10th International Livestock Environment Symposium with 1st U.S. Precision Livestock Farming Symposium

Planning Committee

Thank you!

Morgan Hayes, Chair
Daniel Berckmans
Tami Brown-Brandl
Maria Cambra Lopez
Kenneth Casey
Christopher Choi
Richard S. Gates
Angela Green
Hong Li
Jacob Mayer
Brett Ramirez
Tim Shepherd
Mindy Spiehs
Richard Stowell
Hongwei Xin
Yang Zhao
10th International Livestock Environment Symposium
With
1st U.S. Precision Livestock Farming Symposium

DoubleTree by Hilton, Downtown Omaha, Nebraska

September 25-27, 2018

PROGRAM

Monday, September 24
2:00PM - 6:00PM  Registration
Location: Grand Ballroom East

Tuesday, September 25
7:00AM - 5:00PM  Registration
Location: Grand Ballroom East

8:30AM - 10:00AM  Opening Session
Moderator:  Tami Brown-Brandl, USDA-ARS-MARC, Clay Center, Nebraska
Location:  Grand Ballroom Center/West
8:30AM  Keynote Speaker:
Director Steve Wellman, Nebraska Department of Agriculture
“Nebraska Agriculture: Opportunities for Agriculture Engineering and Livestock Production”
9:00AM  ILES Founders:
Dr. James DeShazer, Professor Emeritus, University of Idaho, Retired P.E.
Dr. Leroy Hahn, U.S. Meat Animal Research Center, Retired P.E.
“ILES: Rational Environmental Management of Livestock-Foundation, Accomplishments and Future”

10:00AM - 10:30AM  Break
10:30AM - 12:00PM  Concurrent Sessions I, II, III, IV

I.  Animal Responses to Environment

SPACE, FLOORING AND BEDDING EFFECTS  
Moderator:  Curt Gooch, Cornell University, Ithaca, New York  
Location:  Missouri

10:30AM  ILES18-003  Sand Bedding for Dairy Cows: Benefits, Cubicles, and Manure Handling  
Andrew Wedel, P.E., (Presenting Author), McLanahan, Hollidaysburg, Pennsylvania (Andrew Wedel)

10:45AM  ILES18-103  Floor Cleanliness in Dairy Freestall Barns  
Geir Naess, (Presenting Author), Nord University, Steinkjer, Norway (Knut Egil Boe, Lars Erik Ruud)

11:00AM  ILES18-019  Production of Recycled Manure Solids used as Bedding for Dairy Cows in Canada: Analysis of Solid-Liquid Separation and Composting Methods  
Stephane Godbout, (Presenting Author), Universite Laval, Quebec City, Quebec Canada (Sebastien Fournel, Stephane Godbout, Pierre Ruel, Annie Fortin, Karine Duquette-Lozeau, Valerie Letourneau, Mylene Genereux, Joanie Lemieux, Denis Potvin, Caroline Cote, Caroline Duchaine, Doris Pellerin)

11:15AM  ILES18-097  Farrowing Pens for Loose Sows and Floor Cleanliness  
Knut Egil Boe, (Presenting Author), Norwegian University of Life Sciences, As, Norway (Knut Egil Boe, Greg Cronin, Evelyn Hall)

11:30AM  ILES18-013  Responses of Laying Hens to Full vs. Partial Litter Access in Aviary Housing  
Jofran Oliveira, (Presenting Author), Iowa State University, Ames, Iowa (Jofran Oliveira, Hongwei Xin)

11:45AM  ILES18-002  Modern Sheep Barns in Cold Climate - Preference by Shorn Sheep for Different Types of Slatted Flooring  
Grete H.M. Jorgensen, (Presenting Author), NIBIO, Tjotta, Nordland, Norway (Juni Rosann Engelien Johansen, Knut Egil Boe)

II.  Precision Livestock Farming

MODELING  
Moderator:  Richard S. Gates, University of Illinois, Urbana, Illinois  
Location:  Iowa

10:30AM  ILES18-157  Results of Precision Livestock Farming Technology in Europe  
Daniel Berckmans, (Presenting Author), KU Leuven, Leuven, Belgium (Daniel Berckmans, Tomas Norton)

10:45AM  ILES18-133  Real-Time Grower-Finisher Pigs Growth Monitored and Forecasted using a Dynamic Linear Regression Model  
Daniel Berckmans, (Presenting Author), KU Leuven, Leuven, Belgium (Alberto Pena Fernandez, Tomas Norton, Erik Vranken, Daniel Berckmans)

11:00AM  ILES18-043  Using an Artificial Neural Network to Predicting Pig Weight from Depth Images  
Isabella Condotta, (Presenting Author), ESALQ/USP (Isabella Condotta, Tami Brown-Brandl, Kesia Oliveira da Silva Miranda, Rafael Vieira de Sousa)
11:15AM  ILES18-042 Autoregressive Model to Identify Anomalous Decreases in Feeding Time of Grow-Finish Pigs
Felix Adrion, (Presenting Author), University of Hohenheim, Stugartt, Germany
(Felix Adrion, Tami Brown-Brandl, David Jones, Eva Gallmann)

11:30AM  ILES18-004 Evaluating a LiDAR Sensor and Artificial Neural Network Based-Model to Estimate Cattle Live Weight
Rafael Vieira de Sousa, (Presenting Author), University of Sao Paulo, Pirassununga, SP Brazil (Rafael Vieira de Sousa, Rubens Andre Tabile, Ricardo Yassushi Inamasu, Luciane Silva Martelo)

III. Air Quality – Measurement and Abatement of Aerial Pollutants

AMMONIA
Moderator: David Parker, USDA ARS, Bushland, Texas
Location: Nebraska

10:30AM  ILES18-137 Unintended Impacts on Animal Welfare and Environment of Combined Farm Animal Housing with Manure Storage
Eileen Fabian-Wheeler, (Presenting Author), Penn State University, University Park, Pennsylvania (Eileen Fabian-Wheeler)

10:45AM  ILES18-114 Effect of Ferric Sulfate Application on Clostridium spp in Poultry Litter
Hong Li, (Presenting Author), University of Delaware, Newark, Delaware (Hong Li, Amy Biddle)

11:00AM  ILES18-078 Use of Aluminum Sulfate (Alum) to Reduce Ammonia Emissions from Cattle Bedded Manure Packs
Mindy Spiehs, (Presenting Author), USDA ARS US Meat Animal Research Center, Clay Center, Nebraska (Mindy Spiehs)

11:15AM  ILES18-071 Improving Air Quality for Animals and Humans with Renewable Energy and Nutrient Conservation
John George, P.E., (Presenting Author), Agricultural Engineering Associates, Inc, Uniontown, Kansas (John George, Richard Mattocks, Mark Moser, John Paul Smith, Rick Thomas)

11:30AM  ILES18-061 Impact of Slatted Floor on Ammonia Emissions in Fattening Swine Housing
Joahnn Palacios, (Presenting Author), IRDA-Research and Development Institute for the Agri-Environment, Quebec, Quebec Canada (Joahnn Palacios, Stephane Godbout, Sebastien Turcotte, Marie-Aude Ricard)

11:45AM  ILES18-052 Ammonia and Size Fractioned Particulate Matter Emission Factors for a Cage-Free Layer Facility in Canada
Patrick McGrath, (Presenting Author), University of Guelph, Guelph, Ontario Canada (Jaime Anderson, Patrick McGrath, Hanna Ivankovic, Bill Van Heyst)
IV. Precision Livestock Farming
MODELING AIRFLOW – CFD APPLICATIONS

Moderator: Christopher Choi, University of Wisconsin-Madison, Madison, Wisconsin
Location: Lewis

10:30AM ILES18-145 Modeling Hen House Ventilation Options for Cage-free Environment: Two-Dimensional Case
Eileen Fabian-Wheeler, (Presenting Author), Penn State University, University Park, Pennsylvania (Eileen Fabian-Wheeler, Long Chen, Dan Hofstetter, Paul Patterson, John Cimbala)

10:45AM ILES18-121 Optimal Sensor Placement for Temperature Monitoring inside Broiler Houses
Sang-yeon Lee, (Presenting Author), Seoul National University, Seoul, Korea (Uk-hueon Yeo, In-bok Lee, Rack-woo Kim, Sang-yeon Lee, Gwanyong Park)

11:00AM ILES18-020 Analysis of Aerodynamic Problems of Domestic Swine Houses and Development of Educational VR Simulator
Jun-Gyu Kim, (Presenting Author), Seoul National University, Seoul, Korea (Ha Tae-Hwan)

11:15AM ILES18-058 Optimal Placement and Size of the Baffles used to Direct Airflow in Mechanically-Ventilated Dairy Housing – A Computational Study
Bo Zhou, (Presenting Author), University of Wisconsin, Madison, Wisconsin (Christopher Choi, Bo Zhou, Xiaoshuai Wang, Mario Mondaca)

11:30AM ILES18-125 Annual Electrical Energy Requirements of Five Cooling Strategies for Lactating Dairy Confinement Housing in the Eastern United States
Ted Funk, (Presenting Author), University of Illinois, Savoy, Illinois (Curt Gooch, Richard Stowell, Jiangong Li)

11:45AM ILES18-063 Improving Air Quality and Effective Cowside Velocity (ECV) inside Modern Dairy Facilities
Michael Wolf DVM, (Presenting Author), Country Doctors, Menomonie, Wisconsin (Michael Wolf, John McBride)

12:00PM - 1:30PM Luncheon with Keynote Speaker
Moderator: Hongwei Xin, Iowa State University, Ames, Iowa
Location: Grand Ballroom Center/West
12:00PM Larry J. Sadler, Vice President of Animal Welfare, United Egg Producers.
“Animal Welfare Issues Facing the U.S. Egg Industry”
V. Animal Responses to Environment

RESPONSE TO THERMAL ENVIRONMENT

Moderator: Richard Stowell, University of Nebraska, Lincoln, Nebraska
Location: Missouri

1:30PM ILES18-067 Assessment of Housing Environment and its Impact on Dairy Behavior and Milk Production in Northeastern China
Yujian Lu, (Presenting Author) China Agricultural University, Beijing, China
(Yujian Lu, Chaoyuan Wang, Shaojie Wang, Haoxiang Zhao, Li Dong, Zhengxiang Shi, Baoming Li)

1:45PM ILES18-153 Impact of Brazilian Pig Farm Construction and Environmental Management Practices on Nursery Pig Performance – A Case Study
Eliene Justino, (Presenting Author) Campinas, Sao Paulo Brazil (Eliene Justino, Fausto Maluf, Kenneth Casey)

2:00PM ILES18-077 High Ambient Temperature Impacts Semen Quality in Boars and Potential Molecular Drug-Targets and Nutritional Strategies for Amelioration
Yansen Li, (Presenting Author) Nanjing Agricultural University, Nanjing China (Yansen Li, Zhaojian Li, Jiaqin Chen, Chunmei Li)

2:15PM ILES18-140 Evaluation of Environmental Temperature on Pullet Weight Gain and Uniformity

2:30PM ILES18-151 Effect of Different Levels of Air Velocity at 35°C on Japanese Quail Behavior at Start of Lay
Tatiany Carvalho dos Santos, (Presenting Author) Universidades Federal de Vicoso, Vicoso, Minas Gerais Brazil (Tatiany Santos, Richard S. Gates, Ilda Tinoco, Sergio Zolnier, Leticia Freitas, Marcia Candido)

VI. Precision Livestock Farming

AUTONOMOUS OR ROBOTIC SYSTEM

Moderator: Daniella Jorge de Moura, University of Campinas, Campinas, Brazil
Location: Iowa

1:30PM ILES18-034 Automatic Identification of Broiler Mortality Using Image Processing Technology
Veera Muvva, (Presenting Author) Mississippi State University, Mississippi State, Mississippi (Veera V.R.M.K.R. Muvva, Yang Zhao, Pratik Parajuli, Song Zhang, Tom Tabler, Joseph Purswell)

1:45PM ILES18-142 Comparative Evaluation of Poultry Avoidance Distances to Human vs. Robotic Vehicle
Pratik Parajuli, (Presenting Author) Mississippi State University, Starkville, Mississippi (Yanbo Huang, Yang Zhao, Tom Tabler, Joseph Purswell)

2:00PM ILES18-053 Survey and Future Prospects in Precision Dairy Farming
Hugo Milan, (Presenting Author) Cornell University, Ithaca, New York (Hugo Milan, Kristen Perano, Kifle Gebremedhin)
2:15PM  ILES18-112  Automated Milking Systems for Dairy Operations  
Joe Horner, (Presenting Author) University of Missouri, Columbia, Missouri 
(Joseph Zulovich, Ryan Milhollin, Joseph Harner, Joe Horner)

2:30PM  ILES18-111  Robotic Rotary Parlor Systems for Dairy Operations  
Joe Horner, (Presenting Author) University of Missouri, Columbia, Missouri 
(Joseph Zulovich, Ryan Milhollin, Joseph Harner, Joe Horner)

2:45PM  ILES18-029  Function of Automatic Manure Scrapers  
Lars Erik Ruud, (Presenting Author) Inland Norway University of Applied Sciences, 
Hedmark, Norway (Lars Erik Ruud)

VII.  Air Quality – Measurement and Abatement of Aerial Pollutants

AMMONIA

Moderator:  Mindy Spiehs, USDA ARS, Clay Center, Nebraska  
Location:  Nebraska

1:30PM  ILES18-048  Improving Air Quality in Swine Buildings by Using a Combination of Technologies – Pilot-scale Tests  
Ariane Levesque, (Presenting Author) IRDA, Quebec, Quebec Canada (Ariane Levesque, Matthiew Girard, Valerie Letourneau, Caroline Duchaine, Stephane Godbout, Stephane Lemay)

1:45PM  ILES18-104  USDA-NRCS Opportunities for Assisting Producers in Addressing Air Emissions  
Gregory Zwicke, (Presenting Author) USDA-NRCS, Fort Collins, Colorado (Greg Zwicke, Greg Johnson)

2:00PM  ILES18-115  Determination of Activation Humidity Thresholds for Acid Based Litter Amendment under Winter Conditions  
Hong Li, (Presenting Author) University of Delaware, Newark, Delaware (Hong Li)

2:15PM  ILES18-106  Behavioral Responses of Laying Hens to Atmospheric Ammonia in an Environmental Preference Chamber  
Christina Tucker, (Presenting Author) University of Illinois, Urbana, Illinois (Christina Tucker, Angela Green-Miller, Richard S. Gates, San Myint, Janeen Salak-Johnson)

3:00PM - 3:30PM   BREAK
**3:30PM - 5:00PM**

**Panel Discussion - Collaborative Visions: Advancing Solutions for Modern Livestock and Poultry Production**

**Organizers:**
Tim Shepherd, Iowa State University, Ames, Iowa
Jacob Mayer, Settje Agri-Services & Engineering, Inc., Raymond, Nebraska

**Location:** Lewis/Clark

**Moderator:** Dr. Tom Field

*Director, Engler Agribusiness Entrepreneurship Program, University of Nebraska*

*Engler Chair in Entrepreneurship, University of Nebraska*

*Co-Owner, Field Land Cattle Company, LLC*

**Panelists:**

- **Dr. Bob Collier**
  *Professor Emeritus, University of Arizona*
  *Dairy Science, Heat Stress, & Environmental Physiology*

- **Dr. Daniel Berckmans**
  *Professor and Head of M3-BIORES, KU Leuven*
  *Precision Livestock Farming: Development and Commercialization*

- **Sarah Pillen**
  *Partner, Pillen Family Farms, Columbus, Nebraska*
  *Modern Genetic, Breeding-Gestation, Farrowing, Nursery, & Grow-Finish Systems*

- **Amy Staples**
  *Director of R&D, Regulatory Compliance, Adams Land and Cattle, Broken Bow, NE*
  *Feeding over 130,000 head, integrating applied research & development facilities*

- **J.T. Dean**
  *President, Versova, Sioux Center, Iowa*
  *Integrated Management & Advanced Systems for Egg Production and Processing*

- **Dr. Locke Karriker**
  *Director, Swine Medicine Education Center, Iowa State University*
  *Professor & Interim Chair, Veterinary Diagnostic and Production Animal Medicine Education & Research: Prevention, Diagnosis, & Treatment of Swine Diseases*

- **Dr. Juan Tricarico**
  *Vice-President of Sustainability Research, Innovation Center for U.S. Dairy*
  *President-Elect, Council for Agricultural Science and Technology (CAST)*
  *Scientific Soundness, Economic Viability, & Social Responsibility of Ag Production*

**5:00PM - 6:30PM**

**Networking Reception**

**Location:** Winnebago/Flanagan

Opportunity to continue discussions from the panel discussion. Plan to network with and meet new colleagues. Refreshments and a cash bar will be available.
WEDNESDAY, SEPTEMBER 26
7:00AM - 4:00PM  Registration
   Location: Grand Ballroom East

8:00AM - 9:30AM  Concurrent Sessions VIII, IX, X

VIII. Animal Responses to Environment

BUILDING AND THERMAL CONTROL SYSTEMS
   Moderator:  Brett Ramirez, Iowa State University, Ames, Iowa
   Location:  Missouri

8:00AM  ILES18-138  Comparison of Outside Air and Sol-air Design Temperatures for Estimating Insulation Needs
   Gary Daniel Chesser, Jr., (Presenting Author) Mississippi State University, Mississippi State, Mississippi (Daniel Chesser, Joseph Purswell, Jeremiah Davis, Jason Ward, Tom Tabler, Yang Zhao)

8:15AM  ILES18-007  Control Algorithm Development and Simulation for Comparing Evaporative Pads and Sprinklers for Grow-Finish Pigs
   Brett Ramirez, (Presenting Author) Iowa State University, Ames, Iowa (Brett Ramirez, Steven Hoff, Jay Harmon)

8:30AM  ILES18-033  Thermal Environment Evaluation of a Novel Positive Pressure Filtered Ventilation System in a Swine Breeding-Gestation Barn
   Benjamin Smith, (Presenting Author) Iowa State University, Ames, Iowa (Benjamin Smith, Blake Fonken, John Stinn, Steven Hoff, Jay Harmon)

8:45AM  ILES18-130  Thermal Performance of Perforated Pen Panels for On-Farm Nutritional Test Trials
   Kelly Goneke, (Presenting Author) Auburn University, Auburn, Alabama (Kelly Goneke, Jeremiah Davis, Joseph Purswell, Daniel Chesser, Carson Edge, Jesse Campbell)

9:00AM  ILES18-154  Thermocline Design for Thermal Preference Testing in Piglets
   Angela R. Green-Miller, (Presenting Author) University of Illinois, Urbana, Illinois (Lindsey Robbins, Angela Green, Jay Johnson)

IX. Precision Livestock Farming

IMAGE ANALYSIS
   Moderator:  Daniel Berckmans, Katholieke Universiteit Leuven, Leuven, Belgium
   Location:  Iowa

8:00AM  ILES18-143  Evaluation of a Low Cost Thermographic Camera for Poultry Temperature

8:15AM  ILES18-128  Neonatal Piglet Core Body Temperature Model from Surface Temperature and Environment Measurements
   Yijie Xiong, (Presenting Author) University of Illinois, Urbana, Illinois (Yijie Xiong, Richard S. Gates, Naomi Cooper, Michael Ellis)
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30AM</td>
<td>ILES18-060</td>
<td>Measurement of 3-D Surface Area of Piglets</td>
<td>Hugo Milan, (Presenting Author) Cornell University, Ithaca, New York (Hugo Milan, Gustavo Moura, Patric Castro, Alex Maia, Kifle Gebremedhin)</td>
</tr>
<tr>
<td>8:45AM</td>
<td>ILES18-119</td>
<td>A 3D Computer Vision System for Automatic Detection of Sheep Standing and Lying Behaviour</td>
<td>Inger Hansen, (Presenting Author) NIBIO, Norwegian Institute of Bioeconomy Research, Sweden (Keni Ren, Grete Jorgensen, Inger Hansen, Johannes Karlsson)</td>
</tr>
<tr>
<td>9:00AM</td>
<td>ILES18-018</td>
<td>An Image Acquisition System for Studying Behaviors of Sows and Piglets in Farrowing Barns</td>
<td>Suzanne Leonard, (Presenting Author) Iowa State University, Ames, Iowa (Suzanne Leonard, Hongwei Xin, Tami Brown-Brandl, Brett Ramirez)</td>
</tr>
</tbody>
</table>

X. Air Quality – Measurement and Abatement of Aerial Pollutants

**GREENHOUSE GAS**

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00AM</td>
<td>ILES18-026</td>
<td>Determining Environmental Benefits and Economic Costs of Different Manure Handling Strategies in Quebec’s Dairy Production using Farm Simulation</td>
<td>Sebastien Fournel, (Presenting Author) Universite Laval, Quebec City, Quebec Canada (Sebastien Fournel, Edith Charbonneau, Simon Binggeli, Jean-Michel Dion, Doris Pellerin, Martin Chantigny, Stephane Godbout)</td>
</tr>
<tr>
<td>8:15AM</td>
<td>ILES18-134</td>
<td>Virtual Farm Website for Dairy Climate Change and Sustainability Information</td>
<td>Eileen Fabian-Wheeler, (Presenting Author) Penn State University, University Park, Pennsylvania (Eileen Fabian-Wheeler, Daniel Hofstetter, Rebecca Larson, Horacio Aguirre-Villegas, Carolyn Rumery Betz)</td>
</tr>
<tr>
<td>8:30AM</td>
<td>ILES18-093</td>
<td>Enteric and Simulated Pen Surface Emissions of Nitrous Oxide from Beef Cattle Feedyards</td>
<td>David Parker, (Presenting Author) USDA-ARS, Bushland, Texas (David Parker, Kenneth Casey, Heidi Waldrip, Jenny Jennings, Kristen Hales, Richard Todd)</td>
</tr>
<tr>
<td>8:45AM</td>
<td>ILES18-146</td>
<td>Evaluation of Methane Production Manipulated by Level of Intake in Growing Cattle and Corn Oil in Finishing Cattle</td>
<td>Thomas Winders, University of Nebraska-Lincoln, Lincoln, Nebraska (Thomas Winders, Brad Boyd, Henry Hilscher, Richard Stowell, Samodha Fernando, Galen Erickson)</td>
</tr>
<tr>
<td>9:00AM</td>
<td>ILES18-102</td>
<td>Enteric Methane Emissions of Beef Cows Grazing Tallgrass Prairie Pasture on the Southern Great Plains</td>
<td>Richard Todd, (Presenting Author) USDA-ARS, Bushland, Texas (Richard Todd, Corey Moffet, James Neel, Kenneth Turner, Jean Steiner, Andy Cole)</td>
</tr>
<tr>
<td>9:15AM</td>
<td>ILES18-148</td>
<td>Evaluating the Effect of Feeding Biochar to Cattle on Methane Production and Diet Digestibility</td>
<td>Thomas Winders, (Presenting Author) University of Nebraska-Lincoln, Lincoln, Nebraska (Thomas Winders, Melissa Jolly-Breithaupt, Galen Erickson, Andrea Watson)</td>
</tr>
</tbody>
</table>


9:30AM - 11:00AM  **Poster Session & Coffee Break** – All posters will be available at this time. Poster Presenters will be at their poster to present as follows: Even poster numbers will be presented 9:30am-10:30am. Odd poster numbers will be presented 10:00am-11:00am.

Moderators:  Richard Stowell, University of Nebraska, Lincoln, Nebraska  
Tami Brown-Brandl, USDA-ARS-MARC, Clay Center, Nebraska  
Kenneth Casey, Texas A&M AgriLife Research, Amarillo, Texas

Location:  Winnebago/Flanagan

**Animal Responses to Environment - POSTER SESSION**

**ARE-1 ILES18-031 Fan Placement in Horse Stalls**
Staci McGill, (Presenting Author) University of Kentucky, Lexington, Kentucky  
(Staci McGill, Morgan Hayes, Robert Coleman)

**ARE-2 ILES18-039 Effect of Dairy Cows Cooling on Milk Production in Slovakian Lowlands**
Jan Broucek (Presenting Author) National Agricultural and Food Centre, Research Institute for Animal Production Nitra, Luzianky, Slovakia  
(Jan Broucek, Stefan Ryba, Marta Dianova, Michael Uhrincat, Miloslav Soch, Anton Hanus, Lubos Zabransky)

**ARE-3 ILES18-040 Effect of Water Delivery Manner on Dairy Calf Performance**
Jan Broucek (Presenting Author) National Agricultural and Food Centre, Research Institute for Animal Production Nitra, Luzianky, Slovakia  
(Jan Broucek, Miloslav Uhrincat, Anton Hanus, Miloslav Soch, Peter Tongel, Lubos Zabransky)

**ARE-4 ILES18-056 Identification of Differentially Expressed Genes Associated with Breast Meat Yield of Broilers in Response to Atmospheric Ammonia using RNA Sequencing**
Bao Yi, (Presenting Author) Beijing, China  
(Bao Yi, Liang Chen, Ruqing Zhong, Hongfu Zhang)

**ARE-5 ILES18-089 Space Allowance and Flooring in Ewes**
Knut Egil Boe, (Presenting Author) Norwegian University of Life Sciences, As, Norway  
(Knut Egin Boe, Stine Gronmo Kischel)

**ARE-6 ILES18-152 Effect of Different Levels of Air Velocity and Temperature on Japanese Quail Performance at Start of Lay**
Tatiany Carvalho dos Santos, (Presenting Author) Universidade Federal de Vicosa, Vicosa, Minas Gerais, Brazil  
(Tatiany Santos, Richard S. Gates, Ilda Tinoco, Sergio Zolnier, Raafaela Andrade, Leticia Freitas, Carlos Teles Junior)

**Precision Livestock Farming - POSTER SESSION**

**PLF-1 ILES18-055 Development of a Rainwater Harvesting Model for Broiler Farms to Estimate On-farm Storage Needs**
Carson Edge, (Presenting Author) Auburn University, Auburn, Alabama  
(Carson Edge, Jeremiah Davis, William Batchelor, Eugene Simpson, Joseph Purswell)

**PLF-2 ILES18-005 Computational Fluid Dynamics Model for Air Velocity through a Poultry Transport Trailer in a Holding Shed**
Yi Liang, (Presenting Author) University of Arkansas, Fayetteville, Arkansas  
(Christian Heymsfield, Yi Liang, Thomas Costello)

**PLF-3 ILES18-032 Simulation to Improve Temperature and Airflow Patterns in Tunnel Ventilation Systems**
Daniella Jorge de Moura, (Presenting Author) UNICAMP, Campinas, Sao Paulo Brazil  
(Daniella Moura, Vilmar Sousa Junior)
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PLF-6</td>
<td>ILES18-069</td>
<td>Application of an Automated Early-Warning Leak Detector for Earthen Wastewater Holding Structures using Non-Invasive Geophysical Instrumentation</td>
<td>Bryan Woodbury, (Presenting Author) USDA, Clay Center, Nebraska (Bryan Woodbury, Roger Eigenberg)</td>
</tr>
<tr>
<td>PLF-7</td>
<td>ILES18-158</td>
<td>Performance of Pregnant West African Dwarf Ewes Fed Diets Supplemented with Varying Levels of Fossil Shell Flour</td>
<td>Emeruwa Chibuisi Henry, (Presenting Author) Farys Farm, Ibadan, Oyo State, Nigeria (Emeruwa Chibuisi Henry, Ngozi Felicia Anurudu)</td>
</tr>
<tr>
<td>PLF-8</td>
<td>ILES18-090</td>
<td>Is the Environmental Automated Control the Answer for Foot Pad Dermatitis in Intensive Broiler Chickens Farming?</td>
<td>Marcella Guarino, (Presenting Author) Universita degli Studi di Milano, Milano, Italy (Emanuela Tullo, Giacomo Aletti, Alessandra Micheletti, Giovanni Naldi, Alberto Pena Fernandez, Erik Vranken, Daniel Berckmanns, Marcella Guarino)</td>
</tr>
<tr>
<td>PLF-9</td>
<td>ILES18-120</td>
<td>Estimation of THI Index to Evaluate Thermal Stress of Animal-Occupied Zone in a Broiler House using BES Method</td>
<td>Kyeong-Seok Kwon, (Presenting Author) Jeonju, Jeollabukdo, Korea (Taehwan Ha, Hee-Chul Choi, Jong-Bok Kim, Jung-Hwan Jeon, Saemee Woo, Ka-Young Yang, In-Bok Lee)</td>
</tr>
</tbody>
</table>

**Air Quality - Measurement and Abatement of Aerial Pollutants - POSTER SESSION**

<table>
<thead>
<tr>
<th>AQ-1</th>
<th>ILES18-016</th>
<th>The Emission Laws and Prediction Model of Air Pollutants in Fattening Pig Houses</th>
<th>Shihua Pu (Presenting Author) Chongqing Academy of Animal Sciences, Rongchang, Chongqing, China (Dingbiao Long, Shihua Pu, Zuohua Liu, Yaqiong Zeng)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AQ-2</td>
<td>ILES18-065</td>
<td>Numerical Modelling of Negative Air Ionization for Removing Viral Bioaerosols in an Enclosed Space</td>
<td>Desmond Essien, (Presenting Author) University of Manitoba, Winnipeg, Manitoba Canada (Desmond Essien, Qiang Zhang, David Levin, Kevin Coombs)</td>
</tr>
<tr>
<td>AQ-4</td>
<td>ILES18-072</td>
<td>Effect of Slatted Floor Configuration on Air Quality and Floor Cleanliness in a Sow Barn</td>
<td>Xiaojie Yan, (Presenting Author) University of Manitoba, Winnipeg, Manitoba Canada (Xiaojie Yan, Qiang Zhang, Laurie Connor)</td>
</tr>
</tbody>
</table>
Comparison of Airborne Particulate Matter and Ammonia Concentrations from Nursing and Fattening Rooms in Large Semi-Enclosed Swine House
Zhaojian Li, (Presenting Author) Nanjing, Jiangsu Province, China (Zhaojian Li, Sheng Wu, Dan Shen, Qiang Tang, Pengyuan Dai, Yansen Li, Chunmei Li)

Emissions of Hydrogen Sulfide from the Pen Area of a Beef Cattle Feedyard in the Texas High Plains
Kenneth Casey, (Presenting Author) Texas A&M AgriLife Research, Amarillo, Texas (Richard Todd, Kenneth Casey, Marty Rhoades, David Parker)

Relationship Between Aerosol Concentration and Airborne Microbe including Porcine Sapelovirus Concentration in Japanese Weaning Swine Houses
Takanori Naide, (Presenting Author) Tokyo University of Agriculture and Technology, Fuchu, Tokyo, Japan (Takanori Naide, Atsuo Ikeguchi, Md Aminul Islam, Ayako Miyazaki, Ken Katsuda, Kenji Kawashima, Ryoh Nakakubo)

Mitigating Hydrogen Sulfide Safety Risk and Odor for Dairy Farms using Gypsum Bedding
Eileen Fabian-Wheeler, (Presenting Author) Penn State University, University Park, Pennsylvania (Eileen Fabian-Wheeler, Long Chen, Michael Hile, Michael Pate)

11:00AM - 12:30PM Concurrent Sessions XI, XII, XIII

XI. Animal Responses to Environment
VENTILATION AND COOLING SYSTEMS
Moderator: Kevin Janni, University of Minnesota, St Paul, Minnesota
Location: Missouri

11:00AM ILES18-057 Thermal Environmental Performance of a Dairy Barn Cross-Ventilated in Warm Weather and Naturally Ventilated in Cool Weather
Kevin Janni, (Presenting Author) University of Minnesota, St. Paul, Minnesota (Kevin Janni, James Salfer, Erin Cortus, Johanna Knorr)

11:15AM ILES18-109 Air Conditioning for Naturally Ventilated Dairy Barns
Joe Zulovich, (Presenting Author) University of Missouri, Columbia, Missouri (Joseph Zulovich, Ryan Milhollin, Joe Horner, Joseph Harner, Teng Teeh Lim)

11:30AM ILES18-110 Air Conditioning for Mechanically Ventilated LPCV Dairy Barns
Joe Zulovich, (Presenting Author) University of Missouri, Columbia, Missouri (Joseph Zulovich, Ryan Milhollin, Joe Horner, Joseph Harner, Teng Teeh Lim)

11:45AM ILES18-144 Feasibility Study of Environmental Control of Dairy Barns using Air Conditioning Or Evaporative Cooling
Ted Funk, (Presenting Author) University of Illinois, Urbana, Illinois (Jiangong Li, Xuejin Shen, Ted Funk, Xinlei Wang)

12:00PM ILES18-098 Impact of Shade in Beef Feedyards on Performance, Body Temperature, and Heat Stress Measures
Brett Melton, (Presenting Author) University of Nebraska-Lincoln, Lincoln, Nebraska (Brett Melton, Bradley Boyd, Casey Macken, James MacDonald, Galen Erickson)

12:15PM ILES18-135 Conductive Cooling of Group-Housed Grow-Finish Pigs: Year 1
Erin Cortus, (Presenting Author) University of Minnesota, St. Paul, Minnesota (Erin Cortus, Joseph Darrington, Robert Thaler)
XII. Precision Livestock Farming

DISEASE OR STRESS DETECTION

Moderator: Tami Brown-Brandl, USDA-ARS-MARC, Clay Center, Nebraska
Location: Iowa

11:00AM ILES18-073 Application of an Early Warning to Detect Enteropathies in Intensive Broiler Farming
Marcella Guarino, (Presenting Author) Universita degli Studi di Milano, Milano, Italy (Emanuela Tullo, Federica Borgonovo, Guido Grilli, Alessandra Micheletti, Giacomo Aletti, Susanna Lolli, Valentina Ferrante, Marcella Guarino)

11:15AM ILES18-127 Computational Program to Evaluate Thermal Comfort in Animal Production Facilities
Richard S. Gates, (Presenting Author) University of Illinois, Urbana, Illinois (Carlos Gutemberg de Souza Teles Junior, Richard S. Gates, Ilda de Fatima Ferreira Tinoco, Cecilia de Fatima Souza, Monique de Oliveira Vilela)

11:30AM ILES18-023 A Real-Time Sow Behavior Analysis System to Predict an Optimal Timing for Insemination
Jacquelin Labrecque, (Presenting Author) Ro-Main, St-Lambert-de-Lauzon, Quebec Canada (Jacquelin Labrecque, Joel Rivest)

11:45AM ILES18-059 Development of a Real-time Wireless Biosensor to Monitor Heat Stress of Dairy Cows
Christopher Choi, (Presenting Author) University of Wisconsin, Madison, Wisconsin (Christopher Choi, Hanwook Chung, Jingjie Li, Younghyun Kim)

12:00PM ILES18-006 Construction and Performance of a Self-Contained, Temperature-Controlled Heat Source (Electronic Chicken) to Quantify Thermal Load during Live Haul of Broiler Chickens
Yi Liang (Presenting Author) University of Arkansas, Fayetteville, Arkansas (Kaushik Luthra, Yi Liang, Thomas Costello, James Andress)

XIII. Air Quality – Measurement and Abatement of Aerial Pollutants

PARTICULATE MATTER & MICROBES

Moderator: Stephane Godbout, IRDA, Quebec, Quebec Canada
Location: Nebraska

11:00AM ILES18-141 Spatial and Diurnal Variations of Particulate Matter Concentration of a Pilot-Scale Aviary Layer House in Winter
Yu Wang, (Presenting Author) Iowa State University, Ames, Iowa (Yu Wang, Dapeng Li, Suzanne Leonard, Zhengxiang Shi, Hongwei Xin, Lilong Chai, Baoming Li)

11:15AM ILES18-132 Real-Time Monitoring of Indoor Particulate Matter Concentration in a Commercial Broiler House

11:30AM ILES18-070 Effectiveness of Negative Air Ionization in Removing Airborne Porcine Reproductive and Respiratory Syndrome Virus (PRRSV)
Amy La, (Presenting Author) University of Manitoba, Winnipeg, Manitoba Canada (Amy La, Qiang Zhang, David Levin, Kevin Coombs)
11:45AM ILES18-094  Spatial Variation of PM Concentration and Particle Size Distribution of a Perchery System with Large Cage Aviary Unit for Laying Hens
Zongyang Li, (Presenting Author) China Agricultural University, Beijing, China (Zongyang Li, Chaoyuan Wang, Baoming Li, Zhengxiang Shi, Weichao Zheng, Guanghui Teng)

12:00PM ILES18-012  Particulate Matter Suppression and Heat Stress Relief in a Cage-free Hen House
Hongwei Xin, (Presenting Author) Iowa State University, Ames, Iowa (Lilong Chai, Hongwei Xin, Yu Wang, Jofran Oliveira, Kailao Wang, Yang Zhao)

12:15PM ILES18-131  Prevention of PM and Airborne Bacteria Transmission between Double-Tunnel Ventilation Layer Hen Houses
Weichao Zheng, (Presenting Author) China Agricultural University, Beijing, China (Zongyang Li, Weichao Zheng, Baoming Li, Chaoyuan Wang, Zhengxiang Shi, Guanghui Teng)

12:30PM - 2:00PM  Lunch Break – On Your Own

2:00PM - 3:30PM  Concurrent Sessions XIV, XV, XVI

XIV. Animal Responses to Environment
LIGHTING SYSTEMS AND EFFECTS
Moderator: Joseph Purswell, USDA-ARS, Mississippi State, Mississippi
Location: Missouri

2:00PM ILES18-046  Temporal Variability of Illuminance in Commercial Broiler Houses
Joseph Purswell, (Presenting Author) USDA-ARS, Mississippi State, Mississippi (Joseph Purswell, John Linhoss, Hammed Olanrewaju)

2:15PM ILES18-149  Light Intensity, Egg Weight and Egg Size in a Vertical Aviary of Naturally Ventilated Laying Hens
Richard S. Gates, (Presenting Author) University of Illinois, Urbana, Illinois (Leticia Cibele da Silva Ramos Freitas, Ilda de Fatima Ferreira Tinoco, Tatiany Carvalho dos Santos, Marcia Gabrielle Lima Candido, Cecilia de Fatima Souza, Richard S. Gates)

2:30PM ILES18-086  Egg Laying Pattern of Hens in a Multiple Tiers Aviary System
Xuanyang Li, (Presenting Author) China Agricultural University, Beijing China (Xuanyang Li, Liu Yang, Xiaocui Wang, Zhengxiang Shi, Baoming Li, Qin Tong)

2:45PM ILES18-079  Performance Evaluation of High-Efficiency Fan Shades in Reduction of Light Leakage and Spatial Variation of Illuminance in Commercial Broiler Houses
John Linhoss (Presenting Author) Mississippi State University, Starkville, Mississippi (John Linhoss, Joseph Purswell, Daniel Chesser, Wes Lowe)

3:00PM ILES18-062  Effects of Exposing Eggs to Various Green Light Intensities during Incubation on Hatch Performance, Post-Hatch Grow Performance, Fear and Stress Responses in Layer Chicks
Kailao Wang, (Presenting Author) Iowa State University, Ames, Iowa (Yue Yu, Zhanming Li, Jinming Pan)

3:15PM ILES18-011  Behavioral and Production Responses of W-36 Chicks to Supplementary UVA Light
Kai Liu, (Presenting Author) Iowa State University, Ames, Iowa (Kai Liu, Kailao Wang, Tao Fei, Lilong Chai, Hongwei Xin)
XV. Precision Livestock Farming
RFID APPLICATIONS
Moderator: Felix Adrion, University of Hohenheim, Stuttgart, Germany
Location: Iowa

2:00PM ILES18-041 Development and Validation of a Low-Frequency RFID system for monitoring grow-finish pig feeding and drinking behavior
Tami Brown-Brandl, (Presenting Author) USDA-ARS-MARC, Aurora, Nebraska
(Tami Brown-Brandl, Felix Adrion, Roger Eigenberg, Eva Gallmann)

2:15PM ILES18-116 Practical Test and Evaluation of Optimized UHF Ear Tags for Behavior Monitoring of Fattening Pigs
Adrian Foerschner, (Presenting Author) University of Hohenheim, Stuttgart, Baden-Wuerttemberg Germany (Felix Adrion, Eva Gallmann)

2:30PM ILES18-024 A RFID-Based Monitoring System for Characterization of Perching Behaviors of Individual Poultry
Kailao Wang, (Presenting Author) Iowa State University, Ames, Iowa (Kailao Wang, Kai Liu, Hongwei Xin, Lilong Chai, Yu Wang, Tao Fei, Jofran Oliveira, Jinming Pan, Yibin Ying)

2:45PM ILES18-051 Radio-frequency Identification (RFID) System for Monitoring Specific Behaviors of Group Housed Broilers
Guoming Li, (Presenting Author) Mississippi State University, Starkville, Mississippi (Guoming Li, Yang Zhao, Rhet Hailey, Nan Zhang, Yuanji Liang, Joseph Purswell)

3:00PM ILES18-068 Activity Analysis to Detect Lameness in Pigs with a UHF-RFID System
Anita Kapun, (Presenting Author) University of Hohenheim, Stuttgart Germany (Anita Kapun, Felix Adrion, Eva Gallmann)

3:15PM ILES18-107 Validation of Radio Frequency Identification with a Current Transducer to Quantify the use of an Automatic Grooming Brush in Pre-Weaned Dairy Calves
Melissa Cantor, (Presenting Author) University of Kentucky, Lexington, Kentucky (Morgan Falk, Melissa Cantor, Morgan Hayes, Josh Jackson, Joao HC Costa)

XVI. Air Quality – Measurement and Abatement of Aerial Pollutants
PARTICULATE MATTER & MICROBES
Moderator: Hong Li, University of Delaware, Newark, Delaware
Location: Nebraska

2:00PM ILES18-091 Concentrations and Distributions of Airborne Bacteria in a Growing Swine Building in China
Xiuping Tao, (Presenting Author) Institute of Environment & Sustainable Development in Agriculture, CAAS, Beijing, China (Xiuping Tao, Bin Shang, Hongmin Dong, Yongxing Chen)

2:15PM ILES18-081 Distribution of Particulate Matter in Poultry Layer Houses and In Vitro PM2.5-Induced Damage on Human Alveolar Epithelial Cells
Chunmei Li, (Presenting Author) Nanjing Agricultural University, Nanjing, Jiangsu, China (Dan Shen, Pengyuan Dai, Yansen Li, Chunmei Li)
Aerosols and Bacteria Concentration in Different Types of Japanese Dairy Milking Houses
Takanori Naide, (Presenting Author) Tokyo University of Agriculture and Technology, Tokyo, Japan (Md. Aminul Islam, Atsuo Ikeguchi, Takanori Naide)

Air Quality at Low Outdoor Temperatures in Norwegian Horse Stables
Knut Egil Boe, (Presenting Author) Norwegian University of Life Sciences, As, Norway (Knut Egin Boe, Guro Dragsund, Grete Jorgensen, Eileen Fabian-Wheeler)

3:30PM - 4:00PM  BREAK

4:00PM - 5:15PM  Closing Session
Moderator: Morgan Hayes, University of Kentucky, Lexington, Kentucky
Location: Lewis/Clark
4:00PM  Robert J. Collier, Emeritus Profess of the University of Arizona.
“Managing Animal Environments During an Era of Global Warming: Future Directions “

THURSDAY, SEPTEMBER 27
7:00AM - 5:30PM  Farm Industry Tour
This technical tour will allow attendees to experience Nebraska’s livestock production including the environmental controls in a new poultry facility, the management and design criteria for a cattle feedlot, and the opportunities with robotic milking systems. We’ll enjoy lunch at the Howell’s Ballroom at approximately 12pm while being addressed by the Past-President of the NE Pork Producers, Russ Vering.
- Lincoln Premium Poultry Chicken Farm, Hooper, Nebraska
- J&S Feedlot Beef Cattle Feedlot, Dodge, Nebraska
- Central Plains Milling Feed Mill, Howells, Nebraska
- Larson Farms Robotic Dairy, Creston, Nebraska

Please meet in the lobby of the DoubleTree to load the buses between 6:30am and 7:00am. The buses will depart promptly at 7:00am. This tour has a limited capacity. Please inquire at the ASABE registration desk about purchasing a ticket for this tour for $11.00.
Sponsors and Exhibitors of ILES X

THANK YOU

SILVER SPONSORS

Egg Industry Center

AP

BRONZE SPONSORS

Maurer-Stutz

CURRY-WILLE & ASSOCIATES CONSULTING ENGINEERS P.C.

EXHIBITORS

QUANTIFIED AG

IOWA STATE UNIVERSITY

ASABE

American Society of Agricultural and Biological Engineers