrom ²
¹Kansas State University, ²DSM-Firmenich

8:15 a.m. PSI-17 **Effect of timing of high dietary zinc supplementation on the microbiome of gestating sows and their piglets**

Kelsey L. Hammers ¹, Pedro E. Urriola ², Mark Schwartz ³, Moon-Suhn Ryu ⁴, Andres Gomez ¹, Noor Huma ¹, Lee J. Johnston ¹
¹University of Minnesota, ²University of Minnesota, ³Schwartz Farms, ⁴Yonsei University

8:15 a.m. PSI-18 **Effects of heat treatment and multi-carbohydrase supplementation on the digestibility of phosphorus in field peas fed to growing pigs**

Jinyoung Lee ¹, Rob Patterson ², Martin Nyachoti ¹
¹University of Manitoba, ²CBS Bioplatforms

8:15 a.m. PSI-19 **Growth performance of weaned pigs fed Jerusalem Artichoke tubers**

Natalie A. Erker ¹, Talia K. Everding ¹, Alison C. Neujahr ², Duncan B. Paczosa ¹, Phillip S. Miller ¹, Thomas E. Burkey ¹
¹University of Nebraska-Lincoln; Department of Animal Science, ²University of Nebraska-Lincoln; Department of Complex Biosystems

8:15 a.m. PSI-20 **Isobutyrate supplementation improved energy and nitrogen digestibility in prepubertal gilts fed a high insoluble, but not soluble, fiber diet**

Wesley P. Schweer ¹, Lucas Rodrigues ¹, Alyssa S. Cornelison ¹, Mike Socha ¹, Brian J. Kerr ²
¹Zinpro Corporation, ²USDA

8:15 a.m. PSI-21 **Optimizing sample size for accurate measurements and prediction equations for intestinal morphology in broiler chickens**

Emmanuel O. Alagbe ¹, Jung Y. Sung ¹, Kylee Lindsey ², Jonathan A. Pasternak ¹, Olayiwola Adeola ¹
¹Department of Animal Sciences, Purdue University, ²Michigan State University

Poster Session II
10:00 AM - 10:45 AM
Grand Terrace

10:00 a.m. PSII-1 **Bacillus-based probiotic supplementation to sows and weaned progeny help to support live performance and manage gross lung lesions in a nursery H1N2 Influenza challenge**

Keith P. Kinsley¹, Adam Mueller², Mark J. Bertram³, Lea Hubertz B. Hansen⁴, Steve P. Lerner¹
¹Chr-Hansen Inc., ²Swine Services Unlimited Inc., ³First Choice Livestock, ⁴Chr Hansen A/S

10:00 a.m. PSII-2 **Effect of piglet processing and castration on growth performance in feeder pigs**

Emily R. Church¹, Benjamin Carpenter¹, Grady A. Privett¹, Amanda Holder¹
¹College of the Ozarks

10:00 a.m. PSII-3 **Evaluation of a microneedle patch for the delivery of meloxicam in a veterinary application**

Kirsten A. Midkiff¹, Katherine Miranda-Muñoz², Robin A. Cheek³, Jana L. Reynolds², Tsungcheng Cheng Tsai², Misty Bear⁴, Kushan Pamoda Kompale Kompalage⁴, Ryan Tucker⁴, Hans F. Coetzee⁴, Beth B. Kegley², Jorge Almodovar², Jeremy G. Powell²
¹University of Arkansas System Division of Agriculture, ²University of Arkansas, ³University of Arkansas, ⁴Kansas State College of Veterinary Medicine

10:00 a.m. PSII-4 **Temperature preference of nursery pigs housed in groups by weaning weight quartile**

Jenny Morris¹, Mike Ellis¹, Caleb M. Shull²
¹University of Illinois, ²The Maschoffs, LLC

10:00 a.m. PSII-5 **Temperature preference of nursery pigs housed in groups with mixed body weight**

Jenny Morris¹, Mike Ellis¹, Caleb M. Shull²
¹University of Illinois, ²The Maschoffs, LLC

10:00 a.m. PSII-6 **The interactive effects of deoxynivalenol and lipopolysaccharides on gut integrity and inflammation in IPEC-J2 cells**

Hang Lu¹, Julie Simmons¹, Adrienne Woodward¹, Nathan Horn¹
¹United Animal Health

10:00 a.m. PSII-7 **Effect of endophyte-infected tall fescue on body weight, vital signs, and liver function of beef heifers**

JOAO VITOR G. Takashe¹, Ahmed Sallem², Jackson Matthews³, Daniel W. W. Shike³, Camila U. Braz³
¹University of Illinois, ²University of Illinois Urbana-Champaign, ³University of Illinois Urbana-Champaign

10:00 a.m. PSII-8 **Analysis of maternal influence on Phenotypic Ultrasound Measurements of weaned Angus calves**

Sarah L. Phelps¹, Garland Dahlke¹, Mary E. Reynolds¹, Miranda Culbertson²
¹Iowa State University, ²Genus PIC

10:00 a.m. PSII-9 **Whole genome sequences of two nitrate-reducing strains of *Selenomonas ruminantium* isolated from the rumen**

Margaret K. Costello¹, Steven C. ricke¹, Jennifer McClure², Robin C. Anderson²
¹UW - Madison, ²USDA-ARS

10:00 a.m. PSII-10 **Development of an interdisciplinary undergraduate and graduate course in precision livestock farming systems**

Suzanne M. Leonard¹
¹North Carolina State University

10:00 a.m. PSII-11 **Achieving heavier piglet weights at weaning with live yeast (*Saccharomyces cerevisiae*) supplementation under field conditions**

Sophie Hiscocks¹, Gustavo Cordero¹, Laura A. Merriman¹, Pete Wilcock¹, Samuel F. Leiva², David S. Rosero³
¹AB Vista, ²The Hanor Company, Inc., ³Iowa State University

10:00 a.m. PSII-12 **Dose-dependent effects of supplemental benzoic acid on nitrogen balance, urinary pH, slurry pH, and manure odorous compounds in pigs**

Seung Bin Yoo¹, Yoon Soo Song¹, Siyoung Seo², Beob Gyun Kim¹
¹Konkuk University, ²National Institute of Animal Science

10:00 a.m. PSII-13 **Effects of benzoic acid, bromelain, adipic acid, and humic substance supplementation on nitrogen balance, urine pH, slurry pH, and manure odorous compounds in pigs**

Seung Bin Yoo¹, Yoon Soo Song¹, Siyoung Seo², Beob Gyun Kim¹
¹Konkuk University, ²National Institute of Animal Science

10:00 a.m. PSII-14 **Economic impact of adding exogenous enzymes in a sorghum-based diet for growing and finishing pigs**

Sibely Flores¹, Roberta Santos¹, Sudario Roberto Silva Junior², Pedro Henrique Pereira¹, Ygor H. Paula¹, Caio Pereira¹, VINICIUS S. CANTARELLI³, Rhuan F. Chaves⁴, Claudia Martins⁵, Vitor Fascina⁵, Leandro Alebrante⁵
¹Universidade Federal de Lavras, ²University of Minnesota, ³AnimalNutri, ⁴AnimalNutri - Science and Technology, ⁵DSM Nutritional Products Brazil SA

10:00 a.m. PSII-15 **Effect of 25-hydroxyvitamin D₃ supplementation on growth performance of nursery pigs**

Eva Safaie¹, Chan Ho Kwon¹, Savannah Locke¹, Jannell Torres¹, Setareh Khani¹, Sarah Han¹, Young Dal Jang¹
¹University of Georgia

10:00 a.m. PSII-16 **Effect of iron injection levels and second iron injection on preweaning growth performance and hematological parameters**

Eva Safaie ¹, Savannah Locke ¹, Sarah Han ¹, Jannell Torres ¹, Setareh Khani ¹, Young Dal Jang ¹
¹University of Georgia

10:00 a.m. PSII-17 **Effect of protease supplementation on amino acids digestibility of soybean meal fed to growing pigs of different ages**

Gabriela M. Miotto Galli ¹, Angie P. Benavides Infante ², Crystal L. Levesque ³, VINICIUS S. CANTARELLI ⁴, Rhuan F. Chaves ⁵, Claudia C. Silva ⁶, Vitor B. Fascina ⁶, Jorge Y. Perez Palencia ²

¹Universidade Federal do Rio Grande do sul, ²South Dakota State University, ³South Dakota State University, ⁴AnimalNutri, ⁵AnimalNutri - Science and Technology, ⁶dsm-firmenich

10:00 a.m. PSII-18 **Evaluating the effects of sodium diformate on finishing pig growth performance**

Katelyn Gaffield ¹, Joel M. DeRouchey ¹, Mike D. Tokach ¹, Jason C. Woodworth ¹, Robert D. Goodband ¹, Mariana Menegat ², Mary Liebenstein ², Matt W. Allerson ², Jordan T. Gebhardt ¹

¹Kansas State University, ²Holden Farms

10:00 a.m. PSII-19 **Fecal microbiota composition of weaned piglets under mixed management and poor housing conditions fed diets increased in threonine, methionine and tryptophan**

Danilo Alves Marçal ¹, Antonio Diego Brandão Brandao Melo ², Joseane Penteado Rosa Gonçalves ³, Qinnan Yang ⁴, Marllon José Karpeggiane de Oliveira ⁵, Pedro Righetti Arnaut ⁶, Manoela Trevizan Ortiz ³, Ismael França ⁵, Graziela Alves da Cunha Valini ⁵, Nate Korth ⁷, Natasha Pavlovikj ⁴, Paulo Henrique Reis Furtado Campo ⁸, Henrique Gastmann Brand ⁹, John K. Htoo ¹⁰, João Carlos Gomes-Neto ⁷, Andrew Benson ⁴, Luciano Hauschild ⁵

¹São Paulo State University (UNESP), ²Department of Animal Science, School of Agricultural and Veterinarian Sciences, Universidade Estadual Paulista (Unesp), São Paulo, Jaboticabal, Brazil, 14884-900. Department of Food Science and Technology, University of Nebraska, Lincoln, NE, USA., ³São Paulo State University, ⁴University of Nebraska-Lincoln, ⁵Department of Animal Science, School of Agricultural and Veterinarian Sciences, Universidade Estadual Paulista (Unesp), São Paulo, Jaboticabal, Brazil, 14884-900., ⁶AGRIFOOD/UNESP, ⁷Department of Food Science and Technology, University of Nebraska, Lincoln, NE, USA. Nebraska Food for Health Center, University of Nebraska, Lincoln, NE, USA., ⁸Federal University of Viçosa, ⁹Evonik, ¹⁰Evonik Operations GmbH

¹Furst-McNess Company

10:00 a.m. PSII-20 **Feeding behavior of pigs fed dietary amino acid levels adjusted according to the circadian rhythm**

Alini Mari Veira ¹, Luan Sousa Dos Santos ², Danilo Alves Marçal ³, Antonio Diego Brandão Brandao Melo ⁴, Luciano Hauschild ³

¹São Paulo State University, ²Federal University of Mato Grosso do Sul, ³Department of Animal Science, School of Agricultural and Veterinarian Sciences, Universidade Estadual Paulista (Unesp), São Paulo, Jaboticabal, Brazil, 14884-900., ⁴Department of Animal Science, School of Agricultural and Veterinarian Sciences, Universidade Estadual Paulista (Unesp), São Paulo, Jaboticabal, Brazil, 14884-900. Department of Food Science and Technology, University of Nebraska, Lincoln, NE, USA.

10:00 a.m. PSII-21 **Feed intake and growth of young turkeys in the brood when supplemented with Viribus Essentials, a blend of botanical extracts and natural flavors**

Fredrik Sandberg ¹, Steve J. England ¹, Woong Bi Kwon ¹, Robert Fischer ¹

Poster Session III

4:45 PM - 5:30 PM

Grand Terrace

4:45 p.m. PSIII-1 **Clinical benefits of an in-water essential oil blend on antibiotic-free pigs with post-weaning diarrhea: A field study**

Gillian GREAVES ¹, Clint LICHTY ¹, Ashley L. WAGNER ², Bertrand MEDINA ², Ivan D. GIRARD ²
¹SouthWest Ontario Veterinary Service, ²Probiotech International Inc.

4:45 p.m. PSIII-2 **Evaluation of medium-chain fatty acids on just-weaned piglet performance and diarrhoea scores: A nursery trial**

Bertrand MEDINA ¹, Dan BUSSIÈRES ², Ivan D. GIRARD ¹
¹Probiotech International Inc., ²Groupe CÉRÈS Inc.

4:45 p.m. PSIII-3 **Evaluation of remote detection of heart rate, respiratory rate, and body temperature for improved detection of bovine respiratory disease in high-risk receiving calves**

Robin A. Cheek ¹, Beth B. Kegley ², Jana L. Reynolds ², Scott Ijaz ², Kirsten A. Midkiff ³, Jeremy G. Powell ²

¹University of Arkansas, ²University of Arkansas, ³University of Arkansas System Division of Agriculture

4:45 p.m. PSIII-4 **Evaluating the variability of the dual sugar absorption test as a measure of intestinal permeability in pigs**

Cameron S. White ¹, Laura L. Greiner ², Mike D. Tokach ³, Jason C. Woodworth ³, Ryan N. Dilger ⁴

¹University of Illinois Urbana-Champaign, ²Iowa State University, ³Kansas State University,

⁴University of Illinois at Urbana-Champaign

4:45 p.m. PSIII-5 **Impact of multiple suckling of litters during lactation on pre-weaning piglet performance**

Noah Gainey ¹, Caleb M. Shull ², Mike Ellis ³

¹University of Illinois, Urbana-Champaign, ²The Maschhoffs, LLC, ³University of Illinois

4:45 p.m. PSIII-6 **Tail damage caused by tail biting in growing-finishing pigs housed in two group sizes**

Yuzhi Li ¹, Courtney Archer ¹, Adrienne Hilbrands ¹, Ty B. Schmidt ², Benny E. Mote ², Lee J. Johnston ¹

¹University of Minnesota, ²University of Nebraska – Lincoln

4:45 p.m. PSIII-7 **7&7 Synch improved pregnancy rates in beef cows experiencing estrus over 24 h before fixed-time insemination**

Garrett Havelka ¹, Friederike Baumgaertner ¹, Kerri A. Bochantin ¹, Jennifer L. Hurlbert ², Timothy Long ¹, Cody Wieland ¹, Kevin K. Sedivec ¹, Carl R. Dahlen ²

¹North Dakota State University, ²Department of Animal Sciences, Center for Nutrition and Pregnancy, North Dakota State University

4:45 p.m. PSIII-8 **Expression of Toll-Like Receptors in endometrium of gilts during early gestation**

Kyle J. Hickman-Brown ¹, Molly S. Smith ¹, Brooke E. McAnally ¹, Joe Cain ¹, Heewon Seo ¹, Claire Stenhouse ², Fuller W. Bazer ¹, Greg Johnson ¹, Jeffrey Wiegert ¹, Rebecca K. Poole ¹

¹Texas A&M University, ²Pennsylvania State University

4:45 p.m. PSIII-9 **Field fertility following the practice of post-cervical artificial insemination (PCAI) at multiple North American swine units.**

Bradley A. Didion ¹, Michael Kleve-Feld ²

¹Genus plc, ²PIC North America

4:45 p.m. PSIII-10 **Impact of late gestation vitamin A and D injection on offspring growth and immune parameters in piglets**

Samantha Yankocyt ¹, Laura Loughlin ¹, Rachel Walker ¹, Elizabeth A. Hines ¹

¹Penn State University

4:45 p.m. PSIII-11 **Impacts of late gestational in utero heat stress on small intestine dynamics of neonatal dairy calves**

Maverick C. Guenther ¹, Brittney D. Davidson ¹, Sena Field ¹, Bethany Dado-Senn ¹, Geoffrey Dahl ², Michael A. Steele ³, Lautaro Cangiano ¹, Jimena Laporta ¹

¹University of Wisconsin- Madison, ²University of Florida, ³University of Guelph

4:45 p.m. PSIII-12 **Influence of early gestational heat stress on biomarkers of mammary gland development in replacement gilts genomically selected for thermotolerance or thermosensitivity**

Jacob Musa ¹, MaryKate Byrd ¹, Theresa M. Casey ², Luiz F. F. Brito ¹, Aridany Suarez-Trujillo ³, Allan P. Schinckel ¹, Christian Maltecca ⁴, Francesco Tiezzi ⁵, Jay S. Johnson ⁶

¹Purdue University, ²Department of Animal Sciences, Purdue University, ³Berry College, ⁴North Carolina State University, ⁵University of Florence, ⁶USDA-ARS Livestock Behavior Research Unit

4:45 p.m. PSIII-13 **Putative metabolites for sow lifetime opportunity and production traits**

Lea A. Rempel ¹, Robert Lee ¹

¹USDA, ARS, USMARC

4:45 p.m. PSIII-14 **Effect of a combined supplementation of *Bacillus* spp. and lactic acid bacteria probiotics on growth performance and fecal score in nursery pigs**

Tiffany Petersen¹, Chan Ho Kwon², Young Dal Jang²

¹University of Wisconsin - River Falls, ²University of Georgia

4:45 p.m. PSIII-15 **Effect of dietary fatty acids composition on growth performance, fecal consistency, and plasma fatty acid profile of weaned pigs**

Alejandra Forero Salamanca¹, Crystal L. Levesque², Jorge Y. Perez Palencia¹

¹South Dakota State University, ²South Dakota State University

4:45 p.m. PSIII-16 **Effects of dietary corn origin (U.S., Argentina, and Brazil) on pig growth performance**

Joseph Halbur¹, Alejandra Forero Salamanca¹, Jordan K. Jansen¹, Jinsu Hong¹, Jorge Y. Perez Palencia¹, Crystal L. Levesque², Shane Mueller³, Robert C. Thaler¹, Eric Weaver¹

¹South Dakota State University, ²South Dakota State University, ³Northern Crops Institute

4:45 p.m. PSIII-17 **Comparative assessment of New Generation Phytase (HiPhorius™ vs. Ronozyme HiPhos in growing-finishing pigs**

Aileen Joy L. Mercado¹, Terry Weeden¹, Huyen T. Tran¹, Murali Raghavendra Rao², Jon R. Bergstrom³, Brenda de Rodas¹

¹Purina Animal Nutrition, ²Purina Animal Nutrition LLC, ³dsm-firmenich

4:45 p.m. PSIII-18 **Effects of HiPhorius and Ronozyme HiPhos on performance of nursery pigs**

Huyen T. Tran¹, Aileen Joy L. Mercado¹, Terry Weeden¹, Jon R. Bergstrom², Brenda de Rodas¹

¹Purina Animal Nutrition, ²dsm-firmenich

4:45 p.m. PSIII-19 **Impact of EnduraPig™ and EnduraSow™ supplementation on growth performance of wean to finish pigs naturally infected with porcine reproductive and respiratory syndrome virus**

Aileen Joy L. Mercado¹, Huyen T. Tran¹, Stacie Crowder², Brenda de Rodas¹

¹Purina Animal Nutrition, ²PMI Additives

4:45 p.m. PSIII-20 **Impact of EnduraPig™ on Performance of PRRSV-Negative growing-finishing pigs**

Huyen T. Tran¹, Aileen Joy L. Mercado¹, Murali Raghavendra Rao², Stacie Crowder³, Brenda de Rodas¹

¹Purina Animal Nutrition, ²Purina Animal Nutrition LLC, ³PMI Additives

4:45 p.m. PSIII-21 **Impact of high zinc oxide supplementation or lignocellulose supplement on chronic markers of intestinal inflammation and growth of weaned piglets**

Eya Selmi¹, Antony Vincent¹, Marie-Pierre Létourneau-Montminy¹, Luca Lo Verso¹, Frédéric Guay¹

¹Laval University

Tuesday, March 12, 2024

**Poster Session IV-A
(Undergraduate Student Poster Competition)**

7:30 AM - 8:30 AM
Grand Terrace

7:30 a.m. PSIV-A-1 **Comparing early and late spring grazing of cereal rye utilizing a high-density, short-duration grazing system**

Rachel Stone¹, Joshua C. McCann², Keela Trennepohl¹

¹Western Illinois University, ²University of Illinois Urbana-Champaign

7:30 a.m. PSIV-A-2 **Comparison of rising plate meter and total collection methods for forage mass determination of tall fescue**

Fernando Delgado¹, Kylie P. Ewing¹, Joshua C. McCann², Daniel W. W. Shike²

¹University of Illinois, ²University of Illinois Urbana-Champaign

7:30 a.m. PSIV-A-3 **Effect of fiber and stmbiotic on growth performance and the gut microbiome in pigs challenged with F18 enterotoxigenic *Escherichia coli* (ETEC).**

Erika Shirer¹, Alisun N. Watson¹, Robert Story¹, Charles V. V. Maxwell¹, Spenser Becker², Pete Wilcock², Amanda J. Gerhart³, Jiangchao Zhao¹, Tsungcheng Cheng Tsai¹

¹University of Arkansas, ²AB Vista, ³JBS S.A.

7:30 a.m. PSIV-A-4 **Effect of late gestational nutrient restriction on locomotor activity of beef heifers**

Mattie T. DeHaven¹, Colby A. Redifer¹, Abigail R. Rathert-Williams¹, Allison M. Meyer¹

¹Division of Animal Sciences, University of Missouri

7:30 a.m. PSIV-A-5 **Effect of roughage inclusion in limit-fed cow rations on behavior, cow hygiene, and manure scores**

Meg Fowler¹, Brayden Freeman¹, Kylie P. Ewing¹, W. Travis T. Meteer¹, Wesley P. Chapple¹, Joshua C. McCann², Daniel W. W. Shike²

¹University of Illinois, ²University of Illinois Urbana-Champaign

7:30 a.m. PSIV-A-6 **Effects of a yeast cell wall additive on the growth performance and fecal *Eimeria* load of finishing lambs**

Kristen Kahler¹, Payton L. Dahmer²

¹Kansas State University, ²Kansas State University Department of Animal Sciences & Industry

7:30 a.m. PSIV-A-7 **Effects of late gestational nutrient restriction of beef heifers on small intestinal crypt depth in neonatal calves**

Samuel G. Bradshaw¹, Abigail R. Rathert-Williams¹, Colby A. Redifer¹, Allison M. Meyer¹

¹Division of Animal Sciences, University of Missouri

7:30 a.m. PSIV-A-8 **Effects of meal frequency on heart rate in horses**

Alora V. Brown¹, Elizabeth R. Share¹, Nettie Liburt², Jessica K. Suagee Bedore³, Patricia Harris⁴, Sara L. Mastellar⁵

¹The Ohio State University Department of Animal Sciences, ²Mars Petcare, ³Virginia Tech School of Animal Sciences, ⁴Waltham Petcare Science Institute, ⁵Ohio State University Agricultural Technical Institute

7:30 a.m. PSIV-A-9 **Effects of non-nutritive sweeteners on growth performance and diarrhea of weaned pigs**

Mariah Jansen¹, Veronica I. Polniak¹, Andrea M. Luttman¹, Riley Barber¹, Delani Stull¹, Dale W. Rozeboom¹, Kwangwook Kim²

¹Michigan State University, ²Michigan State university

7:30 a.m. PSIV-A-10 **Pilot study: acute changes in mare milk composition in response to concentrate feeding**

Carlee Oberlin¹, Savea Zimmerman-Cameron¹, Morgan Pyles¹

¹University of Minnesota Crookston

7:30 a.m. PSIV-A-11 **Potential of black soldier fly (*Hermetia illucens*) larvae frass as a functional ingredient for nursery pigs**

Sarah Rubio¹, Izadora Batista Kuneff², Fernando Soler², Charmaine Espinosa³, Liz Koutsos³, Eric van Heugten²

¹Zamorano Pan-American Agricultural School and Department of Animal Science, North Carolina State University, ²Department of Animal Science, North Carolina State University, ³EnviroFlight LLC

7:30 a.m. PSIV-A-12 **Ruminal in vitro digestibility of novel pennycress meal using the Daisy II incubator**

Alyssa Brown¹, Emma G. Prybylski¹, Lauren Neuleib², Joshua C. McCann³, Nicholas Heller², Jennifer E. Earing²

¹University of Illinois Champaign-Urbana, ²Illinois State University, ³University of Illinois Urbana-Champaign

7:30 a.m. PSIV-A-13 **The relationship between breed-wide expected progeny differences, genomic predictors, and phenotypic values in mature Angus cows**

Jacy Riddle¹, Amanda Holder¹

¹College of the Ozarks

Poster Session IV

7:45 AM - 8:30 AM

Grand Terrace

7:45 a.m. PSIV-14 **Assessing sow and suckling pig hemoglobin status in a single lactation following one or two iron supplementations of piglets in a commercial farm**

Aryeri S. Bardales¹, Casey L. Bradley², Crystal L. Levesque³

¹South Dakota State University, ²Sunswine Group, ³South Dakota State University

7:45 a.m. PSIV-15 **Effects of dietary supplementation of carbohydrase on growth performance and health status of growing-finishing pigs**

Woong Bi Kwon¹, Steve J. England¹, Greg Hartsook¹, Pornpim Aparachita¹, Kevin Soltwedel¹, Robert Fischer¹, Fredrik Sandberg¹

¹Furst-McNess Company

7:45 a.m. PSIV-16 **Evaluation of specialty soybean products and organic acids to alter nursery diet acid-binding capacity-4 on pig performance and fecal dry matter**

Ethan Stas¹, Mike D. Tokach¹, Jason C. Woodworth¹, Joel M. DeRouchey¹, Robert D. Goodband¹, Jordan T. Gebhardt¹

¹Kansas State University

7:45 a.m. PSIV-17 **Effects of butyric-based additive supplementation on nursery pig performance, fecal dry matter, serum cytokines, short chain fatty acid production, and serum chemistry**

Ethan Stas¹, Jason C. Woodworth¹, Mike D. Tokach¹, Joel M. DeRouchey¹, Robert D. Goodband¹, Jordan T. Gebhardt¹

¹Kansas State University

7:45 a.m. PSIV-18 **Evaluation of lactose level and whey permeate form on nursery pig performance**

Ethan Stas¹, Jason Frank², Tingting Wang², Joel M. DeRouchey¹, Mike D. Tokach¹, Jason C. Woodworth¹, Robert D. Goodband¹, Jordan T. Gebhardt¹

¹Kansas State University, ²International Ingredients Corporation

7:45 a.m. PSIV-19 **Effects of Flavolac feed top dress in lactation on sow body weight change and litter performance**

Rafe Q. Royall¹, Karley Stephens², Mike D. Tokach¹, Jason C. Woodworth¹, Joel M. DeRouchey¹, Jordan T. Gebhardt¹, Analia Ribeiro da Silva³, Kyle Coble⁴, Jimmy Karl⁴, Paul Corns⁴, Tag Bradley⁴

¹Kansas State University, ²Texas Tech University, ³Agrocerees Multimix, ⁴JBS Live Pork

7:45 a.m. PSIV-20 **Evaluation of pectinase on nursery pig performance**

Mitchell J. Nisley¹, Nicholas K. Gabler¹, Erik Vanderbeke², David Nolan²

¹Iowa State University, ²Huvepharma

7:45 a.m. PSIV-21 **Ileal digestibility of amino acids in feed ingredients for 22-, 56-, and 87-kilogram pigs**

Jung Y. Sung¹, Sun Jong Yoo¹, Beob Gyun Kim¹

¹Konkuk University

Poster Session V
11:45 AM - 12:30 PM
Grand Terrace

11:45 a.m. PSV-1 **A comparison of Holstein-cross cattle and beef-cross cattle in terms of performance and carcass quality**

Deedra M. Winebold¹, Rebecca L. Tollefson¹, Claire Deaton¹, Adam King¹, Riley Case¹, Joel Robertson¹, Emily Church¹, Amanda Holder¹

¹College of the Ozarks

11:45 a.m. PSV-2 **Digestible indispensable amino acid scores (DIAAS) in pork products**

Juliana Carolina Florencio Ravagnani Martins¹, Natalia Dos Santos Fanelli¹, Hans H. Stein²

¹University of Illinois, ²University of Illinois at Urbana-Champaign

11:45 a.m. PSV-3 **Effects of maternal early gestational weight gain on multigenerational skeletal muscle gene regulation in offspring**

German D. Ramirez-Zamudio¹, Carl R. Dahlen², Friederike Baumgaertner³, Ana Clara B. Menezes², Jennifer L. Hurlbert², Kerri A. Bochantin³, Sarah R. Underdahl³, Kacie L. McCarthy², Lawrence P. P. Reynolds³, Alison Ward², Pawel P. P. Borowicz³, Kevin K. Sedivec³, Joel S. Caton², Wellison J. S. Diniz⁴

¹Department of Animal Sciences / North Dakota State University, ²Department of Animal Sciences, Center for Nutrition and Pregnancy, North Dakota State University, ³North Dakota State University, ⁴Department of Animal Sciences, Auburn University

11:45 a.m. PSV-4 **Exposure to prenatal tributyrin improved pre-weaning growth performance and reduced fat deposition in the muscle of market age pigs**

Elizabeth Cooper¹, Robert Murray², Rousset Palou¹, Grace I. Markley¹, Chad H. Stahl¹

¹University of Maryland, College Park, ²University of Maryland

11:45 a.m. PSV-5 **Influence of an oregano-based essential oil on growth performance and carcass traits of beef steers**

Bergin M. DeBruin¹, Christina Bakker¹, Zachary K. Smith¹, Keith Underwood¹, Judson K. Grubbs¹, Amanda Blair¹, Warren C. Rusche¹

¹South Dakota State University

11:45 a.m. PSV-6 **The additive effect of hormonal implant and inclusion of beta-agonists in carcass quality in beef cattle**

Rebecca Tollefson¹, Deedra M. Winebold¹, Claire Deaton¹, Adam King¹, Riley Case¹, Joel Robertson¹, Emily Church¹, Amanda Holder¹

¹College of the Ozarks

11:45 a.m. PSV-7 **greatOPlus (extruded blend of flaxseed and *Nannochloropsis oculata* biomass) Improves Finishing Cattle Performance and Carcass Characteristics**

Firman Nasiu¹, Luis FBB Feitoza¹, Adrian N. Baker¹, Ross L. Thorn¹, Ludmila S. Monteiro¹, James S. Drouillard¹

¹Kansas State University

11:45 a.m. PSV-8 **Development of genetically engineered microbes as probiotics to enhance ruminant productivity**

Tien Doan¹, Alison C. Neujahr², Samodha C. Fernando¹

¹University of Nebraska-Lincoln, ²University of Nebraska-Lincoln; Department of Complex Biosystems

11:45 a.m. PSV-9 **Effects of increasing amounts of high-oleic or conventional soybeans in diets fed to mid-lactation dairy cows on measures of dry matter intake and lactation**

Tiffany Hagemann¹, Emily A. Petzel¹, Eric Bailey¹, Derek W. Brake¹

¹University of Missouri

11:45 a.m. PSV-10 **Evaluation of the effect of probiotic feed additives in the diet to improve dairy production and quality measures**

Riley Case¹, Amanda Holder¹, Ryan Bilyeu¹

¹College of the Ozarks

11:45 a.m. PSV-11 **In vitro screening of selected compounds to reduce ruminal methane production**

Alice H. Peres Assumpcao¹, Hilario C. Mantovani², Xia Zhu-Barker³

¹UW-Madison, ²UW Madison, ³UW-Madison

11:45 a.m. PSV-12 **Microbial community structure of dairy cattle is stable through oscillating crude protein inclusion**

Fiorella L. Viquez-Umana¹, Mary Grace Erickson², Geoffrey Zanton², Michel Wattiaux², Garret Suen², Hilario C. Mantovani²

¹UW madison, ²UW Madison

11:45 a.m. PSV-13 **The influence of diet type on beef cattle performance and meat quality characteristics**

Claire Deaton¹, Rebecca L. Tollefson¹, Adam King¹, Riley Case¹, Joel Robertson¹, Emily Church¹, Amanda Holder¹

¹College of the Ozarks

11:45 a.m. PSV-14 **Determination of optimal digestible phosphorus level in lactating sows**

Qiong Hu¹, Junmei Zhao¹, Stephanie Walston¹

¹Cargill

11:45 a.m. PSV-15 **Effect of functional amino acids and fiber on growth performance of post-weaning pigs**

Caroline Gonzalez Vega¹, Stephanie Walston¹, Sabrina May¹, Qiong Hu¹, Richard Faris¹

¹Cargill

11:45 a.m. PSV-16 **Effect of precision feeding and functional amino acids on immune response and protein metabolism of growing pigs raised in poor sanitary conditions**

Pedro Righetti Arnaut¹, Aline Remus², Candido Pomar², Luciano Hauschild³

¹AGRIFOOD/UNESP, ²Agriculture and Agri-Food Canada (AAFC), ³Department of Animal Science, School of Agricultural and Veterinarian Sciences, Universidade Estadual Paulista (Unesp), São Paulo, Jaboticabal, Brazil, 14884-900.

11:45 a.m. PSV-17 **Glycerol monolaurate improves litter performance and modifies milk composition when fed to lactating sows**

Chad Risley ¹, Johnny Lopez ¹, Christian Cordts ², Fiona von Brandestein ²

¹Berg+Schmidt America, LLC, ²Berg+Schmidt GmbH & Co KG

11:45 a.m. PSV-18 **Improved performance of PRRSV challenged pigs fed 1- α -glycerol monolaurate**

Chad Risley ¹, Johnny Lopez ¹, Christian Cordts ²

¹Berg+Schmidt America, LLC, ²Berg+Schmidt GmbH & Co KG

11:45 a.m. PSV-19 **Impact of precision feeding and bump feeding strategy during gestation on the performance of post-weaning pigs**

Carole Pierre ¹, Laetitia Cloutier ², Lucie Galiot ², Frédéric Guay ¹

¹Laval University, ²Centre de développement du porc du Québec

11:45 a.m. PSV-20 **Mycotoxin contamination trends in United States corn grain: 2019-2023**

Paige N. Gott ¹, Lan Zheng ¹, Shelby Corray ¹, Chasity Pender ¹, Sara Hough ², April Levy ¹

¹dsm-firmenich, ²dsm-firmenich, Animal Nutrition & Health

11:45 a.m. PSV-21 **Pediococcus acidilactici survives an in vitro simulated digestion**

Rebecca Brown ¹, Rui Zheng ², Sheila K. Jacobi ¹

¹The Ohio State University, ²Ohio State University

Poster Session VI

12:45 PM - 1:30 PM

Grand Terrace

12:45 p.m. PSVI-1 **Backgrounding and finishing systems for cattle fed corn silages and corn grains differing in amylase expression**

Ludmila de Souza Monteiro ¹, James S. Drouillard ¹

¹Kansas State University

12:45 p.m. PSVI-2 **Economic evaluation of forage-fed vs concentrate-fed beef finishing systems**

Joel Robertson ¹, Rebecca L. Tollefson ¹, Deedra M. Winebold ¹, Claire Deaton ¹, Adam King ¹,

Riley Case ¹, Emily Church ¹, Amanda Holder ¹

¹College of the Ozarks

12:45 p.m. PSVI-3 **Effects of dried distillers grains on performance of suckling beef calves in a creep-feeding system**

Ellem Maria Maria De Almeida Matos ¹, Sebastião De Campos Valadares Filho ², Gabriel Santos Souza David ³, Nathalia Veloso Tropa ², Dhones Rodrigues de Andrade ², Julia Travassos da Silva ², Pauliane Pucetti ², Fernando Alerrandro Alerrandro Andrade Cidrini ², Luiz Carlos Oliveira de Sousa ², Joel S. Caton ⁴

¹Universidade Federal de Vicosa, ²Universidade Federal de Viçosa, ³Universidade Estadual Paulista, ⁴Department of Animal Sciences, Center for Nutrition and Pregnancy, North Dakota State University

12:45 p.m. PSVI-4 **Effects of ruminal acidosis on rumen fermentation of steers adapted to a high concentrate diet**

Haley F. Linder ¹, Larry L. Berger ¹, Joshua C. McCann ¹

¹University of Illinois Urbana-Champaign

12:45 p.m. PSVI-5 **Extruded blend of *Nannochloropsis oculata* microalgae and flaxseed and its effects on ruminal fermentation and nutrient digestion**

Ross L. Thorn ¹, James S. Drouillard ¹

¹Kansas State University

12:45 p.m. PSVI-6 **Metabolic potential of three novel rumen bacterial species from sheep characterized by utilizing a metagenomic-based approach**

Reid F. Anema ¹, Zachary K. Smith ¹, Benoit St-Pierre ¹

¹South Dakota State University

12:45 p.m. PSVI-7 **A traceable signature for a recovery microbiome composition after a dysbiosis caused by a sanitary challenge in pigs**

Antonio Diego Brandão Brandao Melo ¹, Graziela Alves da Cunha Valini ², João Carlos Gomes-Neto ³, Marllon José Karpeggiane de Oliveira ², Danilo Alves Marçal ², Pedro Righetti Arnaut ⁴, Ismael França ², Nate Korth ³, Natasha Pavlovikj ⁵, John K. Htoo ⁶, Henrique Gastmann Brand ⁷, Andrew K. Benson ³, Luciano Hauschild ²

¹Department of Animal Science, School of Agricultural and Veterinarian Sciences, Universidade Estadual Paulista (Unesp), São Paulo, Jaboticabal, Brazil, 14884-900. Department of Food Science and Technology, University of Nebraska, Lincoln, NE, USA., ²Department of Animal Science, School of Agricultural and Veterinarian Sciences, Universidade Estadual Paulista (Unesp), São Paulo, Jaboticabal, Brazil, 14884-900., ³Department of Food Science and Technology, University of Nebraska, Lincoln, NE, USA. Nebraska Food for Health Center, University of Nebraska, Lincoln, NE, USA., ⁴AGRIFOOD/UNESP, ⁵School of Computing, University of Nebraska-Lincoln, Lincoln, NE 68588, USA., ⁶Evonik Operations GmbH, ⁷Evonik

12:45 p.m. PSVI-8 **Effect of botanical extracts and calcium gluconate fed during lactation on sow and litter performance**

C. P. A. van de Ligt ¹, S. Nielsen ², N. S. Tillman ³, Emma H. Wall ⁴

¹Selko USA, ²Eagle Estates, ³Nutritional Statistics LLC, ⁴Nutreco

12:45 p.m. PSVI-9 **Effect of botanical extracts in diets with nutritional or pharmacological levels of copper and zinc on growth performance and fecal dry matter in nursery pigs**

Ty Kim ¹, Jason C. Woodworth ¹, Mike D. Tokach ¹, Joel M. DeRouchey ¹, Robert D. Goodband ¹, Jordan T. Gebhardt ¹, Chris P. A. Van de Ligt ², Emma H. Wall ³

¹Kansas State University, ²Selko, ³Nutreco

12:45 p.m. PSVI-10 **Effect of sulfate or hydroxychloride forms of zinc, manganese, and copper on growth performance, weight variation, and carcass characteristics of grow-finish pigs**

Hilario M. Cordoba ¹, Jason C. Woodworth ¹, Robert D. Goodband ¹, Joel M. DeRouchey ¹, Mike D. Tokach ¹, Jordan T. Gebhardt ¹, Chris P. A. Van de Ligt ²

¹Kansas State University, ²Selko

12:45 p.m. PSVI-11 **Effects of S-Abscisic Acid administration on the antioxidative status and glucose absorption in the gut of rats**

Izuru Shinzato ¹, Hiroshi Kojo ¹, Daisuke Matsui ¹, Tsuyoshi Tonoue ¹, Takamitsu Tsukahara ²

¹Sumitomo Chemical Co., Ltd., ²Kyoto Institute of Nutrition & Pathology, Inc.

12:45 p.m. PSVI-12 **Effects of sodium gluconate supplementation on growth performances of nursery piglets and growing pigs**

Daisuke Matsui ¹, Keiichiro Iwamae ², Tsuyoshi Tonoue ¹, Izuru Shinzato ¹

¹Sumitomo Chemical Co., Ltd., ²FUSO CORPORATION CO., LTD.

12:45 p.m. PSVI-13 **Formulated botanical preparation improves passive immunity from sows to piglets**

C. P. A. van de Ligt ¹, S. Ravichandran ², Emma H. Wall ³

¹Selko USA, ²AVT Natural North America, ³Nutreco

12:45 p.m. PSVI-14 **Changes in zinc oxide concentration in feed and effects of probiotic addition to weaning to finishing pig diet by microbiome analysis**

Sungbo Cho ¹, Kyejin Lee ¹, Sarbani Biswas ¹, In Ho Kim ¹

¹Dankook University

12:45 p.m. PSVI-15 **Assessing the implications of a silymarin-enriched diet on the performance and blood absorption rate of broiler and laying hen**

Kyejin Lee ¹, Sungbo Cho ¹, Sarbani Biswas ¹, In Ho Kim ¹

¹Dankook University

12:45 p.m. PSVI-16 **Inclusion of dietary micelle silymarin on production performance, egg quality, storage capacity, and blood profile Sin Hy-line brown laying hens**

Kyejin Lee ¹, Sungbo Cho ¹, Golam Sagir Ahammad ¹, In Ho Kim ¹

¹Dankook University

12:45 p.m. PSVI-17 **Inclusion of glutathione precursor to sows' diet from 114th of lactation through to weaning day 21 improves serum hormone levels and piglet performance**

Kyejin Lee ¹, Sungbo Cho ¹, Sumaya Tanzin Wahid ¹, In Ho Kim ¹

¹Dankook University

12:45 p.m. PSVI-18 **Low and high feed efficiency grower-finisher pigs fed three different levels of dietary crude protein showed no immediate difference in blood metabolomics profile**

Marleen Elise van der Heide ¹, Elham Assadi Soumeh ², Mihai Curtasu ¹, Jan Værum Nørgaard ¹, Johannes Gulmann Madsen ³

¹Aarhus University, ²University of Queensland, ³University of Copenhagen

12:45 p.m. PSVI-19 **No apparent association between the microbiome in the distal part of the small intestine and feed efficiency in grower-finisher pigs fed three different levels of dietary crude protein**

Marleen Elise van der Heide ¹, Nilay Büdeyri Gökgöz ², Dennis Sandris Nielsen ², Jan Værum Nørgaard ¹, Johannes Gulmann Madsen ²

¹Aarhus University, ²University of Copenhagen

12:45 p.m. PSVI-20 **The effect of a probiotic feed additive on average daily gain and feed intake**

Grady A. Privett ¹, Benjamin Carpenter ¹, Emily Church ¹, Amanda Holder ¹

¹College of the Ozarks

12:45 p.m. PSVI-21 **The effects of soybean meal concentration and *Yucca schidigera* extract supplementation on growth performance of nursery swine**

Jose A. Soto ¹, Henrique S. Cemin ², Morgan D. Hart ³, Sharlie A. Hansen ², Ernie L. Hansen ²

¹Alltech, ²Hubbard Feeds, ³Hubbard Feed