Anna Kerr Butters-Johnson, BSc, MSc, PhD
Professor, Animal Behavior and Welfare,
Department of Animal Science: 2356-F Kildee Hall, Iowa State University

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POSITION RESPONSIBILITY STATEMENT: 01/01/2021 TO 12/31/2025

Dr. Butters-Johnson Position of Responsibility Statement (PRS) is 40% research, 25% extension, 20% teaching and 10% service. Specifically, under these categories of responsibility the following areas were outlined for completion;

Teaching 20%
Teach an undergraduate and graduate course in animal behavior and welfare.

Research 45%
Lead a national and internationally extramurally research program encompassing sound scientific measures for farm animal behavior and welfare.

Extension 25%
Develop and maintain programs to enhance and improve farm animal welfare at state, national and international levels. Serve as a farm animal welfare expert for state, national and international organizations.

Service 10%
Serve the department of Animal Science, College or University in various capacities as requested.

POSITION RESPONSIBILITY STATEMENT: 02/12/2014 TO 12/31/2020

Dr. Butters-Johnson Position of Responsibility Statement (PRS) is 50% research, 25% extension and 25% teaching as agreed upon in her letter of intent and signed PRS, February 2014. Specifically, under these categories of responsibility the following areas were outlined for completion;

Teaching 25%
Teach an undergraduate and graduate course in animal behavior, welfare including contemporary issues related to these topics.

Research 50%
Lead a national and internationally reconciled extramurally research program encompassing sound scientific measures for farm animal behavior and welfare.

Extension 25%
Develop an on-going program to enhance and improve farm animal welfare at state, national and international level.
Serve as an expert for state, national and international organizations on the issue of animal welfare.

EDUCATION

Degree	Institution	Year
Ph. D. Animal Science	Texas Tech University	2001
MSc. Applied Animal Behaviour and Animal Welfare	University of Edinburgh	1997
BSc Animal Science with honours	University of Reading	1995

RECORD OF PROFESSIONAL EXPERIENCE

2020 to 2023. Professor, Animal Behavior and Welfare, and Tyrone D. Artz, M.D. Chair for Faculty Excellence in Animal Science. Department of Animal Science, Iowa State University, Ames, Iowa. *Appointment: 50% Research, 25% Extension, 25% Teaching.* Chair position recognizes a faculty member who has shown distinction in undergraduate education in animal agriculture and has a prominent research program in an area that strengthens and supports the improvement of animal agriculture in the state of Iowa. https://www.cals.iastate.edu/news/releases/iowa-state-university-department-animal-science-announces-artz-chair-faculty Ceremony Thursday October 28th 2021 https://youtu.be/enh3OJnnpzw

2018 to 2020. Professor, Animal Behavior and Welfare, Department of Animal Science, Iowa State University, Ames, Iowa. *Appointment: 50% Research, 25% Extension, 25% Teaching.*

2018 to present. Adjunct Professor, Animal Behavior and Welfare, Department of Animal Science, Texas Tech University, Lubbock, Texas. *Appointment: 100% Research.*

2014 to 2018. Adjunct Associate Professor, Animal Behavior and Welfare, Department of Animal Science, Texas Tech University, Lubbock, Texas. *Appointment: 100% Research.*

2011 to 2018. Associate Professor, Animal Behavior and Welfare, Department of Animal Science, Iowa State University, Ames, Iowa. *Appointment: 50% Research, 25% Extension, 25% Teaching.*

2006 to 2011. Assistant Professor, Animal Behavior and Welfare, Department of Animal Science, Purdue University, West Lafayette, Indiana. *Appointment: 100% Research.*

2005 to 2011. Assistant Professor, Animal Behavior and Welfare, Department of Animal Science, Iowa State University, Ames, Iowa. *Appointment: 50% Research, 25% Extension, 25% Teaching.*

2002 to 2005 (April) Director Animal Welfare at the National Pork Board, Clive, Iowa.
Oversight of a $3 million / year budget to implement swine welfare programs and research. Created the first on farm nationally recognized swine welfare program; Swine Welfare Assurance Program™ (SWAP™).

PAST AND CURRENT PROFESSIONAL ASSOCIATIONS (N = 6)

6. Professional Animal Care and Certification Organization. Third party auditor trainer for on-farm swine welfare. 2015 to present.
5. Gamma Sigma Delta. 2011 to present.
4. Professional Animal Care and Certification Organization. Third party auditor trainer for porcine and bovine slaughter auditing. 2007 to 2009.
3. American Association of Swine Veterinarians. 2003 to 2018.
2. American Society of Animal Science. 1999 to present.
1. International Society for Applied Ethology. 1997 to present.

AWARDS, HONORS AND RECOGNITION (N = 17)

17. 2021. *Department of Animal and Food Science. Hall of fame.* Texas Tech University. Advanced degree graduate of distinction. This Advanced degree is awarded to a person who has pursued an advanced degree (MS or Ph.D.) and who has achieved excellence in their field. October 8, 2021.
16. 2020. Iowa Pork Producers Association (IPPA). 2020 IPPA Presidents' Award. Iowa Pork Industry Center, Iowa State University. IPPA Board of Directors created a special award recognizing the IPIC-ISU for really delivering to farmers, the industry and all Iowans impacted by COVID-19.
15. 2019. *Dean Lee R. Kolmer Award for Excellence in Applied Research*. College of Agriculture and Life Sciences Iowa State University of Science and Technology.

14. 2019. *Iowa State University Award for Outstanding Achievement in Extension or Professional Practice.* Iowa State University of Science and Technology. $1,500.
13. 2019. *Outstanding Achievement in Extension and Outreach Award.* College of Agriculture and Life Sciences Iowa State University of Science and Technology. $500.
12. 2018. *Animal Industry Service Award.* American Society of Animal Science Foundation.
11. 2017. *Certificate of Distinction for Exemplary Service as a Faculty Mentor.* Iowa State University of Science and Technology.
10. 2016. *Mid-Career Achievement in Research.* Iowa State University of Science and Technology. $1,500.
9. 2016. *Mid-Career Achievement in Research Award.* College of Agriculture and Life Sciences Iowa State University of Science and Technology. $500.
8. 2015. *Certificate of Appreciation in Recognition of 10-years of Service to Iowa State University Extension.* Iowa State University of Science and Technology.
7. 2014. *Gamma SIGMA Delate. Extension: Award of Merit.* Iowa State University of Science and Technology.
6. 2013. *RFI (Residual Feed Intake) Team.* Iowa State University of Science and Technology.
5. 2011. *Early Career Award.* American Society of Animal Science Foundation.
4. 2010. *Certificate of Appreciation in Recognition of 5-years of Service to Iowa State University Extension.* Iowa State University of Science and Technology.
3. 2000.*Outstanding Graduate Student Scholarship*. Department of Animal Science and Food Technology awarded the Texas Tech University. $1000.
2. 2000. *Gamma Sigma Delta. High scholarship, outstanding achievement and service.* Texas Tech University.
1. 1996. *European Union Grant.* Scottish School of Agriculture, Edinburgh awarded an E.U. $4,500.

RESEARCH (50% OF APPOINTMENT)

Dr. Butters-Johnson publishes under her maiden name of Johnson
Some publications the author will be A. Johnson and for others it will be A. K. Johnson
Journals have not provided impact factors for 2020
****Notation placed by name that I was serving as major or co-major professor, serving on their Program of Studies Committee (POSC) or was their direct supervisor***
^Notation placed by name that I was serving as Faculty mentor
[#]Notation on publications placed by name, I served as corresponding author

PEER REVIEWED JOURNAL ARTICLES: PROFESSOR (JULY 2018) TO SEVEN-YEAR REVIEW 2024 (N = 29)

122. Meyer, M. M*., **A. K. Johnson**, and E. A. Bobeck^. Laser environmental enrichment and spirulina algae improve broiler growth performance and later myogenic gene expression and *pectoralis major* dimensions. Frontiers in Animal Science. December 2021. DOI: https://doi.org/10.3389/fanim.2021.784294. Impact Factor 5.30. <u>Role:</u> *Creative input into the project, experimental design, writing, review and editorial input into the manuscript.* <u>Significance:</u> *Genetic selection for fast growth rate and high breast muscle yield in modern broilers has unintended effects on animal welfare and behavior, namely in terms of inactivity and leg disorders. We hypothesized that exercise stimulated through environmental enrichment could positively stimulate pen-wide activity and improve bird welfare. The study objectives were to implement a laser enrichment device to motivate active and feeding behaviors throughout the pen.* <u>Supervised:</u> *Dr. Butters-Johnson served on Ms. Meyers PhD Program of Studies Committee.*

121. **Johnson, A#.**, C. Rademacher, J. Eggers, N. Gabler, L, Greiner, J. Kaisand, L. Karriker, S. Millman, J. Patience, B. Ramirez, L. Schulz, S. Webb and J. Ross. 2021. Innovative strategies for managing swine welfare during the COVID-19 pandemic in Iowa. Translational Animal Science. DOI: https://doi.org/10.1093/tas/txab225 Impact Factor 1.24. *Role: Lead- and corresponding author. Identified the sections of the paper, assigned sections to co-authors and oversaw writing deadlines. Significance: Coronavirus Disease 2019 (COVID-19) was declared a global pandemic on March 11, 2020 by the World Health Organization and its impact on animal agriculture in the United States was undeniable. By April, COVID-19 resulted in the simultaneous closure or reduced operations of many meat processing plants in the upper Midwest, leading to supply chain disruptions. In Iowa, the leading pork production and processing state, these disruptions caused producer uncertainty, confusion, and stress, including time-sensitive challenges for maintaining animal care. The Iowa Resource Coordination Center (IRCC) was quickly created and launched from the Iowa Department of Agriculture and Land Stewardship (IDALS). The IRCC included public representation from the Iowa Pork Producers Association (IPPA), Iowa Pork Industry Center (IPIC), and Iowa State University Extension and Outreach, and private partners including producers, veterinarians, and technical specialists. Supporting swine welfare, the IRCC provided information on management strategies, dietary alterations to slow pig growth, alternative markets, on-farm euthanasia, and mass depopulation under veterinary oversight. In a crisis, Iowa created a model that reacted to producers' pragmatic, mental and emotional needs. This model could be quickly replicated with an introduction of a foreign animal disease. Supervised: All co-authors.*
120. Meyer, M. M*., **A. K. Johnson**, and E. A. Bobeck^. Environmental enrichment stimulates broiler laser-following behavior while increasing individual bird locomotion and pen-wide movement. Frontiers in Animal Science. September 2021. DOI: https://doi.org/10.3389/fanim.2021.784408. Impact Factor 5.30. *Role: Creative input into the project, experimental design, writing, review and editorial input into the manuscript. Significance: Genetic selection for fast growth rate and high breast muscle yield in modern broilers has unintended effects on animal welfare and behavior, namely in terms of inactivity and leg disorders. We hypothesized that exercise stimulated through environmental enrichment could positively stimulate pen-wide activity and improve bird welfare. The study objectives were to implement a laser enrichment device to motivate active and feeding behaviors throughout the pen. Supervised: Dr. Butters-Johnson served on Ms. Meyers PhD Program of Studies Committee.*
119. VanValin, K. R., R. N. Carmichael-Wyatt, E. L. Deters*, E. M. Messersmith, K. J. Heiderscheit K. J*, K. G. Hochmuth, T. D. Jackson, J. M. Peschel, **A. K. Johnson**, and S. L. Hansen. 2021. Dietary Zn concentration and lipopolysaccharide injection affect circulating trace minerals, acute phase protein response, and behavior as evaluated by an ear-tag based accelerometer in beef steers. Journal of Animal Science. 99(10):1-10. DOI: https://doi.org/10.1093/jas/skab278 Impact Factor 1.71. *Role: Creative input into the project, experimental design, writing, review and editorial input into the manuscript. Significance: The feedlot receiving period involves many stressors leading to increased disease incidence. The National Animal Health Monitoring System estimates that bovine respiratory disease affects 21.2% of all beef cattle placed in feedlots). Bovine respiratory disease commonly affects cattle during the receiving period, and identifying morbid cattle early may lead to improved animal welfare through decreased morbidity and mortality, and increased treatment efficacy). Use of ear-tag–based accelerometers have been validated to assess time spent ruminating, eating, and activity in healthy dairy and beef cattle. However, less is known about the use of these technologies. for detecting behavior alterations in sick feedlot cattle. Thus, the objective of this study was to assess plasma trace mineral concentrations, the acute phase protein response, and cattle behavior when given various doses of injected Lipopolysaccharide and supplemented with either 30 or 100 mg Zinc/kg DM. Supervised: Dr. Butters-Johnson served on Ms. Deters and Heiderscheit PhD Program of Studies Committees.*
118. Leonard, S. M*., H. Xin, T. Brown-Brandl, B. C. Ramirez, **A. K. Johnson**, S. Dutta, S. and G. A. Rohrer. 2021. Effects of farrowing stall layout and number of heat lamps on and sow piglet behavior. Applied Animal Behavior Science. Applied Animal Behaviour Science. DOI: https://www.sciencedirect.com/science/article/pii/S0168159121001210?via%3Dihub Impact Factor

2.45. *Role: Creative input into the project, experimental design, writing, review and editorial input into the manuscript. Significance: Farrowing stalls are used in the United States swine industry to reduce pre-weaning piglet mortality, enable efficient individual animal management, and decrease facility construction and operating costs. The quantity and quality of space provided for sows and piglets in farrowing stalls are important economic and welfare considerations. The specific objectives were to evaluate the effects of farrowing stall layout and number of heat lamps on: (1) sow lying, sitting, standing, and kneeling, (2) sow postural shifts, (3) sow feeding and drinking, (4) sow udder orientation when lying, and (5) piglet location within the farrowing stall. Results can be used to better understand the implications of space allocation and number of heat lamps on sow and piglet welfare, as well as to guide farrowing stall designs. Supervised: Dr. Butters-Johnson served on Ms. Leonard's PhD Program of Studies Committee.*

117. Robbins, J. A., J.A. Danielson **A. K. Johnson**, R.L. Parsons, M.W. Jorgensen and S.T. Millman. 2021. Attitudes towards animals among first-year veterinary students enrolled in an introductory animal welfare course. Animal Welfare. 30(4):409-418. Impact Factor 1.43. *Role: Creative input into the project, experimental design, writing, review and editorial input into the manuscript. Significance: Social norms regarding animal treatment have changed dramatically during the last 300 years. As a result, the veterinary profession is increasingly looked to for expertise and leadership in addressing animal welfare issues. Understanding veterinary student attitudes towards animals and beliefs about animal mental capacities is important when evaluating a veterinarian's ability to adhere to their oath. Attitudes are considered precursors of behaviour, and empirical research suggests strongly held attitudes about animals depend heavily (if not exclusively) on perceptions of animals' mental capacities. The objective of this study was to we surveyed first-year veterinary students at a Midwestern veterinary college to assess their attitudes towards animals and belief in animal mind (BAM) before and after completing a required animal welfare course. Supervised: Dr. Butters-Johnson was Ms. C. Jacksons Major professor, Dr. Sadler was Dr. Butters-Johnson's technician and Dr. Stambuk was Dr. Johnson's Post-Doctoral Associate.*

116. Jackson, C. J*., **A. K. Johnson**#, K. J. Stalder, R. A. Edler, J. T. Holck, P. R. DuBois, L. A. Karriker, L. J. Sadler*, and C. R. Stambuk*. Drinker to nursery pig ratio: Drinking behavior, aggression, and drinker location preference over 2 days. 2021. Journal of Swine Health and Production. 29(2):81-89. Impact Factor 0.81. *Role: Creative input into the project, experimental design, writing, review and editorial input into the manuscript. Significance: Water function, quality, and quantity are essential to the individual pig's welfare. It has been labelled as the 'forgotten nutrient' due to it receiving less scientific attention than proteins, fats, and carbohydrates in the pig's diet due to fewer scientific publications centered around water. There are few scientifically based and published information regarding water resource location within a pen, pig to drinker ratios, and their effects on pig behavior are lacking. The objective of this study was to determine how 1, 2, or 3 drinkers/pen affected visit numbers and time spent at the drinker, aggressive interactions in the drinker vicinity, drinker location preference, and water disappearance for 7-week-old nursery pigs. Supervised: Dr. Butters-Johnson was Ms. C. Jacksons Major professor, Dr. Sadler was Dr. Butters-Johnson's technician and Dr. Stambuk was Dr. Johnson's Post-Doctoral Associate.*

115. Fordyce, A. L*. J. D. Colpoys*, E. A. Hines, E. M. Edwards, **A. K. Johnson**, J. M. Bundy, K. J. Stalder and H. D. Tyler^. 2021. Measuring birth weight and umbilical cord diameter at birth to predict subsequent performance in swine. Translational Animal Science. 5: 1-9. DOI https://doi.org/10.1093/tas/txaa214 Impact Factor 1.03. *Role: Creative input into the project, experimental design, writing, review and editorial input into the manuscript. Significance: Umbilical hernia incidence and pig market weight are a few contributing factors affecting profitability and welfare on farm. Therefore, the ability to reliably predict any of these outcomes is valuable to swine operations. Mortality during the pre-weaning phase, umbilical hernia incidence and poor-quality finisher pigs can represent a multi-million-dollar loss and increase in welfare concerns to the producer. Consequently, the objective of this study was to evaluate whether birth weight (BW), umbilical cord diameter at birth (UCD), and the calculated umbilical diameter at birth to birth weight ratio*

(UCD:BW), are potential indicators of both placental efficiency and relative defect size in the abdominal musculature as well as reliable predictors of pre-weaning mortality, umbilical hernia incidence, and pig body weight at 150 d of age in a commercial facility. Supervised: Dr. Butters-Johnson served on Dr. Fordyce POSC.

114. Lane, K. J*., **A. K. Johnson**, C. E. J. Stilwill, J. D. Harmon, L. A. Karriker, and K. J. Stalder. 2020. Comparison of heat lamps and heat mats in the farrowing house: effect on piglet production, energy usage and piglet and sow behavior through digital observation. EC Veterinary Science. 5:18-26. Impact Factor 1.34. *Role: Creative input into the project, experimental design, writing, review and editorial input into the manuscript. Significance: At birth, piglets are poorly equipped to deal with the environment outside of the sow. They are especially susceptible to cold stress. Litters can and will huddle and this can effectively increase the thermal insulation and conduction. Once the piglet has huddled and raised its hair, it is up to the caretaker to provide warm, dry bedding or even additional heat. In conventional systems, caretakers can provide the piglets with supplemental heat sources (lamps and mats) to try and keep the piglets warm and away from their mother to reduce pre-weaning mortality. Pre-weaning mortality in the United States continues to rise and at a 20% pre-weaning mortality level has been estimated to cost $400- to $600 million annually. This timely work provided an in-depth holistic production welfare approach using state of the art heat lamps and mats. In addition, a detailed cost computation for these two heat sources was completed. Supervised: Dr. Butters-Johnson served as the co-major professor for Miss Lane.*
113. Stambuk, C. R*., L. J. Sadler*, P. R. DuBois, R. A. Edler, J. T. Holck, C. J. Jackson*, L. A. Karriker. K. J. Stalder and **A. K. Johnson**#. 2020. More nipple cup drinkers to fewer pigs on the day of weaning into a conventional nursery results in reduced aggression and more visits to the drinker. Journal of Animal Sciences and Livestock Production. 4:6 doi 10.36648/2577-0594.4.1.3. Impact Factor 0.84. *Role: Creative input into the experimental design, writing, review and editorial input into the manuscript. Significance: Water has often been defined as the "forgotten nutrient" As pigs have grown and become more efficient key resources in the pen have been grossly overlooked. In addition, weaning is a very stressful time for the pig. Supervised: Dr. C. Stambuk, Post-Doctoral mentor. Dr. L. Sadler, Agricultural Research Technician and Ms. C. Jackson, Masters major professor.*
112. **Johnson, A. K#.,** A. Garcia, L. A. Karriker and K. J. Stalder. 2020. Sow lateral toe growth and lesion presence on hooves when housed in gestation stalls. Journal of Animal Sciences and Livestock Production. 4:1:3:1-7. DOI: 10.36648/2577-0594.4.1.3 Impact Factor 0.84. *Role: Creative input into the experimental design, writing, review and editorial input into the manuscript. Significance: The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides on-farm practical tools to provide comfort to sows whilst experiencing lameness.*
111. Mumm J. M*., J. A. Calderón Díaz, J. D. Stock*, **A. K. Johnson**, A. Ramirez, S. Azarpajouh*, and K. J. Stalder. 2020. Characterization of the lying and rising sequence in lame and non-lame sows. Applied Animal Behaviour Science. 226: doi 104976. Impact Factor 2.19. *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript. Significance: Determining the space envelope for gilts and sows (static and dynamic space needs) is critical for the U.S. swine industry when they are updating their programs and providing recommendations to producers. In addition, stakeholders who buy pork product are interested in the amount of space sows and gilts have on-farm and these resource-based measures are measured during third party audit programs. This work provides producers information on the benefits of selecting for a more efficient pig. Supervised: Served on Mr. Mumm's POSC committee.*
110. Novack, B. L., J. M. Young, D. J. Newman, **A. K. Johnson**, and S. A. Wagner. 2020. A ramp in nursery housing affects nursery pig behavior and speeds market pig loading. Applied Animal Science. 36:574-581. Impact factor 2.19. *Was selected for Editor's Choice for the Journal Issue. Role: Creative input into the experimental design, writing, review and editorial input into the manuscript. Significance: Transport losses include pigs that die or become injured or non-ambulatory during any stage of marketing. It is estimated that transport losses affect up to 1% of all marketed pigs. In the*

United States, over 124 million hogs were slaughtered in 2018, so more than one million pigs may be classified as a transport loss each year in the Unites States. During marketing, pigs are subjected to internal and external stressors. If the stress level exceeds the body's capacity to cope in a reasonable period, the pigs' welfare is compromised, resulting in a pig being classified as a transport loss. Typically, pigs have little or no exposure to many aspects of loading, handling and transport prior to the time of marketing, including walking up and down ramps. We hypothesized that by reducing the novelty of ramps through exposure of pigs to a ramp prior to marketing, loading during the marketing process could be made faster and easier.

109. Akin, E. E*., **A. K. Johnson**#, C. D. Jass, S. T. Millman, K. J. Stalder, J. P. Stinn, and J. W. Ross. 2020. Alternative handling tools for moving grow-finish pig cadavers: A pilot study. Journal of Swine Health and Production. 28:125-134. Impact factor 0.28. *Role: Creative input into the experimental design and wrote the grant, writing, review and editorial input into the manuscript. Significance: The National Pork Board (NPB) provides swine handling recommendations and humane handling tools to move both ambulatory and non-ambulatory pigs through their Pork Quality Assurance program and Transport Quality Assurance program. Building on these educational programs, the Common Swine Industry Audit (CSIA) requires for humane handling under Willful Acts of Abuse or Neglect; Movement of non-ambulatory pigs. The CSIA specifically notes, "Dragging of conscious animals by any part of their body except in the rare case where a non-ambulatory animal must be moved for a life-threatening situation. Non-ambulatory pigs may be moved by using a drag mat." If an auditor witnesses a concious non-ambulatory pig being dragged by any body part, the farm will automatically fail the auditd scientific knowledge in the literature that provides producers with effective handling tools for moving a non-ambulatory grow-finish pig on-farm that accounts for caretaker safety and pig welfare. Supervised: Major Professor for Miss. Akin.*
108. Lane, K*., **A. K. Johnson**, C. Stilwill, L. A. Karriker, J. D. Harmon and K. J. Stalder. 2020. Comparison of heat lamps and heat mats in the farrowing house: effect on piglet production, energy usage and piglet and sow behavior through live observation. Journal of Swine Health and Production. 28:205-212. Impact factor 0.30. *Role: Creative input into the project, experimental design, writing, review and editorial input into the manuscript. Significance: At birth, piglets are poorly equipped to deal with the environment outside of the sow. They are especially susceptible to cold stress. Litters can and will huddle and this can effectively increase the thermal insulation and conduction. Once the piglet has huddled and raised its hair, it is up to the caretaker to provide warm, dry bedding or even additional heat. In conventional systems, caretakers can provide the piglets with supplemental heat sources (lamps and mats) to try and keep the piglets warm and away from their mother to reduce pre-weaning mortality. Pre-weaning mortality in the United States continues to rise and at a 20% pre-weaning mortality level has been estimated to cost $400- to $600 million annually. This timely work provided an in-depth holistic production welfare approach using state of the art heat lamps and mats. In addition, a detailed cost computation for these two heat sources was completed. Supervised: Dr. Butters-Johnson served as the co-major professor for Miss Lane.*
107. Meyer, M. M*., **A. K. Johnson**, and E. A. Bobeck^. 2019. A novel environmental enrichment device increased physical activity and walking distance in broilers. Poultry Science. 99:48-60. Impact factor 2.03. *Role: Creative input into the grant, experimental design, writing, review and editorial input into the manuscript. Significance: Broiler lameness is a recognized welfare issue. Previous work in broiler enrichment has been unsuccessful. By using the birds naturally foraging behavior we successfully stimulated bird movement and improved overall welfare. This work has resulted in a patent. Supervised: Dr. Butters-Johnson served on Miss Meyer's POSC.*
106. Meyer, M. M*., **A. K. Johnson**, and E. A. Bobeck^. 2019. A novel environmental enrichment device improved broiler performance without sacrificing bird physiological or environmental quality measures. Poultry Science. 98(11): 5247-5256. Impact factor 2.03. *Role: Creative input into the grant, experimental design, writing, review and editorial input into the manuscript. Significance: Broiler lameness is a recognized welfare issue. Previous work in broiler enrichment has been unsuccessful. By using the birds naturally foraging behavior we successfully stimulated bird movement and improved*

overall welfare. This work has resulted in a patent. Supervised: Dr. Butters-Johnson served on Miss Meyer's POSC.

105. Meyer, M. M*., **A. K. Johnson** and E. A. Bobeck^. 2018. Development and validation of broiler welfare assessment methods for research and on-farm audits. Journal of Applied Animal Welfare Science. DOI 10.1080/10888705.2019.1678039. Impact factor 0.61. *Role: Creative input into the grant, experimental design, writing, review and editorial input into the manuscript. Significance: Broiler lameness is a recognized welfare issue. Previous work in broiler enrichment has been unsuccessful. By using the birds naturally foraging behavior we successfully stimulated bird movement and improved overall welfare. This work has resulted in a patent. Supervised: Dr. Butters-Johnson served on Miss Meyer's POSC.*
104. Akin, E. E*., **A. K. Johnson**#, S. T. Millman, C. D. Jass, K. J. Stalder J. P. Stinn, and J. W. Ross. 2019. Modified wean-to-finish mat as an alternative handling tool for moving grow-finish pig cadavers: A pilot study. Journal of Swine Health and Production. 27(5). 278-283. Impact factor 0.30. *Role: Creative input into the experimental design and wrote the grant, writing, review and editorial input into the manuscript. Significance: The National Pork Board (NPB) provides swine handling recommendations and humane handling tools to move both ambulatory and non-ambulatory pigs through their Pork Quality Assurance program and Transport Quality Assurance program. Building on these educational programs, the Common Swine Industry Audit (CSIA) requires for humane handling under Willful Acts of Abuse or Neglect; Movement of non-ambulatory pigs. The CSIA specifically notes, "Dragging of conscious animals by any part of their body except in the rare case where a non-ambulatory animal must be moved for a life-threatening situation. Non-ambulatory pigs may be moved by using a drag mat." If an auditor witnesses a concious non-ambulatory pig being dragged by any body part, the farm will automatically fail the auditd scientific knowledge in the literature that provides producers with effective handling tools for moving a non-ambulatory grow-finish pig on-farm that accounts for caretaker safety and pig welfare. Supervised: Major Professor for Miss. Akin.*
103. **Johnson, A. K#.,** J. D. Colpoys, A. Garcia, C. Jass, S. T. Millman, M. D. Pairis-Garcia, C. J. Rademacher, S. L. Weimer and S. Azarpajouh*. 2019. A proactive blueprint to demonstrate on-farm animal welfare. CAB Reviews. 14(037). 1-8. This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: This review was created to provided producers a guideline document on how to create or improve their on-farm welfare programs. Dr. Johnson completed the literature review, wrote the paper, made co-author editorial changes and responded to the external reviewers. Significance: On-farm animal welfare is a consumer and customer concern. It is imperative that producers remain in compliance with their marketing specifications, global trade needs and legislation at both the state, federal or country levels.*
102. McNeil B. M., K. J., Stalder, J. A. Calderón-Diaz, J. D. Stock, T. D. Parsons*, D. L. Beam, **A. K. Johnson**, C. E. Bruns, and J. B. Niemi. 2019. Development of sow lameness classification tress using an embedded microcomputer-based Force Plate in a commercial setting. Journal of Animal Sciences and Livestock Production. 2;1-6. DOI: 10.21767/2577-0594.10006. Impact factor 0.84. *Role: Creative input into the experimental design, writing, review and editorial input into the manuscript. Significance: The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides on-farm practical tools to provide comfort to sows whilst experiencing lameness.*
101. Bundy, J. M^., J. A. Sterle, **A. K. Johnson**, and G. T. Krahn. 2019. The impact of an introductory animal handling course on undergraduate students who lack pervious livestock handling experience. Journal of Animal Science. DOI: 10.1093/jas/skz095. Impact factor 0.42. *Role: Creative input into the experimental design, writing, review and editorial input into the manuscript. Significance: A majority of Animal Science undergraduates have limited livestock handling experience when they come to college. To address this issue, a course based on livestock handling, safety and welfare was*

implemented in the Department of Animal Science at Iowa State University. Supervised: Dr. Butters-Johnson serves as Dr. Bundy's official mentor.

100. Colpoys, J*., D. Van Sambeek, C. Bruns, **A. K. Johnson**, J. Dekkers, F. Dunshea and N. Gabler. 2019. Responsiveness of swine divergently selected for feed efficiency to exogenous adrenocorticotropin hormone (ACTH) and glucose challenges. Domestic Animal Endocrinology. 68:32-38. Impact factor 2.30. *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript. Significance: Feed is the largest cost on farm (50 to 75%). Identifying pigs that eat less, but grow as quickly would be a very beneficial selection tool for the U.S. swine industry. This work provides producers information on the benefits of selecting for a more efficient pig. Co-Supervised: Co-major Professor for Dr. Colpoys.*
99. Mumm, J. M*., J. A. Calderón-Diaz, J. D. Stock*, **A. K. Johnson**, J. C. Dekkers, A. Ramirez, S. Azarpajouh*, and K. J. Stalder. 2019. Dynamic space utilization for lame and non-lame gestating sows estimated by the lying-standing sequence. Livestock Science. 223:1-7. Impact factor 1.34. *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript. Significance: Determining the space envelope for gilts and sows (static and dynamic space needs) is critical for the U.S. swine industry when they are updating their programs and providing recommendations to producers. In addition, stakeholders who buy pork product are interested in the amount of space sows and gilts have on-farm and these resource-based measures are measured during third party audit programs. This work provides producers information on the benefits of selecting for a more efficient pig. Supervised: Served on Mr. Mumm's POSC committee.*
98. McNeil, B. M., J. A. Calderón Díaz, C. E. Bruns, J. D. Stock, S. T. Millman, **A. K. Johnson**, L. A. Karriker, K. J. Stalder. 2018. Determining the Time Required to Detect Induced Sow Lameness Using an Embedded Microcomputer-Based Force Plate System. American Journal of Veterinary Research DOI: http://doi.org/10.3844/ajavsp.2018. Impact factor 1.0. *Role: Creative input into the experimental design, writing, review and editorial input into the manuscript. Significance: The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides on-farm practical tools to provide comfort to sows whilst experiencing lameness.*
97. Azarpajouh, S*., A. Garcia, C. Jackson*, L. Karriker, A. S. Ramirez and **A. Johnson**. 2018. The importance of water in pig production: a review. CAB Reviews. 13: 1-7. This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: This review was built from a previous Master's thesis (Jackson) whom I majored. Dr. Azarpajouh was charged with updating the literature review. Together we edited and wrote the review paper. Significance: Water is often considered the forgotten nutrient on-farm, but a lack of clean water can result in illness and death for pigs. This review provides up to date information for swine producers to consider when it comes to water management on-farm. Supervised: Dr. Azarpajouh.*
96. Supakorn, C., J. D. Stock, E. Garay, **A. K. Johnson** and K. J. Stalder. 2018. Lameness: a principle problem to sow longevity in breeding herds. CAB Reviews. 13:1-14. http://www.cabi.org/cabreviews *Role: Assistance in a through literature review, reviewing the manuscript and assisting with reviewer comments. Significance: The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides on-farm practical tools to provide comfort to sows whilst experiencing lameness.*
95. Iske, C. J*., C. L. Morris, J. D. Colpoys and **A. K. Johnson**[#]. 2018. Nutrient evaluation of a pork by-product and its use as environmental enrichment for managed large exotic cats. PLos One. https://doi.org/10.1371/journal.pone.0202144. This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: Creative input into the tiger work, statistical modelling, writing, review and editorial input into the manuscript. Significance: There is increased interest in zoo animal welfare. Large cats are often fed a soft diet and this is negatively affecting their dental health. This work provides Association of Zoos and Aquariums and other stakeholder's information on the benefits of enrichment,*

which is cost efficient and does not compromise conservation and breeding effects. Co-Supervised: On Ms. Iske's, MS committee.

94. Colpoys, J. D*., **A. K. Johnson**, and N. K. Gabler. 2018. The efficacy of novel rope flavors as environmental enrichment for stalled gilts. Animal Welfare. 27: 351-356. Impact factor 1.5. *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript. Significance: There is increased interest in on-farm and laboratory enrichment that can improve swine welfare. This work provides stakeholders information on the benefits of enrichment, which is cost efficient and does not compromise the research aims or production effects. Co-Supervised: Co-major Professor for Dr. Colpoys.*

PEER REVIEWED JOURNAL ARTICLES: P & T REVIEW (OCTOBER 2010 TO JUNE 2011), ASSOCIATE PROFESSOR TO FULL PROFESSOR SUBMISSION (N = 60)

93. Mullins, C., M. Campler, R. Anthony, **A. Johnson**, G. Coleman, and J. L. Rault. 2018. The development of an interactive computer-based training program for timely and humane on-farm pig euthanasia. Journal of Veterinary Medical Education. 45:405-412. Impact factor 0.70 (ranking 44/127; Veterinary Sciences). *Role: Creative input into the funded grant, writing, review and editorial input into the manuscript and input into addressing reviewer comments. Significance: The National Pork Board has identified on-farm euthanasia as a critical research area and the Common Swine Industry Audit has identified euthanasia in four critical questions that can fail a farm. This body of work will provide a training tool for caretakers.*
92. Weimer, S. L*, T. J. Fangman, L. A. Karriker, K. J. Stalder and **A. K. Johnson**#. 2018. Nursery pig behavior evaluation pre- and post-injection using digital-image methodology. Journal of Swine Health and Production. 26: 25-33. Impact factor 0.98 (ranking 95/127; Veterinary Sciences). *Role: Wrote the grant to fund the project, oversaw the research project, had creative input into the statistical modelling, review and editorial input into the manuscript. Significance: The U.S. Swine industry conducts on-farm welfare assessments and third-party audits. There has been interest in designing an objective human-animal interaction test. This work provides methodology information for on-farm application for a human-animal interaction test. Supervised: Major Professor for Ms. Weimer.*
91. Mullins, C. R., M. D. Pairis-Garcia, K. A. George, R. Anthony, **A. K. Johnson**, G. J. Coleman, J-L. Rault and S. T. Millman. 2017. Determination of swine euthanasia criteria and analysis of barriers to euthanasia in the United States using expert opinion. Animal Welfare. 26:449-459. Impact factor 1.57 (ranking 39/127; Veterinary Sciences). *Role: Creative input into the funded grant, writing, review and editorial input into the manuscript and input into addressing reviewer comments. Significance: The National Pork Board has identified on-farm euthanasia as a critical research area and the Common Swine Industry Audit has identified euthanasia in four critical questions that can fail a farm. This body of work will provide a training tool for caretakers.*
90. Rauw, W. M., **A. K. Johnson**, L. Gomez Raja and J. C. M. Dekkers. 2017. The relationship between selection for improved production efficiency in livestock production, coping behavior and domestication. Frontiers in Genetics. 8:134. DOI: 10.3389/fgene.2017.00134 Impact factor 4.15 (ranking 24/113; Genetics and Heredity Science). *Role: Creative input finding literature on the behavior of the fatigued pig, writing, review and editorial input into the manuscript and input into addressing reviewer comments. Significance: Concern has been expressed that selection for animals based only on production has led to unintended welfare implications for livestock. This review paper compares and contrasts different selection programs, copying styles and livestock temperament. This review paper will be a fundamental resource/citation for future work in this area.*
89. Ritter, M. J. **A. K. Johnson**, M. E. Benjamin, S. N. Carr, M. Ellis, L. Faucitano, T. Grandin, J. L. Salak-Johnson, D. U. Thomson, M. S. Calvo-Lorenzo, and C. Goldhawk. 2017. Review: Effects of Ractopamine Hydrochloride (Paylean) on welfare indicators for market weight pigs. Translational Animal Science. 1(4). 533-558. This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: Creative input finding literature on the behavior of the fatigued pig, writing, review and editorial input into the manuscript and input into addressing reviewer comments.*

88. Parsons R. L*., **A. K. Johnson**#, J. F. Coetzee, L. A. Karriker, M. D. Pairis-Garcia, K. J. Stalder and S. T. Millman. 2016. Flooring preference and behavior in sound and lame sows. Acta Animal A. 66:115-118. Impact factor 1.92 (ranking 5/58; Agriculture, Dairy and Animal Science). Role: *Creative input into the funded grant, assistance in live sow work, statistical modelling, writing, review and editorial input into the manuscript and was the lead in addressing reviewer comments.* Significance: *The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides on-farm practical tools to provide comfort to sows whilst experiencing lameness.* Supervised: *Mrs. R. Parsons, Technician.*
87. Roca, A*., **A. K. Johnson**#, L. A. Karriker, L. L. Timms, C. E. Abell, and K. J. Stalder. 2016. How do sow postures change when lameness is induced using a chemical synovitis model? Livestock Science. 192:55-59. Impact factor 1.38 (ranking 17/58; Agriculture, Dairy and Animal Science). Role: *Creative input into the funded grant, assistance in live sow work, statistical modelling, writing, review and editorial input into the manuscript and was the lead in addressing reviewer comments.* Significance: *The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides an on-farm practical behavioral tool to help caretakers identify lame sows early.* Supervised: *Major Professor for Ms. Roca.*
86. Pairis-Garcia, M. D. **A. K. Johnson**, S. Azarpajouh*, J. D. Colpoys, C. J. Rademacher, S. T. Millman, and S. R. Webb. 2016. The U.S. swine industry; historical milestones and the future of an-farm swine welfare assessments. CAB Reviews. No. 025. This journal has not yet been awarded an impact factor within a discipline by ISI. Role: *CAB editorial board invited Dr. Johnson to identify the writing team. Creative input into writing, review and editorial input into the manuscript.* Significance: *The U.S. swine industry since 2000 has evolved tremendously regrading swine welfare. This review papers provides that historical changes that have occurred as well as predicts what the future welfare challenges will be.*
85. Robinson, A. L*., J. D. Colpoys, G. D. Robinson, E. A. Hines, L. L. Timms, K. J. Stalder, **A. K. Johnson**, and E. M. Edwards. 2016. The effect of antiseptic compounds on umbilical cord healing and infection rates in piglets from a commercial facility. Journal of Swine Health and Production. 24:212-215. Impact factor 0.56 (ranking 95/136; Veterinary Sciences). Role: *Creative input into the statistical modelling, review and editorial input into the manuscript.* Significance: *The National Pork Board has identified animal care and health for the newborn piglet as a critical research area. This body of work will provide medical options at the time of processing to assist in wound care and healing.* Supervised: *Served on Ms. Robinsons POSC.*
84. Whalin, L., M. Pairis-Garcia, K. Proudfoot, K. Stalder and **A. Johnson**. 2016. Validating behavioral sampling techniques for lame sows administered flunixin meglumine and meloxicam. Livestock Science. 191:103-107. Impact factor 1.38 (ranking 17/58; Agriculture, Dairy and Animal Science). Role: *Creative input into the funded grant, assistance in live sow work, statistical modelling, writing, review and editorial input into the manuscript.* Significance: *The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides swine veterinarians pharmacological tools and behavioral sampling to help identify and effectively treat lame sows.*
83. Colpoys, J. D*., **A. K. Johnson** and N. K. Gabler. 2016. Feeding regimen impacts on pig growth and behavior. Physiology and Behavior. 159:27-32. Impact factor 2.34 (ranking 30/51; Behavioral Sciences). Role: *Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript.* Significance: *Feed is the largest cost on farm (50 to 75%). Identifying pigs that eat less, but grow as quickly would be a very beneficial selection tool for the U.S. swine industry. This work provides producers information on the benefits of selecting for a more efficient pig.* Co-Supervised: *Co-major Professor for Dr. Colpoys.*
82. Campler, M., M. Pairis-Garcia, K. J. Stalder and **A. K. Johnson**. 2016. Tips and techniques on rubber mat placement in a swine farrowing and lactation facility. Journal of Swine Health and Production.

24:142-146. Impact factor 0.56 (ranking 95/136; Veterinary Sciences). Role: *Creative input into the funded grant, statistical modelling, writing, review and editorial input into the manuscript.* Significance: *The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides an on-farm practical behavioral tool to help caretakers provide a management tool to provide comfort to a lame sow during farrowing and lactation.*

81. Parsons, R. L*., **A. K. Johnson**#, J. F. Coetzee, L. A. Karriker, C. M. Mohling, M. D. Pairis-Garcia, K. J. Stalder, and S. T. Millman. 2015. Sow behavioral responses to transient, chemically-induced synovitis lameness. Acta Agriculture. Scandavian A. Animal Science. DOI: http://www.tandfonline.com/doi/full/10.1080/09064702.2015.1110617. Impact factor 0.77 (ranking 48/58; Agriculture, Dairy and Animal Science). Role: *Creative input into the funded grant, assistance in live sow work, statistical modelling, writing, review and editorial input into the manuscript.* Significance: *The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides an on-farm practical behavioral tool to help caretakers identify sows earlier. Supervised: Mrs. R. Parsons, Technician. .*
80. Pairis-Garcia, M. D*., **A. K. Johnson**, C. A. Abell, J. F. Coetzee, L. A. Karriker, S. T. Millman and K. J. Stalder. 2015. Measuring the efficacy of flunixin meglumine and meloxicam for lame sows using a GAITFour pressure mat and an embedded microcomputer-based force plate system. Journal of Animal Science. 93:2100-2110. Impact factor 2.01 (ranking 8/58; Agriculture, Dairy and Animal Science). Role: *Creative input into the funded grant, assistance in live sow work, statistical modelling, writing, review and editorial input into the manuscript.* Significance: *The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides an on-farm practical biomechanical- and pharmacological tools to help swine veterinarians and caretakers identify sows earlier.* Supervised: *Major Professor for Dr. Pairis-Garcia.*
79. Pairis-Garcia, M. D*., **A. K. Johnson**#, K. J. Stalder, C. A. Abell, L. A. Karriker and J. F. Coetzee and S. T. Millman. 2015. Behavioural evaluation of analgesic efficacy for pain mitigation in lame sows. Animal Welfare. 24:93-99. Impact factor 0.82 (ranking 38/136; Veterinary Sciences). Role: *Creative input into the funded grant, assistance in live sow work, statistical modelling, writing, review and editorial input into the manuscript.* Significance: *The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides an on-farm practical behavioral- and pharmacological tools to help swine veterinarians and caretakers identify sows earlier.* Supervised: *Major Professor for Dr. Pairis-Garcia.*
78. Colpoys, J. D*., N. K. Gabler, C. Abell, A. F. Keating, S. T. Millman, J. M. Siegford, and **A. K. Johnson**#. 2015, Feed efficiency effects on barrow and gilt behavioral reactivity to novel stimuli tests. Journal of Animal Science. 93:1267-1275. Impact factor 2.01 (ranking 8/58; Agriculture, Dairy and Animal Science). Role: *Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript.* Significance: *Feed is the largest cost on farm (50 to 75%). Identifying pigs that eat less, but grow as quickly would be a very beneficial selection tool for the U.S. swine industry. This work provides producers information on the benefits of selecting for a more efficient pig.* Co-Supervised: *Co-major Professor for Dr. Colpoys.*
77. Sadler L. J.*, **A. K. Johnson**#, D. Nettleton, C. R. G. Lewis, J. M. Young, S. M. Lonergan, and J. C. M. Dekkers. 2015. The effect for residual feed intake on scale activity and exit score in Yorkshire gilts. Animal Production Science. Impact factor 0.90 (ranking 77/156; Agriculture, Multidisciplinary). DOI.org/10.1071/AN14849. Role: *Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript.* Significance: *Feed is the largest cost on farm (50 to 75%). Identifying pigs that eat less, but grow as quickly would be a very beneficial selection tool for the U.S. swine industry. This work provides producers information on the benefits of selecting for a more efficient pig.* Supervised: *Major Professor for Mr. Sadler.*

76. Pairis-Garcia, M. D*., **A. K. Johnson**, B. Kukanich, L. Wulf, S. T. Millman, K. J. Stalder, L. A. Karriker and J. F. Coetzee. 2014. Pharmacokinetics of meloxicam in mature swine after intravenous and oral administration. Journal of Veterinary Pharmacology and Therapy. DOI 10.111?jvp.12170. Impact factor 1.12 (ranking 45/136; Veterinary Sciences). *Role: Creative input into the funded grant, assistance in live sow work, statistical modelling, writing, review and editorial input into the manuscript. Significance: The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides an on-farm practical behavioral- and pharmacological tools to help swine veterinarians and caretakers identify sows earlier. Supervised: Major Professor for Dr. Pairis-Garcia.*
75. Dzikamunhenga, R. S. R. Anthony, J, R. S., Coetzee, S. Gould, **A. Johnson**, L. Karriker, J. McKean, S.T. Millman, S. R. Niekamp and A. M. O'Connor. 2014. Pain management in the neonatal piglet during routine management procedures. Part 1: a systematic review of randomized and non-randomized intervention studies. Animal Health Research Reviews. 15: 14-38. Impact factor 1.50 (ranking 66/136; Veterinary Sciences). *Role: Dr. Butters-Johnson was invited to attend the National Pork Boards workshop to address neonatal pain management. Prior to the meeting, attendees were assigned 10 papers to review and score using a predetermined matrix from Dr. O'Connor. Dr Butters-Johnson attended a three day in person meeting that used the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) process. Writing, review and editorial input was also completed. Significance: Neonatal pain management is a research area for the National Pork Board, in addition stakeholders (Tyson, Walmart and Target) have identified that practices conducted on the piglet should occur with pain mitigation.*
74. O'Connor, A., R. Anthony, L. Bergamasco, J. Coetzee, S. Gould, **A. K. Johnson**, L. A. Karriker, J. N. Marchant-Forde, G. S. Martineau, J. McKean, S. T. Millman, S. Niekamp, E. A. Pajor, K. Rutherford, M. Sprague, M. Sutherland, E. von Borell, and, R. S. Dzikamunhenga. 2014. Pain management in the neonatal piglet during routine management procedures. Part 2: Grading the quality of evidence and the strength of recommendations. Animal Health Research Reviews. 15: 39-62. Impact factor 1.50 (ranking 66/136; Veterinary Sciences). *Role: Dr. Butters-Johnson was invited to attend the National Pork Boards workshop to address neonatal pain management. Prior to the meeting, attendees were assigned 10 papers to review and score using a predetermined matrix from Dr. O'Connor. Dr Butters-Johnson attended a three day in person meeting that used the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) process. Writing, review and editorial input was also completed. Significance: Neonatal pain management is a research area for the National Pork Board, in addition stakeholders (Tyson, Walmart and Target) have identified that practices conducted on the piglet should occur with pain mitigation.*
73. Colpoys, J. D*., N. K. Gabler, C. Abell, A. F. Keating, S. T. Millman, J. M. Siegford, and **A. K. Johnson**[#]. 2014. Effects of genetic selection for residual feed intake on barrow behavioral responsiveness to novel stimuli tests. Applied Animal Behaviour Science. 159:34-40. Impact factor 1.70 (ranking 10/58; Agriculture, Dairy and Animal Science). *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript. Significance: Feed is the largest cost on farm (50 to 75%). Identifying pigs that eat less, but grow as quickly would be a very beneficial selection tool for the U.S. swine industry. This work provides producers information on the benefits of selecting for a more efficient pig. Co-Supervised: Co-major Professor for Dr. Colpoys.*
72. Kephart, R*., **A. Johnson**[#], A. Sapkota, K. Stalder and J. McGlone. 2014. Establishing bedding requirements on trailers transporting market weight pigs in warm weather. Animals. 4:476-493. This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: The National Pork Board has identified that handling and transportation of pigs is a major research area. Information from this*

research project appears in the Pork Quality Assurance Plus- and the Transport Quality Assurance programs. Supervised: Major Professor for Ms. Kephart.

71. McGlone, J., **A. Johnson,** A. Sapkota, and R. Kephart*. 2014. Temperature and relative humidity inside trailers during finishing pig loading and transport in cold and mild weather. Animals. 4:583-598. This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: The National Pork Board has identified that handling and transportation of pigs is a major research area. Information from this research project appears in the Pork Quality Assurance Plus- and the Transport Quality Assurance programs. Supervised: Major Professor for Ms. Kephart.*
70. McGlone, J., A. Sapkota, **A. Johnson** and R. Kephart*. 2014. Establishing trailer ventilation (boarding) requirements for finishing pigs during transport. Animals. 4:515-523. This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: The National Pork Board has identified that handling and transportation of pigs is a major research area. Information from this research project appears in the Pork Quality Assurance Plus- and the Transport Quality Assurance programs. Supervised: Major Professor for Ms. Kephart.*
69. McGlone, J., **A. Johnson,** A. Sapkota, and R. Kephart*. 2014. Establishing bedding requirements during transport and monitoring skin temperature during cold and mild seasons after transport for finishing pigs. Animals. 4:241-253. This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: The National Pork Board has identified that handling and transportation of pigs is a major research area. Information from this research project appears in the Pork Quality Assurance Plus- and the Transport Quality Assurance programs. Supervised: Major Professor for Ms. Kephart.*
68. Mack, L. A*., D. C. Lay Jr., S. D. Eicher, **A. K. Johnson**, B. T. Richert, and E. A. Pajor. 2014. Group space allowance has little effect on sow health, productivity, or welfare in a free-access stall system. Journal of Animal Science. 92:2554-2567. Impact factor 2.11 (ranking 8/58; Agriculture, Dairy and Animal Science). *Role: Writing, review and editorial input into the manuscript. Significance: The National Pork Board has identified gestation sow housing is a major research area. Information from this research project appears can provide data for producers either retrofitting or building group housing for their sows. Supervised: Served on Dr. Mack's POSC.*
67. Mohling C. M.*, **A. K. Johnson**#, J. F. Coetzee, L. A. Karriker, C. E. Abell, S. T. Millman, and K. J. Stalder. 2014. Kinematics as objective tools to evaluate lameness phases in multiparous sows. Livestock Science. 165:120-128. Impact factor 1.17 (ranking 17/58; Agriculture, Dairy and Animal Science). *Role: Creative input into the funded grant, assistance in live sow work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides an on-farm kinematic tools to help swine veterinarians and caretakers identify sows earlier. Supervised: Major Professor for Ms. Mohling.*
66. Pairis-Garcia, M. D*., **A. K. Johnson,** and S.T. Millman. 2014. Case study: Treatment of oral and locomotory stereotypic behaviors in a mature sow. Journal of Veterinary Behavior. 9:269-273. Impact factor 0.96 (ranking 36/136; Veterinary Sciences). *Role: Creative input into the funded grant, assistance in live sow work, statistical modelling, writing, review and editorial input into the manuscript. Significance: Stereotypies are defined as invariant behavioral sequences with no apparent goal. Stereotypies negatively affect animal welfare. This work helps laboratory animal specialists address stereotypies within a University system. Supervised: Major Professor for Dr. Pairis-Garcia.*

65. Pairis-Garcia, M. D*., **A. K. Johnson,** K. Stalder, L. Karriker, J. Coetzee, and S. T. Millman. 2014. Measuring the efficacy of flunixin meglumine and meloxicam for lame sows using nociceptive threshold tests. Animal Welfare. 23:219-229. Impact factor 1.31 (ranking 38/136; Veterinary Sciences). *Role: Creative input into the funded grant, assistance in live sow work, statistical modelling, writing, review and editorial input into the manuscript. Significance: The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides an on-farm nociceptor threshold tools to help swine veterinarians and caretakers identify sows earlier. Supervised: Major Professor for Dr. Pairis-Garcia.*
64. Mohling C. M.*, **A. K. Johnson**, J. F. Coetzee, L. A. Karriker K. J. Stalder, C. E. Abell, H. D. Tyler and S. T. Millman. 2014. Evaluation of mechanical and thermal nociception as objective tools to measure painful and non-painful lameness phases in multiparous sows. Journal of Animal Science. 92:3073-3081. Impact factor 2.11 (ranking 8/58; Agriculture, Dairy and Animal Science). *Role: Creative input into the funded grant, assistance in live sow work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides on-farm nociceptor threshold tools to help swine veterinarians and caretakers identify sows earlier. Supervised: Major Professor for Ms. Mohling.*
63. Kephart, R*., **A. Johnson**[#], A. Sapkota, K. Stalder and J. McGlone. 2014. Establishing sprinkling requirements on trailers transporting market weight pigs in warm and hot weather. Animals. 4:164-183. This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: The National Pork Board has identified that handling and transportation of pigs is a major research area. Information from this research project appears in the Pork Quality Assurance Plus- and the Transport Quality Assurance programs. Supervised: Major Professor for Ms. Kephart.*
62. Morine, S. J., M. E. Drewnoski, **A. K. Johnson**, and S. L. Hansen. 2014. Determining the influence of dietary roughage concentration and source on rumen parameters related to sulfur toxicity. Journal of Animal Science. 92:4068-4076. Impact factor 2.11 (ranking 8/58; Agriculture, Dairy and Animal Science). *Role: Creative input into the ethogram and behavioral training of the Post-Doc and graduate student. Assisted with the behavioral statistical modelling, writing, review and editorial input into the manuscript. Significance: The Beef Industry continues to seek out different ingredients to use in their dietary formulation. However, how roughage influences the production of Sulphur remains unclear. This work provides data on roughage inclusion and the effects of sulfur toxicity on beef cattle.*
61. Weimer, S. L*., T. J. Fangman, H. D. Tyler, L. A. Karriker, K. J. Stalder and **A. K. Johnson**[#]. 2014. Comparison of nursery pig behavior when using live observation and digital image evaluation methodologies. Journal of Swine Health and Production. 22:116-124. Impact factor 1.21 (ranking 95/136; Veterinary Sciences). *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: The U.S. Swine industry conducts on-farm welfare assessments and third-party audits. There has been interest in designing an objective human-animal interaction test. This work provides methodology information for on-farm application for a human-animal interaction test. Supervised: Major Professor for Ms. Weimer.*
60. Soso*, S. B., J. A. Koziel, **A. K. Johnson**, and S. Fairbanks. 2014. Chemical and sensory characterization of scent markings in wild mammals: A systemic review. Sensors. 14:4428-4465. Impact factor 2.26 (ranking 49/202; Chemistry Analytic). *Role: Creative input into manuscript writing and review. Significance: The use of semi-chemicals and pheromones to keep wild carnivores away from urban areas is of great interest for the conservation of these species. This review details the work that has been done to date, with the outcomes and expectation for application in the field. Supervised: Served on Dr. Soso's POSC.*

59. Sadler L. J*., L. A. Karriker, A**. K. Johnson**, K. J. Schwartz, T. M. Widowski, C. Wang, and S. T. Millman. 2014. Swine respiratory disease minimally affects responses of nursery pigs to gas euthanasia. Journal of Swine Health and Production. 22:125-133. Impact factor 1.21 (ranking 95/136; Veterinary Sciences). *Role: Creative input into the funded grant, assistance in live pig work, writing, review and editorial input into the manuscript. Significance: The National Pork Board has identified euthanasia as a critical research area. Information from this work can be used to provide guidance to producers on timely euthanasia and how disease might affect its efficacy. Supervised: Served on Dr. Sadler's POSC.*
58. Sadler L. J*., L. A. Karriker, K. J. Schwartz, **A. K. Johnson**, T. M. Widowski, C. Wang, M. A. Sutherland and S. T. Millman. 2014. Are severely depressed suckling pigs resistant to gas euthanasia? Animal Welfare. 23:145-157. Impact factor 1.31 (ranking 38/136; Veterinary Sciences). *Role: Creative input into the funded grant, assistance in live pig work, writing, review and editorial input into the manuscript. Significance: The National Pork Board has identified euthanasia as a critical research area. Information from this work can be used to provide guidance to producers on timely euthanasia and how disease might affect its efficacy. Supervised: Served on Dr. Sadler's POSC.*
57. Sadler L. J*., C. D. Hagen, C. Wang, T. M. Widowski, **A. K. Johnson**, S. T. Millman. 2014. Effects of flow rate and gas mixture on the welfare of neonate and weaned pigs during gas euthanasia. Journal of Animal Science. 92:793-805. Impact factor 2.11 (ranking 8/58; Agriculture, Dairy and Animal Science). *Role: Creative input into the funded grant, assistance in live pig work, writing, review and editorial input into the manuscript. Significance: The National Pork Board has identified euthanasia as a critical research area. Information from this work can be used to provide guidance to producers on timely euthanasia and how disease might affect its efficacy. Supervised: Served on Dr. Sadler's POSC.*
56. Mack, L. A*., D. C. Lay Jr., S. D. Eicher, **A. K. Johnson**, B. T. Richert, and E. A. Pajor. 2014. Growth and reproductive development of male piglets are more vulnerable to mid-gestation maternal stress that that of female piglets. Journal of Animal Science. 92:530-548. Impact factor 2.11 (ranking 8/58; Agriculture, Dairy and Animal Science). *Role: Writing, review and editorial input into the manuscript. Significance: The National Pork Board has identified gestation sow housing is a major research area. Information from this research project appears can provide data for producers either retrofitting or building group housing for their sows. Supervised: Served on Dr. Mack's POSC.*
55. Abell, C. E., **A. K. Johnson**, L. A. Karriker, M. F. Rothschild, S. J. Hoff, G. Sun, R. F. Fitzgerald, and K. J. Stalder. 2014. Using classification trees to detect lameness in sows induced lame using a transient lameness model. Acta Agriculture. Scandavian A. Animal Science. 8:1000-1009. Impact factor 1.84 (ranking 5/58; Agriculture, Dairy and Animal Science). *Role: Creative input into manuscript writing. Significance: The National Pork Board has identified sow longevity as a research are since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides an on-farm practical decision tree to help swine veterinarians and caretakers identify sows earlier.*
54. Ros-Freixedesa, R., L. J. Sadler S. K. Onteru, R. M. Smith, J. M. Young, **A. K. Johnson**, S. M. Lonergan, E. Huff-Lonergan, J. C. M. Dekkers, and M. F. Rothschild. 2014. Relationship between gilt behavior and meat quality using principle component analysis. Meat Science. 264–269. Impact factor 2.62 (ranking 19/128; Food Science and Technology). *Role: Creative input into the funded grant, manuscript writing. Significance: Feed is the largest cost on farm (50 to 75%). Identifying pigs that eat less, but grow as quickly would be a very beneficial selection tool for the U.S. swine industry. This work provides producers information on the benefits of selecting for a more efficient pig.*
53. Pairis-Garcia, M. D*., **A. K. Johnson**, J. L. Bates, M. Stock, L. Stock, A. S. Brommel, K. J. Stalder and L. A. Karriker. 2014. Development and refinement of a technique for short-term intravascular ear catheter placement in mature sows. Laboratory Animals. 48:78-81. Impact factor 1.12 (ranking 33/136; Veterinary Sciences). *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript. Significance: Swine is used extensively as a basic and applied research model. Today, research projects are reviewed by an Animal*

Care committee. Tools and procedures that meet the 3-R's and reduce pain and distress to animals are highly valued. This work provides a novel ear catheter for sows. Supervised: Major Professor for Dr. Pairis-Garcia.

52. Pairis-Garcia, M. D*., **A. K. Johnson**, S. T. Millman, K. J. Stalder and L. A. Karriker. 2014. Yohimbine (alpha 2-antagonistic reversal agent) effects on physiological recovery parameters of anesthetized sows. Journal of Swine Health and Production. Impact factor 1.21 (ranking 95/136; Veterinary Sciences). 22:16-23. *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript. Significance: Swine is used extensively as a basic and applied research model. Today, research projects are reviewed by an Animal Care committee. Tools and procedures that meet the 3-R's and reduce pain and distress to animals are highly valued. This work provides a novel use for Yohimbine to reverse anesthesia in a timely manner. Supervised: Major Professor for Dr. Pairis-Garcia.*
51. Black, J., Gentry-Carter, J. **A. Johnson**, and W. Gill. 2013. Performance and behavior of weaned beef cattle that were fed Tall Fescue dry hay or haylage. Journal of Animal Science. 3:142-149. Impact factor 1.92 (ranking 8/58; Agriculture, Dairy and Animal Science). *Role: Creative input into live cattle work, statistical modelling, and manuscript writing. Significance: Beef producers are always seeking novel dietary formulations for their cattle that do not affect performance and are economically viable.*
50. Tapper, K. R*., **A. K. Johnson**, L. A. Karriker, K. J. Stalder, J. H. Coetzee, R. L. Parsons*, and S. T. Millman. 2013. Pressure algometry and thermal sensitivity for assessing pain sensitivity and effects of flunixin meglumine and sodium salicylate in a transient lameness model in sows. Livestock Science. 157:245-253. Impact factor 1.10 (ranking 17/58; Agriculture, Dairy and Animal Science). *Role: Creative input into the funded grant, assistance in live sow work, statistical modelling, writing, review and editorial input into the manuscript. Significance: The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides an on-farm nociceptor threshold tools to help swine veterinarians and caretakers identify sows earlier. Supervised: Served on Ms. Tapper's POSC.*
49. Pairis-Garcia, M. D*., L. A. Karriker, **A. K. Johnson**, B. Kukanich, L. Wulf, S. T. Millman, K. J. Stalder, and J. F. Coetzee. 2013. Pharmacokinetics of flunixin meglumine in mature swine after intravenous, intramuscular and oral administration. BMC Veterinary Research. 9:165-172. Impact factor 1.74 (ranking 24/136; Veterinary Sciences). *Role: Creative input into the funded grant, assistance in live sow work, statistical modelling, writing, review and editorial input into the manuscript. Significance: The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides an on-farm nociceptor threshold tools to help swine veterinarians and caretakers identify sows earlier. Supervised: Major Professor for Dr. Pairis-Garcia.*
48. Nikkilä, M. T*. K. J. Stalder, B. E. Mote, M. F. Rothschild, F. C. Gunsett, **A. K. Johnson**, L. Karriker, M. V. Boggess and T. V. Serenius. 2013. Genetic parameters for growth, body composition and structural soundness traits in commercial gilts. Journal of Animal Science. 91:2034-2046. Impact factor 1.92 (ranking 8/58; Agriculture, Dairy and Animal Science). *Role: Creative input into manuscript writing and review. Significance: The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides bench marks that can be used in the Gilt Development Unit to select structurally sound gilts. Supervised: Served on Dr. Nikkilä POSC.*
47. Nikkilä, M. T*. K. J. Stalder, B. E. Mote, M. F. Rothschild, F. C. Gunsett, **A. K. Johnson**, L. Karriker, M. V. Boggess and T. V. Serenius. 2013. Genetic associations for gilt growth, compositional and structural soundness traits with sow longevity and lifetime reproductive performance. Journal of Animal Science. 91:1570-1579. Impact factor 1.92 (ranking 8/58; Agriculture, Dairy and Animal Science). *Role: Creative input into manuscript writing and review. Significance: The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides*

bench marks that can be used in the Gilt Development Unit to select structurally sound gilts. Supervised: Served on Dr. Nikkilä POSC.

46. **Johnson, A. K#.**, L. M. Gesing, M. Ellis, J. J. McGlone, E. Berg, S. M. Lonergan, R. Fitzgerald, L. A. Karriker, A. Ramirez, K. J. Stalder, A. Sapkota, R. Kephart, J. T. Selsby, L. J. Sadler and M. J. Ritter. 2013. Farm and pig factors affecting welfare during the marketing process. Journal of Animal Science. 91:2481-2491. Impact factor 1.92 (ranking 8/58; Agriculture, Dairy and Animal Science). *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript and addressed reviewer comments. Significance: The National Pork Board has identified that handling and transportation of pigs is a major research area. Information from this research project appears in the Pork Quality Assurance Plus program.*
45. Karriker, L. A., C. E. Abell, M. D. Pairis, W. A. Holt, G. Sun, J. F. Coetzee, **A. K. Johnson**, S. J. Hoff, and K. J. Stalder. 2013. Validation of a lameness model in sows using physiological and mechanical measurements. Journal of Animal Science 91:130-136. Impact factor 1.92 (ranking 8/58; Agriculture, Dairy and Animal Science). *Role: Creative input into the funded grant, assistance in live sow work, statistical modelling, writing, review and editorial input into the manuscript and helped address reviewer comments. Significance: This was the **first sow paper** published that created and validated an induced lameness model in sows. This model produces a known lameness etiology for us to study management and pharmacological tools.*
44. Pittman-Elmore, M. R*., J. P. Garner, **A. K. Johnson**, R. D. Kirkden, B. T. Richert, and E. A. Pajor. 2012. If you knew what was good for you! The value of environmental enrichments with known welfare benefits is not demonstrated by sows using operant techniques. Journal of Applied Animal Welfare Sciences. 15:254-715. Impact factor 0.89 (ranking 50/136; Veterinary Sciences). This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: Writing, review and editorial input into the manuscript. Significance: The National Pork Board has identified gestation sow housing is a major research area. Information from this research project appears can provide data for producers either retrofitting or building group housing for their sows. Supervised: Served on Dr. Pittman-Elmore's POSC.*
43. Elmore, M. R. P*., J. P Garner, **A. K. Johnson**, R. D. Kirkden, E. G Patterson-Kane, B.T. Richert, and E.A. Pajor. 2012. Differing results for behavioral measures and motivation tests: The value of environmental enrichment to gestating sows housed in stalls. Applied Animal Behaviour Science. 141:9-19. Impact factor 1.91 (ranking 11/55 Agriculture, Dairy and Animal Science). *Role: Writing, review and editorial input into the manuscript. Significance: The National Pork Board has identified gestation sow housing is a major research area. Information from this research project appears can provide data for producers either retrofitting or building group housing for their sows. Supervised: Served on Dr. Pittman-Elmore's POSC.*
42. Berry, N. L*., **A. K. Johnson**, J. Hill. S. Lonergan, L. A. Karriker, and K. J. Stalder. 2012. Loading gantry versus traditional chute for the finisher pig: Effect on welfare at the time of loading and performance measures and transport losses at the harvest facility. Journal of Animal Science. 90:4028-4036. Impact factor 2.09 ((ranking 8/58; Agriculture, Dairy and Animal Science). *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: The National Pork Board has identified that handling and transportation of pigs is a major research area. Information from this research project appears in the Pork Quality Assurance Plus- and the Transport Quality Assurance programs. Supervised: Served on Dr. Berry's POSC.*
41. Dickey, E. R*., **A. K. Johnson**, K. J. Stalder and K. Bregendahl. 2012. Effects of a pre-molt calcium and low-energy molt program on laying hen performance, egg quality and economics. Poultry Science. 91:292-203. Impact factor 1.73 (ranking 42/55). *Role: Creative input into the funded grant, assistance in live hen work, statistical modelling, writing, review and editorial input into the manuscript. Significance: The U.S laying hen industry has been targeted for forced molting practices. Molting is conducted to remove old feathers and provide a production break to the bird. Activists have been concerned that feed and water were removed for a period of time. This work provided data on providing*

the bird water and a low energy diet that still induced molt. Supervised: Co-Major Professor for Ms. Dickey.

40. Fitzgerald, R. F*., K. J. Stalder L. A. Karriker, L. J. Sadler, H. T. Hill J. Kaisand and **A. K. Johnson.** 2012. The effect of hoof abnormalities on sow behavior and performance. Livestock Science. 145:230-238. Impact factor 1.29 (ranking 41 / 56). *Role: Creative input into the funded grant, assistance in live sow work, statistical modelling, writing, review and editorial input into the manuscript. Significance: The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides an on-farm nociceptor threshold tools to help swine veterinarians and caretakers identify sows earlier. Supervised: Served on Dr. Fitzgerald's POSC.*
39. Berry, N*., **A. Johnson**, S. Lonergan, T. Baas, J. Hill, C. Schultz-Kaster, J. Matthews, L. Karriker, and K. Stalder. 2011. Mobiler Treibgang im vergleich mit traditioneller rampe. FLEISCHWIRTSCHAFT July. pp 119-122. Impact factor 0.09 (ranking 120/128 Food Science and Technology). *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: The National Pork Board has identified that handling and transportation of pigs is a major research area. Information from this research project appears in the Pork Quality Assurance Plus- and the Transport Quality Assurance programs. Supervised: Served on Dr. Berry's POSC.*
38. Berry, N*., **A. Johnson**, S. M. Lonergan, T. Baas, J. Hill, C. Schultz-Kaster, J. Matthews, L Karriker and K. Stalder. 2011. Loading gantry versus traditional chute: Effect on fresh pork loin quality attributes when properly loaded. Mobiler Treibgang gegenűber traditioneller rampe. FLEISCHWIRTSCHAFT. June. pp 98-101. 0.09 (ranking 120/128 Food Science and Technology). *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: The National Pork Board has identified that handling and transportation of pigs is a major research area. Information from this research project appears in the Pork Quality Assurance Plus- and the Transport Quality Assurance programs. Supervised: Served on Dr. Berry's POSC.*
37. Pittman-Elmore, M. R*., J. P. Garner, **A. K. Johnson**, R. D. Kirkden, B. T. Richert, and E. A. Pajor. 2011. Getting around social status: Motivation and enrichment use of dominant and subordinate sows in a group setting. Applied Animal Behaviour Science. Impact factor 1.55 (ranking 11/56). 133:154–163. *Role: Writing, review and editorial input into the manuscript. Significance: The National Pork Board has identified gestation sow housing is a major research area. Information from this research project appears can provide data for producers either retrofitting or building group housing for their sows. Supervised: Served on Dr. Pittman-Elmore's POSC.*
36. Gesing, L. M*., **A. K. Johnson**, J. T. Selsby, S. Abrams, H. Hill, A. Whiley, M. Faga., R. Bailey, K. J. Stalder, and M. J. Ritter. 2011. Effects of grow-finish group size on stress responses at loading and unloading and the impact on transport losses from market weight pigs. Professional Animal Scientist. 24:477-484. This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: The National Pork Board has identified that handling and transportation of pigs is a major research area. Information from this research project appears in the Pork Quality Assurance Plus- and the Transport Quality Assurance programs. Supervised: Major Professor for Ms. Gesing.*
35. Sun, G*., R. F. Fitzgerald, S. J. Hoff, L. A. Karriker, **A. K. Johnson**, and K. J. Stalder. 2011. Development of an embedded microcomputer-based force plate system for measuring sow weight distribution. Transactions of the American Society of Applied Biological Engineers. 27:475-482. This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: Creative input into manuscript writing, review and editorial input into the manuscript. Significance: This was the **first paper** published that created and validated a force plate to detect lameness.*
34. **Johnson, A. K#.**, S. M. Lonergan W. D. Busby, S. C. Shouse, D. L Maxwell, J. D. Harmon, and M. S. Honeyman. 2011. Comparison of steer behavior and temperament when housed in a deep bedded hoop

barn versus an open feedlot with shelter. Journal of Animal Science. 89:1893-1898. Impact factor 2.47 (ranking 1/49). Role: *Creative input into the funded grant, assistance in live cattle work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments.* Significance: *There is interest in moving cattle indoors to utilize hoop space, protect the environment from over-grazing and to manage cattle in hot- and cold temperatures. This work provide data on how beef cattle adapt and cope to a hoop building.*

33. Sadler, L. J*., **A. K. Johnson**#, S. M. Lonergan, D. Nettleton, and J. C. M. Dekkers. 2011. The effect of selection for residual feed intake on general behavioral activity and the occurrence of lesions in Yorkshire gilts. Journal of Animal Science. 89:258–266. Impact factor 2.47 (ranking 1/49). Role: *Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript.* Significance: *Feed is the largest cost on farm (50 to 75%). Identifying pigs that eat less, but grow as quickly would be a very beneficial selection tool for the U.S. swine industry. This work provides producers information on the benefits of selecting for a more efficient pig.* Supervised: *Major Professor for Mr. Sadler.*

PEER REVIEWED JOURNAL ARTICLES: ASSISTANT PROFESSOR 2005 TO P & T SUBMISSION OCTOBER 2010 (N = 27)

32. Gesing, L. M*., **A. K. Johnson**#, J. T. Selsby, C. Feuerbach, H. Hill, M. Faga., A. Whiley, R. Bailey, K. J. Stalder, and M. J. Ritter. 2010. Effects of pre-sorting prior to loading on stress responses at loading and unloading and transport losses from market weight pigs. Professional Animal Scientist. 26:603–610. This journal has not yet been awarded an impact factor within a discipline by ISI. Role: *Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments.* Significance: *The National Pork Board has identified that handling and transportation of pigs is a major research area. Information from this research project appears in the Pork Quality Assurance Plus- and the Transport Quality Assurance programs.* Supervised: *Major Professor for Ms. Gesing.*
31. Berry, N*., **A. Johnson**#, S. Lonergan, T. Baas, J. Hill, C. Schultz-Kaster, J. Matthews, L. Karriker, and K. Stalder. 2010. Loading gantry versus traditional chute: Effect on fresh pork loin quality attributes with challenges at loading. FLEISCHWIRTSCHAFT International. 5:69-71. This journal has not yet been awarded an impact factor within a discipline by ISI. Role: *Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments.* Significance: *The National Pork Board has identified that handling and transportation of pigs is a major research area. Information from this research project appears in the Pork Quality Assurance Plus- and the Transport Quality Assurance programs.* Supervised: *Served on Dr. Berry's POSC.*
30. Dickey, E. R*., K. Bregendahl, K. Stalder, R. Fitzgerald, and **A. K. Johnson**#. 2010. Effects of a pre-molt calcium and low-energy molt program on laying hen behavior and heterophil-to-lymphocyte ratios. Poultry Science. 89:2317-2325. Impact factor 1.68 (ranking 8/49; Agriculture, Dairy and Animal Science). Role: *Creative input into the funded grant, assistance in live hen work, statistical modelling, writing, review and editorial input into the manuscript.* Significance: *The U.S laying hen industry has been targeted for forced molting practices. Molting is conducted to remove old feathers and provide a production break to the bird. Activists have been concerned that feed and water were removed for a period of time. This work provided data on providing the bird water and a low energy diet that still induced molt.* Supervised: *Co-Major Professor for Ms. Dickey.*
29. Abell, C. E*., G. F. Jones, **A. Johnson**, and K. J. Stalder. 2010. Using the Genetic Lag Value to Determine the Optimal Parity for Culling in Commercial Swine Breeding Herds. Professional Animal Scientist. 26:404-411. This journal has not yet been awarded an impact factor within a discipline by ISI. Role: *Creative input into manuscript writing.* Significance: *The National Pork Board has identified sow longevity as a research are since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides an on-farm practical decision tree to help swine veterinarians and caretakers identify sows earlier.*

28. Fangman, T. J., **A. K. Johnson**, D. A. Baumert, P. DuBois, and R. Edler. 2010. Willingness to approach behavior and feed disappearance of weaned pigs following vaccination with *Mycoplasma hyopneumoniae* vaccines. Journal of Swine Health and Production. 19:19-25. Impact factor 0.53 (ranking 87/140; Veterinary Science). *Role: Creative input into the funded grant, designed the behavioral experiment, statistical modelling, manuscript writing and editing. Significance: The U.S. Swine industry conducts on-farm welfare assessments and third-party audits. There has been interest in designing an objective human-animal interaction test. This work provides methodology information for on-farm application for a human-animal interaction test.*
27. Honeyman, M. S., W. D. Busby, S. M. Lonergan, **A. Johnson,** D. L. Maxwell, J. D. Harmon, and C. Shouse. 2010. Performance of beef cattle in bedded hoop barns. Journal of Animal Science. 88:2797-2801. Impact factor 2.47 (ranking 1/49; Agriculture, Dairy and Animal Science). *Role: Creative input into the funded grant, assistance in live cattle work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: There is interest in moving cattle indoors to utilize hoop space, protect the environment from over-grazing and to manage cattle in hot- and cold temperatures. This work provide data on how beef cattle adapt and cope to a hoop building.*
26. Elmore, M. R*., **A. K. Johnson,** B. T. Richert, J. P. Garner, and E. A. Pajor. 2010. A flooring comparison: The impact of rubber mats on the behavior and welfare group housed sows at breeding. Applied Animal Behaviour Science. 123:7-15. Impact factor 1.83 (ranking 5/49; Agriculture, Dairy and Animal Science). *Role: Writing, review and editorial input into the manuscript. Significance: The National Pork Board has identified gestation sow housing is a major research area. Information from this research project appears can provide data for producers either retrofitting or building group housing for their sows. Supervised: Served on Dr. Pittman-Elmore's POSC.*
25. Berry, N*., **A. Johnson**#, S. M. Lonergan, T. Baas, J. Hill, C. Schultz-Kaster, J. Matthews, L Karriker and K. Stalder. 2010. Loading gantry versus traditional chute: Effect on fresh pork loin quality attributes when properly loaded. FLEISCHWIRTSCHAFT International. 1:60-63. This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: The National Pork Board has identified that handling and transportation of pigs is a major research area. Information from this research project appears in the Pork Quality Assurance Plus- and the Transport Quality Assurance programs. Supervised: Served on Dr. Berry's POSC.*
24. **Johnson, A. K.**#, L. J. Sadler*, L. M. Gesing*, C. Feuerbach, H. Hill, M. Faga, R. Bailey, K. J. Stalder, and M. J. Ritter. 2010. Effects of facility design on the stress responses of market weight pigs during loading and unloading. Professional Animal Scientist. 2:9-17. This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: The National Pork Board has identified that handling and transportation of pigs is a major research area. Information from this research project appears in the Pork Quality Assurance Plus- and the Transport Quality Assurance programs.*
23. Ritter, M. J., M. Ellis, N. L. Berry, S. E. Curtis, L. Anil, M. Benjamin, E. Berg, D. Butler, C. Dewey, B. Driessen, P. DuBois, J. Hill, J. Marchant-Forde, P. Matzat, J. McGlone, P. Mormède, T. Moyer, K. Pfalzgraf, J. Salak-Johnson, M. Siemens, J. Sterle, C. Stull, T. Whiting, B. Wolter, S. R. Niekamp, and **A. K. Johnson**. 2009. Transport losses in market weight pigs: Definitions, incidence and economic impact. Professional Animal Scientist. 2:5:404-414. This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: Dr. Butters-Johnson was invited to attend the National Pork Boards workshop to address factors that cause a pig to become fatigued at the time of marketing. Prior to the meeting, attendees were assigned 20 papers to review and score using a predetermined matrix from Dr. Ritter. Dr Butters-Johnson attended a three day in person meeting. Writing, review and editorial input was also completed. Significance: The National Pork Board has identified that handling*

and transportation of pigs is a major research area. Information from this research project appears in the Pork Quality Assurance Plus- and the Transport Quality Assurance programs.

22. Meiszberg, A. M*., **A. K. Johnson#**, L. J. Sadler, J. A. Carroll, J. W. Dailey, and N. Krebs. 2009. Drinking behavior in nursery pigs: determining the accuracy between an automatic water meter versus human observers. Journal of Animal Science. 87:4173-4180. Impact factor 2.47 (ranking 1/49; Agriculture, Dairy and Animal Science). *Role: Creative input into the funded grant, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: Water is termed "the forgotten nutrient" in pig production. Pigs are prandial drinkers and eaters, and the amount they drink and how often is poorly understood. Scoring drinking behavior live (or from video) is very time consuming so* ***this novel paper*** *investigated how accurate a water meter was. Supervised: Ms. Meizberg's undergraduate mentor.*
21. **Johnson, A. K#.**, J. R. Garvey*, L. J. Sadler*, J. L. Morrow, K. J. Stalder, and J. J. McGlone. 2009. Pre- weaning mortality in loose-housed suckling piglets: Behavioral differences between piglets in litters whose co-specifics are killed or not killed in the first 72 hours after parturition. Acta Agriculturae Scandavian Section A. Animal Science. 59:53-58. Impact factor 0.65 (ranking 27/49; Agriculture, Dairy and Animal Science). *Role: PhD work. Creative input into the funded grant, sow and piglet field work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: Pre-weaning morality has been estimated to cost the U.S. swine industry $600 million/year. In addition, there has been an interest to house farrowing and lactating sows outdoors on pasture. This work investigated the housing effect on pre-weaning morality in piglets. Supervised: Ms. Garvey undergraduate mentor.*
20. Fitzgerald, R. F*., K. J. Stalder, P. M. Dixon, **A. K. Johnson**, L. Karriker, and G. F. Jones. 2009. The accuracy and repeatability of sow body condition scoring. Professional Animal Scientist. 25:415-425. This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: Creative input into manuscript writing and review. Significance: The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides bench marks that can be used in the Gilt Development Unit to select structurally sound gilts. Supervised: Served on Dr. Fitzgerald's POSC.*
19. Millman, S. T., **A. K. Johnson**, A. M. O'Connor, and A. J. Zanella. 2009. Animal welfare and epidemiology: Across species, across disciplines and across borders. Journal of Applied Animal Welfare Science. 2:83-87. Impact factor 0.72 (ranking 71/140; Veterinary Science). *Role: Creative input into the funded grant and* ***hosted the first U.S. conference*** *on the link between epidemiology and animal welfare.*
18. Fitzgerald, R. F*., K. J. Stalder, J. O. Matthews, C. M. Schultz Kaster, and **A. K. Johnson**. 2009. Factors increasing fatigued, injured, and dead pig frequency during transport and lairage at a commercial abattoir. Journal of Animal Science. 87:1156–1166. Impact factor 2.47 (ranking 1/49; Agriculture, Dairy and Animal Science). *Role: Creative input into the funded grant, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: The National Pork Board has identified that handling and transportation of pigs is a major research area. Information from this research project appears in the Pork Quality Assurance Plus- and the Transport Quality Assurance programs. Supervised: Served on Dr. Fitzgerald's POSC.*
17. Jackson, C. J*., L. A. Karriker, K. J. Stalder, and **A. K. Johnson#**. 2009. Number of visits and length of each visit to a nipple cup drinker by 7-week-old pigs after a water deprivation period or ad libitum access to water. Journal of Swine Health and Production: March–April. 76-80. Impact factor 0.50 (ranking 73/133; Veterinary Science). *Role: Creative input into the funded grant, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: Water is termed "the forgotten nutrient" in pig production. Pigs are prandial drinkers and eaters, and the amount they drink and how often is poorly understood, especially in "out-of-water" events. Supervised: Major Professor for Ms. Jackson.*

16. **Johnson, A. K[#]**. 2008. Farm animal behavior and welfare: the past, the future and how can ASAS play an integral role? Journal of Animal Science. 2009. 87:2175–2179. Impact factor 2.12 (ranking 4/45; Agriculture, Dairy and Animal Science). *Role: This was a sole author contribution by Dr. Butters-Johnson in which she was responsible for reviewing the scientific literature, preparing the manuscript and addressing the comments provided by the reviewers and editor.*
15. **Johnson, A. K[#]**. 2008. Setting the farm animal welfare scene in North America. Personnel invitation from the American Society of Applied Engineers Organizational Committee of 2008. Brazilian Journal of Biosystems Engineering. 2:57-69. Impact factor 0.45 (ranking 12/114; Engineering and Chemical). *Role: This was a sole author contribution by Dr. Butters-Johnson in which she was responsible for reviewing the scientific literature, preparing the manuscript and addressing the comments provided by the reviewers and editor.*
14. **Johnson, A. K[#]**., L. J. Sadler[*], K. J. Stalder, and W. Powers. 2008. Influence of corn co-products on the behavioral repertoire of grow-finish pigs. ACTA Agriculture Scandinavian Part A. Animal Science. 58:209-213. Impact factor 1.56 (ranking 10/45; Agriculture, Dairy and Animal Science). *Role: Creative input into the behavioral experiment, assistance in live pig work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Feed is the largest cost on farm (50 to 75%). Identifying pigs that eat less, but grow as quickly would be a very beneficial selection tool for the U.S. swine industry. This work provides producers information on the benefits of selecting for a more efficient pig. Supervised: Mr. L. Sadler, Technician.*
13. **Johnson, A. K[#].**, F. M. Mitloehner, J. L. Morrow, and J. J. McGlone. 2008. Heat stress in the outdoor lactating sow: Influence of shaded wallows in behavior, performance and physiology. Journal of Animal Science. 86:3628-3634. Impact factor 2.12 (ranking 4/45; Agriculture, Dairy and Animal Science). *Role: PhD work. Creative input into the funded grant, sow field work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: Heat stress in sows has an enormous negative economical and welfare effect. There has been interest to keep sows outdoors but these sows are then exposed to extreme heat in the pan-handle of Texas. This novel work compared the wallow usage by lactating sows.*
12. Stalder, K. J., D. Miller, C. Johnson, M. Boggess, L. Karriker, and **A. Johnson**. 2008. Cooperative effort leads to the development of tools to assist pork producers in evaluating structural soundness of replacement gilts. Journal of Extension. 46:4. This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: Creative input into manuscript writing and review. Significance: The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides bench marks that can be used in the Gilt Development Unit to select structurally sound gilts.*
11. Fitzgerald, R*****., K. Stalder, L. Karriker, C. Johnson, L. Layman, and **A. Johnson**. 2008. Developing and utilizing visual tools to assist pork producers in employee training in the evaluation of sow body condition score. Journal of Extension. 46:2. This journal has not yet been awarded an impact factor within a discipline by ISI. *Role: Creative input into manuscript writing and review. Significance: The National Pork Board has identified sow longevity as a research area since 2003. In addition, sow lameness ranks third for culling sows, and effects sow welfare, worker morale and economics. This work provides bench marks that can be used in the Gilt Development Unit to select structurally sound gilts.*
10. **Johnson, A. K[#].**, J. L. Morrow, J. W. Dailey, and J. J. McGlone. 2007. Pre-weaning mortality in loose housed lactating sows: Behavioral and performance differences between sows who crush or do not crush piglets. Applied Animal Behaviour Science. 105:59-74. Impact factor 1.40 (ranking 14/47; Agriculture, Dairy and Animal Science). *Role: PhD work. Creative input into the funded grant, sow and piglet field work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: Pre-weaning morality has been estimated to cost the U.S. swine industry $600 million/year. In addition, there has been an interest to house farrowing*

and lactating sows outdoors on pasture. This work investigated the housing effect on pre-weaning morality in piglets.

9. Cutler, S. A., S. M. Lonergan, N. Cornick, **A. K. Johnson**, and C. H. Stahl. 2007. Dietary inclusion of Colicin E1 is effective in preventing *Escherichia coli* F18 caused post-weaning diarrhea in weanling pigs. Antimicrobial Agents and Chemotherapy. 51:3830-3835. Impact factor 4.39 (ranking 15/128; Microbiology). *Role: Created the behavioral experiment, nursery pig field work, statistical modelling, writing, review and editorial input into the manuscript. Significance: At weaning pigs are subjected to a multitude of stressors that can affect their health and well-being. Understanding how Colicin E1 specifically affects behavior and performance is important for producers to understand the importance of biosecurity and making sure that barns and pens are very clean before placement.*
8. Gonyou, H. W., M. C. Brumm, E. Bush, J. Deen, S. E. Edwards, T. Fangman, J. J. McGlone, M. Meunier-Salaun, R. B. Morrison, H. Spoolder, P. L. Sundberg, and **A. K. Johnson**. 2006. Application of broken line analysis to assess floor space requirements of nursery and grow-finish pigs. Journal of Animal Science. 84:229-235. Impact factor 1.98 (ranking 5/44; Agriculture, Dairy and Animal Science). *Role: Dr. Butters-Johnson was invited to attend the National Pork Boards workshop to create a model that can work out the space needs for the growing pig. Dr. Butters-Johnson was Director for Swine Well-Being and organized the meeting. Prior to the meeting, attendees were assigned 10 papers to review and score using a predetermined matrix from Dr. Butters-Johnson. Dr Butters-Johnson attended a three day in person meeting. Writing, review and editorial input was also completed. Significance: The model created by the attendees is still referenced today and used in research.*
7. Morrow J. L., F. M. Mitloehner, **A. K. Johnson**, M. L. Galyean, J. W. Dailey, T. S. Edrington, R. C. Anderson, K. J. Genovese T. L. Poole. S. E. Duke, and T. R. Callaway. 2005. Effect of water sprinkling on incidence of zoonotic pathogens in feedlot cattle. Journal of Animal Science. 83:1959-1966. Impact factor 1.36 (ranking 10/43; Agriculture, Dairy and Animal Science). *Role: Dairy cattle field work, manuscript writing and review. Significance: Food borne disease remains the most important concern for the U.S. livestock industry. Balancing the cows' needs through cooling systems and how this might affect zoonotic disease was investigated.*
6. Callaway, T. R., J. L. Morrow, **A. K. Johnson**, J. W. Dailey, F. M. Wallace, E. A. Wagstrom, J. J. McGlone, A. R. Lewis, S. E. Dowd, T. L. Poole, T. S. Edrington, R. C. Anderson, K. J. Genovese, J. A. Byrd, R. B. Harvey, and D. J. Nisbet. 2005. Environmental prevalence and persistence of Salmonella spp. in outdoor swine wallows. Foodborne Pathological Diseases. 2:263-273. Impact factor 2.91 (ranking 5/103; Food science and Technology). *Role: Swine field work, manuscript writing and review. Significance: Food borne disease remains the most important concern for the U.S. livestock industry. Balancing the sows' needs through cooling systems and how this might affect zoonotic disease was investigated.*

PEER REVIEWED JOURNAL ARTICLES PRIOR TO IOWA STATE UNIVERSITY (N = 5)

5. McGlone, J. J., E. H. von Borrell, J. Deen, **A. K. Johnson**, D. G. Levis, M. Meunier-Salaün, J. L. Morrow, D. Reeves, J. L. Salak-Johnson and, P. L. Sundberg. 2004. Review of scientific literature comparing housing systems for gestating sows and gilts using measures of physiology, behavior, performance and health. Professional Animal Scientist. 20:105-117. This journal has not yet been awarded an Impact Factor or ranking within a discipline by ISI. *Role: Dr. Butters-Johnson was invited to attend the National Pork Boards workshop to create a model that can work out what is the "best" gestation sow housing system. Dr. Butters-Johnson was Director for Swine Well-Being and organized the meeting. Prior to the meeting, attendees were assigned 30 papers to review and score using a predetermined matrix from Dr. Butters-Johnson. Dr Butters-Johnson attended a three day in person meeting. Writing, review and editorial input was also completed. Significance: The review paper was used by the National Pork Boards Animal Well-Being committee, the National Pork producers Well-Being Committee and the American Association of Swine Veterinarians Animal Well-Being Committee to write sections of the Swine Care Handbook, the Swine Welfare Assurance Program and gestation sow housing policies.*

4. **Johnson, A. K#.,** and J. J. McGlone. 2003. Fender design and insulation of farrowing huts: effects on performance of outdoor sows and piglets. Journal of Animal Science. 81:955-964. Impact factor 1.56 (ranking 3/41; Agriculture, Dairy and Animal Science). *Role: PhD work. Creative input into the funded grant, sow and piglet field work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: Pre-weaning morality has been estimated to cost the U.S. swine industry $600 million/year. In addition, there has been an interest to house farrowing and lactating sows outdoors on pasture. This work investigated the housing effect on pre-weaning morality in piglets.*
3. Barham, A. R., B. L. Barham, **A. K. Johnson**, D. M. Allen, J. R. Blanton, Jr. and M. F. Miller. 2002. Effect of the transportation of beef cattle from the feedyard to the packing plant on prevalence levels of *Escherichia* coli O157 and *Salmonella* spp. Journal of Food Protection. 65:280-283. Impact factor 1.67 (ranking 8/103; Food science and Technology. *Role: Beef cattle field work, manuscript writing, review and editorial input. Significance: Food borne disease remains the most important concern for the U.S. livestock industry. Determining how transport stress effects shedding was investigated.*
2. Grigor, P. N., M. S. Cockram, W. B. Steele, C. J. Le Sueur, J. A. Guthrie, **A. K. Johnson**, V. Sandilands, H. W. Reid, C. Sinclair, and H. K. Brown. 2001. Effects of space allowance during transport and duration of mid journey lairage period on the physiological, behavioural and immunological responses of young calves during and after transport. Animal Science. 73:341-360. Impact factor 1.08 (ranking 11/44; Agriculture, Dairy and Animal Science). *Role: MS work. Creative input to experimental design, field data collection, statistical modelling, writing, review and editorial input into the manuscript. Significance: Transportation has been identified by the European Union as being a "flash-point" where welfare can become comprised. Little is known about the stress on veal calves and how long-if at all calves should be rested. Data from this work was used in the EU Transport Directives and can be located at https://ec.europa.eu/food/animals/welfare/practice/transport_en*
1. **Johnson, A. K#.**, J. L. Morrow-Tesch and J. J. McGlone. 2001. Behavior and performance of lactating sows and piglets reared indoors or outdoors. Journal of Animal Science. 79:2571-2579. Impact factor 1.33 (ranking 6/44; Agriculture, Dairy and Animal Science). *Role: PhD work. Creative input into the funded grant, sow and piglet field work, statistical modelling, writing, review and editorial input into the manuscript and responded to the reviewer comments. Significance: There has been an interest to house farrowing and lactating sows outdoors on pasture. This work investigated indoor- vs outdoor housing effect on performance.*

PEER REVIEWED JOURNAL ARTICLES: AWAITING OUTCOME (N = 2)

1. Akin E. E*., **A. K. Johnson#**, C. D. Jass, L. A. Karriker, J. W. Ross, K. J. Stalder, J. P. Stinn and S. T. Millman. 2021. Providing humane on-farm handling tools to move non-ambulatory grow-finish pigs on a commercial farm. ***Submitted to Journal of Swine Health and Production. September 2021.***
2. Sundman, E. D*., N. K. Gabler, S. T. Millman, K. J. Stalder, L. A. Karriker, and **A. K. Johnson**. 2021. The use of attractants to stimulate neonatal piglet interest in rope enrichment. ***Submitted to Animals. December 2021.***

BOOK CHAPTERS: PROFESSOR (JULY 2018) TO SEVEN-YEAR REVIEW 2024 (N = 1)

7. **Johnson, A. K.,** J. D. Colpoys, L. N. Edwards, M. Calvo-Lorenzo, J. J. McGlone, S. T. Millman, C. E. Philips, M. J. Ritter, M. A. Sutherland, A. Tucker and, S. R. Webb. 2019. Chapter 3: Behavior and Welfare. In. Swine Diseases. Pp 32-50. John Wiley & Sons, Inc. *Role: Dr. Butters-Johnson was responsible for identifying co-authors, inviting them to write, providing them the sections that needed to work on, editing the sections that were sent back and is working with Dr. L. Karriker (editor) to move this towards publication. Dr. Butters-Johnson was responsible for reviewing the scientific literature and writing the lameness section. Approximate contribution, 50%. Anna Butters-Johnson was the lead author on this book chapter, in part, for literature acquisition, interpretation and preparation of the book chapter.*

BOOK CHAPTERS: P & T REVIEW (OCTOBER 2010 TO JUNE 2011), ASSOCIATE PROFESSOR TO FULL PROFESSOR SUBMISSION (N = 4)

6. McGlone, J. J., **A. K. Johnson,** A. Sapkota, and R. K Kephart. 2014. Transport of market pigs: Improvements in welfare and economics. In: T. Grandin (Ed) Livestock Handling and Transport, CAB International, Wallingford, Oxon, UK. Pp. 298-314. *Role: Dr. Butters-Johnson was responsible for the literature search, article review and writing of the following subsections: behavioural genetics and the link to swine well-being, maintenance behaviours, maternal behaviours and aggressive behaviours. Dr. Butters-Johnson peer reviewed Dr. McGlone's, sub sections.*
5. **Johnson, A. K.**, and J. N. Marchant-Forde. 2014. Welfare of pigs in the farrowing environment. In: (Ed. J. N. Marchant-Forde). The Welfare of Pigs. Pp 141-188. China Agricultural Press. ISBN: 978-7-109-20027-2. *Role: Dr. Butters-Johnson was responsible for the literature search, article review and writing of the following subsections: loading chute design, handling tools and bedding and boarding requirements in the Midwest. Dr. Butters-Johnson peer reviewed Dr. McGlone's, Dr. Sapkota and Ms. Kephart's sub sections.*
4. **Johnson, A. K.,** L. N. Edwards, S. R. Niekamp, C. Philips, M. Sutherland, S. Torrey, T. Casey-Trott, A. Tucker and T. Widowski. 2011. Chapter 3: Behavior and Welfare. In. Swine Diseases. Pp 32-50. John Wiley & Sons, Inc. ISN: 978-0-8138-2267. *Role: Dr. Butters-Johnson was responsible for identifying co-authors, inviting them to write, providing them the sections that needed to work on, editing the sections that were sent back and is working with Dr. L. Karriker (editor) to move this towards publication. Dr. Butters-Johnson was responsible for reviewing the scientific literature and writing the lameness section. Approximate contribution, 50%. Anna Butters-Johnson was the lead author on this book chapter, in part, for literature acquisition, interpretation and preparation of the book chapter.*
3. **Johnson A. K.**, and J. J. McGlone. 2010. Behavior genetics of the domestic pig. In: (Ed. A. Ruvinsky and M. Rothschild). The genetics of the pig. Pp 200-218. CABI Int. ISBN: 978-1-84593-7560. *Role: Dr. Butters-Johnson was responsible for the literature search, article review and writing of the following subsections: behavioural genetics and the link to swine well-being, maintenance behaviours, maternal behaviours and aggressive behaviours. Dr. Butters-Johnson peer reviewed Dr. McGlone's, sub sections.*

BOOK CHAPTERS: ASSISTANT PROFESSOR 2005 TO P & T SUBMISSION OCTOBER 2010 (N = 2)

2. **Johnson, A. K.**, and J. N. Marchant-Forde. 2009. Welfare of pigs in the farrowing environment. In: (Ed. J. N. Marchant-Forde). The Welfare of Pigs. Pp 141-188. Springer Science + Business Media B.V., Dordrecht. The Netherlands. ISBN: 978-1-4020-8908-4 e-ISBN: 978-1-4020-8909. *Role: Dr. Butters-Johnson was responsible for the literature search, article review and writing of the following subsections: introduction, overall welfare assessment for the sow and her litter, natural farrowing behavior. Dr. Butters-Johnson co-wrote economic considerations of farrowing systems and challenges with different farrowing systems for the sow and her litter with Dr. Marchant-Forde.*
1. Gentry, J. G., **A. K. Johnson**, and J. J. McGlone. 2008. The welfare of growing-finishing pigs. In: (Ed. L. Faucitano and A. L. Schaefer). Welfare of pigs from birth to slaughter. Pp 133 to 161. Wageningen Academic. ISBN-13; 978-90-8686-066-1. Library of Congress Control Number: 2008933377. *Role: Dr. Butters-Johnson was responsible for the literature search, article review and writing of the following subsections: the nursery environment. Dr. Butters-Johnson peer reviewed Dr. McGlone and Dr. Gentry's, sub sections.*

PEER REVIEWED ABSTRACTS: PROFESSOR (JULY 2018) TO SEVEN-YEAR REVIEW 2024 (N = 20)

131. Brezina CM, Dewell GA, Dewell RD, Parsons RL, **Johnson AK**, Haley DB, and Millman ST, 2021. Are beef calves placed in a herd with familiar cohorts more resilient to stress than unfamiliar calves? National Veterinary Scholars Symposium, Ames, IA, August 4-6, 2021.
130. Brezina CM, Dewell GA, Dewell RD, Parsons RL, **Johnson AK**, Haley DB, and Millman ST, 2021. Are beef calves placed in a herd with familiar cohorts more resilient to stress than unfamiliar calves? Iowa State University College of Veterinary Medicine Veterinary Summer Scholar Research Day, Ames, IA, August 11, 2021.

129. Meyer, M. M.*, **A. K. Johnson**, and E. A. Bobeck^. 2021. Laser environmental enrichment increased broiler activity and upregulated myogenic gene expression in the *pectoralis major* muscle. Poultry Science Association. 100(E-Supplement 1); #314P pg. 159. https://poultryscience.org/files/galleries/2021_PSA_Annual_Meeting_Abstract_Book.pdf
128. Meyer, M. M.*, **A. K. Johnson**, and E. A. Bobeck^. 2021. Laser environmental enrichment increased body weight and *pectoralis major* muscle width while improving woody breast score in broilers. Poultry Science Association. 100(E-Supplement 1); #316P pg. 159. https://poultryscience.org/files/galleries/2021_PSA_Annual_Meeting_Abstract_Book.pdf
127. Koltes, D., **A. Johnson**, P. Auwerda*, L. Greiner*, and C. Burgett. 2021. Creating online engagement in a world of black boxes. Poultry Science Association. 100(E-Supplement 1); #481S pg. 233. https://poultryscience.org/files/galleries/2021_PSA_Annual_Meeting_Abstract_Book.pdf
126. Stambuk, C*., **A. Johnson**, K. Lane* and K. Stalder. 2021. Determining the time needed from the end of farrowing for newborn piglets to rest on a heat mat for the first time. 8th International Conference on the Assessment of Animal Welfare at Farm and Group Level (WAFL). Poster #156, Pg. 31.
125. **Johnson, A**., C. Rademacher, J. Eggers, N. Gabler, L. Greiner, J. Kaisand, S. Millman, J. Patience, L. Schulz, S. Webb and J. Ross. 2021. Innovative strategies for managing swine welfare during natural disasters. Invited. Natural Behavior and Well-Being Symposium. Journal of Animal Science. 99(3) DOI: https://doi.org/10.1093/jas/skab235.010
124. Meyer, M. M*., **A. K. Johnson**, and E. A. Bobeck^. 2020. Broiler laser enrichment stimulated laser-following behavior and indirectly increased proportion of birds moving. Virtual Poultry Science Association Annual Meeting.
123. Robbins, J. A., **A. K. Johnson**, J. A. Danielson, K. Proudfoot and S. T. Millman. Injecting Animal Welfare into the Veterinary Curriculum. Veterinary Educator Collaborative Symposium. Manhattan, KS. June 21-23, 2020 *(accepted - event cancelled due to covid-19)*
122. Wilson, S., P. Gray, **A. Johnson**, G. Dewell, R. Dewell and S. Millman. 2020. Does Social Buffering Enhance Animal Welfare And Performance When Beef Calves Are Commingled In Feedyard Environments? Presented at the College of Veterinary Medicine Summer 2020.
121. Robbins, J. A., R. L. Parsons, G. A. Dewell, D. B. Haley, **A. K. Johnson**, R. D. Dewell and S. T. Millman. An exploration of sociality in pre-weaned beef calves. American Society of Animal Science Annual Meeting. Midwest Section. Omaha, NE. March 2, 2020.
120. Bobeck, E^., A., M. M. Meyer*, and **A. K. Johnson**. 2019. Broiler enrichment: welfare and performance benefits. Poultry Science. 98(E1):53.
119. Meyer, M. M*., **A. K. Johnson** and E. A. Bobeck^. 2019. Methods to evaluate broiler welfare and environmental enrichment for research and on-farm audits. Poultry Science. 98(E1):162.
118. Meyer, M. M*., **A. K. Johnson**, and E. A. Bobeck^. 2019. A unique form of environmental enrichment motivated broiler physical activity and maintained tibia quality. Poultry Science. 98(E1):10.
117. Robbins, J.A., R. L. Parsons*, **A. K. Johnson**, M. W. Jorgensen*, J. A. Danielson, and S. T. Millman. 2019. Socio-demographic factors associated with attitudes towards animals among first year veterinary students. Journal of Animal Science. 97(53):5-6.
116. Akin, E*., **A. Johnson**, J. Brown, C. Jass, H. Kittrell, S. Millman, J. Ross, K. Skoland, K. Stalder, J. Stinn, and L. Karriker. 2019. Providing handling tools to move non-ambulatory pigs on-farm. 53rd Congress of the International Society of Applied Ethology (ISAE). Page 53. https://www.applied-ethology.org/res/ISAE%202019%20Congress%20proceedings.pdf Bergen, Norway.
115. Forseth, A*., S. Azarpajouh*, L. Karriker, K. Stalder, S. Millman, R. Parsons*, J. Stock, and **A. Johnson**. 2019. Does lameness etiology affect sow-caretaker interaction and movement? Proceedings American Association of Swine Veterinarians 50th Annual Meeting, Orlando, Florida. p 309.
114. Akin, E*., **A. Johnson**, C. Jass, J. Ross, S. Millman, J. Stinn, and K. Stalder. 2019. Providing humane on-farm handling tools to move grow-finish pigs on commercial farms. Journal of Animal Science. 97(2).232. https://doi.org/10.1093/jas/skz122.408
113. Chipman, A., C. J. Rademacher, C. Johnson, J. Stalder, **A. K. Johnson**, A. F. Keating, J. F. Patience, N. K. Gabler, D. Linhares, K. Schwartz, S. T. Millman, J. Studer, Z. Kiefer, S. Schmitz-Esser, G. Silva

and J. W. Ross. 2018. Pelvic organ prolapse: An industry-wide collaboration to identify putative contributing factors. A. D. Leman conference. St. Paul, Minnesota.

112. Dewell, G., R. L. Parsons*, R. Dewell, R. Coetzee, J. F. Noffsinger, **A. K. Johnson**, and S. T. Millman. 2018. Acclimating cattle: Effects on stress and health. The American Association of Bovine Practioners Proceedings. 51(2)274.
111. Parsons R. L*., G. Dewell, R. Dewell, J. F. Coetzee, T. Noffsinger, **A. K. Johnson**, and S. T. Millman. 2018. Acclimating feedlot cattle: Effects on stress and production. Journal of Animal Science. 96(3):7. 10.1093/jas/sky404.016
110. Parsons R. L*., G. Dewell, R. Dewell, J. F. Coetzee, T. Noffsinger, **A. K. Johnson**, and S. T. Millman. 2018. Acclimating feedlot cattle: Effects on home pen behavior. Journal of Animal Science. 96(3):14-15. https://doi.org/10.1093/jas/sky404.032
109. Parsons, R. L*., G. Dewell, R. Dewell, J. F. Coetzee, T. Noffsinger, **A. K. Johnson** and S. T. Millman. 2018. Effect of acclimation and low-stress handling on beef cattle activity. Proceedings of the 52nd Congress of the International Society for Applied Ethology., p. 95. University of Prince Edward Island, Charlottetown, PE, Canada.

PEER REVIEWED ABSTRACTS: P & T REVIEW (OCTOBER 2010 TO JUNE 2011), ASSOCIATE PROFESSOR TO FULL PROFESSOR SUBMISSION (N = 55)

108. Bundy, J^., **A. Johnson**, J. Sterle, G. Krahn. 2018. Increasing student comfortability in a livestock handling, safety, and welfare course. North American Colleges and Teachers of Agriculture (NACTA). 62(1).
107. Mumm, J. M*., S. Azarpajouh*, J. D. Stock, K. J. Stalder, **A. K. Johnson**, and J. A. Calderón-Díaz. 2017. Do lame sows need more time to stand up? Journal of Animal Science. 95:3.
106. Mumm, J. M*., J. D. Stock, S. Azarpajouh*, K. J. Stalder, **A. K. Johnson**, and J. A. Calderón-Díaz. 2017. Dynamic space requirements of lame and non-lame sows determined by the lying-standing sequence. Journal of Animal Science. 95:3.
105. Huff-Lonergan, J. E. Cunnick, **A. K. Johnson**, and J. A. Sterle. 2017. Development and implementation of s Peer Evaluation Teaching Protocol in a Large Animal Science Program. 2017.
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1. Animals. An International Journal of Animal Bioscience (ISSN 2076-2615). ***Editorial Board Member*** with Dr. J. McGlone. Special edition: Pig Transport. Total of 14 papers were approved. http://www.mdpi.com/journal/animals/special_issues/pig-trans
2. Animal Frontiers
3. Applied Animal Behaviour Science.
4. British Poultry Science.
5. Canadian Swine Research and Development Cluster
6. Journal of Animal Science; Animal Production section
7. Journal of Applied Animal Welfare Science
8. Journal of Swine Health and Production
9. Livestock Science
10. Livestock Research Innovation Corporation
11. Meat Science
12. Midwest Poultry Consortium.
13. National Pork Board
14. The National Institute for Occupational Safety and Health
15. Professional Animal Scientist

SUCCESSFUL COMPETITIVE FUNDING: PROFESSOR (JULY 2018) TO SEVEN-YEAR REVIEW 2024 ($3,179,824)

Grants related to the area of Dr. Butters-Johnson's PRS: ***Research*, *Extension*, & *Teaching***
Gift generously given to Dr. Butters-Johnson to support her program

100. 2021. **Johnson, A. K. Farm Animal Care and Well-being Postdoctoral Research Associate.** Iowa Farm Bureau Federation ***Extension.*** $64,000. *Role*: *Wrote the funding request.*
99. 2021. **Johnson, A. K.** Iowa Pork Producers Association Fellowship for Mr. J. Yarian. ***Research; internal.*** $25,000. *Role*: *Wrote the funding request.*
98. 2021. Pairis-Garcia, M., **A. Johnson**, and G. Machado. Refining sample size recommendations for PQA Plus and CSIA audit tool. National Pork Board. $178,442. ***Research*/ *Extension.*** *Role: Partly responsible for initial ideas and writing the grant. Objective: (To validate swine population sampling size needed to accurately estimate (95% confidence) animal benchmarking criteria. Outcomes: Fund one Post-Doctoral Associate, One PhD student and two undergraduates.*
97. 2021. Bobeck, E., and **A. K. Butters-Johnson**. Refinement of a validated, novel laser enrichment device for broilers. USDA-NIFA-AFRI-00762. Foundational and Applied Science Program: A1251 Welfare and Well-Being of Agricultural Animals. $650,000. ***Research*/ *Extension.*** *Role: Partly responsible for initial ideas and writing the grant. Objectives: (1) determine the optima; duration (minutes) for each laser exposure (2) quantify the optimal number of laser exposures per day and (3) deploy lasers in commercial test barns using optimized duration and exposure number. Outcomes: Fund one PhD student for 5-years and a partial technician.*
96. 2021. Dekkers, J. C. M., **A. K. Johnson**, G. Hu, and N. Serao. Automated early detection of disease in individual grow-finish pigs using deeding and drinking behavior data. ***Research*/ *Extension.*** Iowa Pork Producers Association. $69,935. *Role: Partly responsible for initial ideas and writing the grant. Objectives: Develop automated methods for early detection of disease in late stage nursery and finisher pigs at the individual and pen levels using eating and drinking behavioral pattern data, in conjunction with environmental data (temperature and humidity). Identify the minimal data recording requirements for the methods developed under 1), with the aim to identify feeding and drinking monitoring systems that can be implemented in commercial nursery and finisher barns. Outcomes: Fund one PhD student for 1-year*
95. 2021. Siegford, J., S. Turner, F. Akaichi, M. Benjamin, D. Rozeboom, J. Steibel, B. Vigors, **A. Butters-Johnson**, M. Pairis-Garcia, D. Thompson, and C. Zangaro. Understanding precision livestock farming adoption in the U.S. swine industry: Examining needs, perceptions, and willingness to pay of users and consumers. ***Research*/ *Extension.*** USDA NIFA AFRI: IDEAS. $1,000,000. *Role: Partly responsible for initial ideas and writing the grant. Objectives: Our over-arching goal is to work with U.S. swine industry stakeholders (from conception to consumption), to understand their perceptions, needs, and barriers relative to Precision Livestock Farming to improve adoption of useful PLF on swine farms through the following 5 objectives. (1) Our interdisciplinary team of animal and welfare scientists, veterinarians, social scientists, economists and extension personnel will work with an industry-relevant advisory board composed of stakeholders, farmers and technology developers who will provide prospective and retrospective advice on our research and extension. (2) We will survey farmers and veterinarians to understand their needs for PLF to manage pigs on farm and the drivers and constraints underlying their adoption of PLF. (3) We will interview influential stakeholders across the swine industry to examine their perceptions of and needs for PLF and the data it generates for uses ranging from genetic improvement to welfare certification. (4) We will survey farmers and consumers to assess their willingness-to-pay for PLF. (5) We will convey this information back to farmers and influencers in the swine industry to facilitate development and adoption of useful and usable PLF on farms to improve welfare. Outcomes: Fund a Post-Doctoral position and undergraduates.*
94. 2020. Stalder, K. J., **A. K. Johnson** and J. E. Koltes. Data science training for research groups involved in improving livestock sustainability, welfare, health, and production efficiency through

incorporating precision animal sciences technologies. ***Research/Extension.*** $1000. Office of the Vice President for Research, Iowa State University.

93. 2020. **Johnson, A. K. Farm Animal Care and Well-being Postdoctoral Research Associate.** Iowa Farm Bureau Federation ***Extension.*** $64,000. *Role*: *Wrote the funding request.*
92. 2021. **Johnson, A. K.** Iowa Pork Producers Association Fellowship for Mr. J. Yarian. ***Research; internal.*** $25,000. *Role*: *Wrote the funding request.*
91. 2020. Peschel, J**. A. Johnson**, N. Gabler, C. Rademacher, and J. Ross. SNORT: Swine Nutritional Observation and Routing Technology. ***Research*** Iowa Pork Producers Association. $79,141. *Role: Partly responsible for initial ideas and writing the grant. Objectives: The specific research objective of this work is to refine and validate predictive visual sensing and sensemaking algorithms in production facilities that indicate the feeding state of individual weaned pigs, which will inform and improve animal health and welfare management and production efficiency. These algorithms will be integrated into a software platform produced by our team called SNORT (Swine Nutritional Observation and Routing Technology). This new research work can also be expanded to include other components of the swine production process, specifically, for grow-finish and sows. Outcomes: Fund two PhD students for 1-year.*
90. 2020. Stalder, K. J., **A. K. Johnson**, L. A. Karriker, J. Peschel, B. Ramirez, P. Gorden, D. D. Loy, S. T. Millman, S. L. Hansen, L. L. Greiner, D. Koltes, E. A. Bobeck. Y. Sato, J. Shearer, J. E. Koltes, L. Schulz, D. Thompson, J. M. P. Bell, and A. Y. Kristmundsdottir. Improving Livestock Sustainability, Welfare, Health and Production Efficiency through Incorporating Precision Animal Sciences Technologies. ***Research*** (Internal). Faculty Learning Community Grant. $500. *Role: Partly responsible for initial ideas and writing the grant. Objectives: The long-term goal for this visionary program titled "Improving Livestock Sustainability, Welfare, Health, and Production Efficiency through Incorporating Precision Animal Sciences Technologies" is to identify teams to develop various approaches to address these issues in order to provide secure food production systems around the world. Outcomes: Identified participants will meet to identify research opportunities, vision and tangible plans to seek additional monies that meet CALS-PASE precision goals.*
89. 2020. Stambuk, C. R., **A. K. Johnson**, and E. R. Sundman. Nutritional enrichment to improve nursery pig behavior during weaning. ***Research.*** National Pork Board: Swine Research and Education Experience (SREE). $4,993. *Role: Partly responsible for initial ideas and writing the grant. Objectives: This grant is to fund a Undergraduate student (Ms. Grace Mercer) whom has an interest in making her profession within the U.S swine industry. Outcomes: Data from this project will be published in Ms. E. Sundman's Master's thesis, a peer review publication and findings will be included in the final report back to the National Pork Board as this work is part of Dr. J. Ross survivability grant (Grant #80).*
88. 2020. Ramirez, B., C. Rademacher, **A. Johnson**, L. Greiner, J. Peschel, D. Andersen J. Brown and K. Schwartz. Validation of Ventilation Shut Down Plus (VSD+) Methodology for Mass Depopulation. ***Research.*** National Pork Board. $168,000. *Role: Partly responsible for initial ideas and writing the grant. Objectives: This grant is to fund a Post-Doctoral position (Dr. S. Leonard) whom will become a future leader in the U.S. swine industry. Outcomes: Fund a post-doctoral position and to provide novel data that can shape the American Veterinary Medical Association de-population guidelines and to provide a detailed protocol for US swine producers.*
87. 2020. Stalder, K. J., **A. K. Johnson** and L. A. Karriker. 2020. Training the next generation of animal scientists with an emphasis on animal welfare, production systems and statistics. ***Research.*** National Pork Board. $60,000. *Role: Partly responsible for initial ideas and writing the grant. Objectives: This grant is to fund a student whom will become a future leader in the U.S. swine industry. Ms. G. Moeller will be continuing with her Ph.D. and these funds will support her educational efforts. Outcomes: Fund a Ph.D. student.*
86. 2019. Johnson, A. K. Farm Animal Care and Well-being Postdoctoral Research Associate. Iowa Farm Bureau Federation ***Extension.*** $65,000. *Role*: *Wrote the funding request.*

85. 2019. Millman, S. T., G. A. Dewell, **A. K. Butters-Johnson**, R. Dewell, J. Robbins, and R. L. Parsons*. Does social buffering enhance animal welfare and performance when beef calves are comingled in feedlot environments? ***Research.*** Agricultural and Food Research Initiative Competitive Grants Program. $499,651. *Role: Partly responsible for initial ideas and writing the grant. Will assist in experimental set up, data analysis and product formation. Objectives: Objective 1: Investigate effects of weaning on social behavior and affiliative bonds of pasture-reared beef calves. Objective 2: Identify effects of social buffering on behavior and physiologic responses of weaned beef calves to common environmental stressors. Objective 3: Evaluate impacts of social buffering on behavior, health and performance of comingled lightweight cattle on a commercial feedlot. Outcomes: Projected that two peer review papers, two abstracts, several extension media stories and one Animal Industry.*
84. 2019. Peschel, J., **A. Johnson**, D. Linhares, B. Ramirez, C. Rademacher and J. Ross. Improving animal health management production efficiency through automated visual sensing to monitor grow-finish pigs. ***Research.*** Iowa Pork Producers Association. $76,511. *Role: Partly responsible for initial ideas and writing the grant. Will serve on the POSC of the Graduate Student associated with this project (Major Professor Dr. Peschel). Will assist in product formation. Objectives: To develop innovative visual precision livestock farming (PLF) tools that will demonstrate the tracking and monitoring of individual grow-finish pigs to improve animal health and welfare management and production efficiency. Outcomes: Projected that one peer review paper, one abstract, several extension media stories and one Animal Industry. This work will create an Iowa State University MS thesis projected in 2022.*
83. 2019. **Johnson, A. K.,** and S. T. Millman. Equipment request: Video recording hardware and software for quantifiable animal welfare and behavior data. ***Research; internal.*** Vice Provost of Research. Cost Sharing - *Special Research Instrumentation Funding. $7,000. Role: Partly responsible for initial ideas and writing the grant. Oversee purchasing Observer main and coder license upgrades. Objectives: The COSRIF funding opportunity is reflective of our research goals. COSRIF notes "the goal of this competitive program of the Office of the Vice President for Research is to provide faculty, departments, and units with cost-sharing funds to purchase new equipment, replace or expand capabilities of existing equipment, or de novo assemble an integrated new instrument." Dr. Millman and Dr. Johnson have created and always embraced their strong, reliable, consistent and highly successful collegiate professional relationships with colleagues over numerous departments/units/colleges, which is facilitated by the current, but aged, behavioral video system and software. To continue and expand these successful collaborative partnerships, we urgently require additional and updated equipment. Outcomes: Equipment will be purchased in 2019.*
82. 2018. **Johnson, A. K.** Iowa Pork Producers Association Fellowship for Miss E. Akin. ***Research; internal.*** $25,000. *Role: Wrote the funding request.*
81. 2018. **Johnson, A. K.**, S. Azarpajouh*, S. T. Millman, M. D. Pairis-Garcia, K. J. Stalder, and S. L. Wisdom. How can euthanasia training modules based on the Personality Index test reduce caretaker related strain? ***Research.*** Iowa Pork Producers Association. $44,651. *Role: Partly responsible for initial ideas and writing the grant. Will be the major professor for Mr. J. Yarin (Masters student). Oversee mentoring, documents formulation and on-farm testing. Will oversee statically analysis and product completion. Objectives: To provide objective data on euthanasia-related strain and how it impacts caretakers' psychological well-being before and after euthanasia training modules based on the Personality Index Test. Outcomes: Projected that one peer review paper, one abstract, several extension media stories and one Animal Industry. This work will create an Iowa State University MS thesis projected in 2021.*
80. 2018. Ross, J. W., J. DeRouchey, M. Tokach, J. Woodworth, N. Gabler, **A. Johnson**, A. Keating, D. Linares, S. Millman, J. Patience, C. Rademacher, S. Schmitz-Esser, L. Schulz, K. Schwartz, K. Stalder, K. Stewart, and A. Chipman. An integrated approach to improve whole her pig survivability. National Pork Board. ***Research.*** $1,999,772. *Role: Partly responsible for initial ideas and writing the grant. Will be the major professor for Miss E. Sundham. Oversee mentoring, documents formulation and on-farm*

testing, will oversee statically analysis and product completion. Specifically, I will be working on Research Project 2.3.e. Determine utility of environmental enrichment to improve piglet weaning transition and maximize survival through finishing. Objectives: The overarching objective to identify causative factors contributing to swine mortality in commercial production and to develop and disseminate strategies and information that can be utilized to maximize pig survivability with the goal of reducing overall mortality nationally by 1 percentage point or more per year of the project. To achieve this audacious goal, our team will provide nation-wide leadership to the following specific objectives: Specific Objective 1: Evaluation of the management attitudes and economics associated with improving survivability in U.S. swine production. Specific Objective 2: Identification of putative mortality causes on U.S. sow farms with the development and implementation of targeted strategies to maximize survivability. Specific Objective 3: Reducing wean to finish mortality through the implementation of management strategies founded upon ongoing production research. Specific Objective 4: Develop nationally effective and sustainable extension, outreach and education resources and strategies to enable adoption and implementation of strategies that will reduce mortality in pork production. Outcomes: Projected that one peer review paper, one abstract, several extension media stories and one Animal Industry. This work will create an Iowa State University MS thesis projected in 2022.

79. 2017. **Johnson, A. K. Farm Animal Care and Well-being Postdoctoral Research Associate.** Iowa Farm Bureau Federation ***Extension.*** $65,000. *Role: Wrote the funding request.*
78. 2018. Peschel, J., **A. Johnson**, D. Correia-Lima-Linares, and C. J. Rademacher. Health prediction of individual animals in swine operations through automated visual sensing and behavioral sensemaking. National Pork Board. ***Research.*** $57,000. *Role: Partly responsible for initial ideas and writing the grant. Will oversee the behavioral collection and validation. Partially responsible for product completion. Objectives: The objective of this proposal is to design and validate visual precision tools that provide early, real-time notification of compromised nursery pigs. Outcomes: Projected that one peer review paper, one abstract, several extension media stories and one Animal Industry.*

SUCCESSFUL COMPETITIVE FUNDING: P & T REVIEW (OCTOBER 2010 TO JUNE 2011), ASSOCIATE PROFESSOR TO FULL PROFESSOR SUBMISSION ($9,278,912)

Grants related to the area of Dr. Butters-Johnson's PRS: ***Research*, *Extension*, & *Teaching***
Gift generously given to Dr. Butters-Johnson to support her program

77. 2018. Peschel, J., **A. Johnson** and S. Hansen. Health prediction of individual animals in confined beef operations through visual sensing and automated behavioral recognition. Iowa State Beef Checkoff Program. ***Research.*** $75,000. *Role: Partly responsible for initial ideas and writing the grant. Will assist with reviewing documents, behavioral data collection and modelling, help with data analysis and outcomes. Objectives: To design and study visual precision livestock tools that will allow for remote visual sensing and sensemaking of individual beef cattle in confined animal feeding operations in order to more quickly identify and treat injured or sick cattle. Outcomes: Projected that two peer review papers, an extension factsheet, two abstracts, several extension media stories and two Animal Industry Reports will be created. This work will create an Iowa State University MS thesis projected in 2020.*
76. 2017. Xin, S. Leonard, J. Stinn, **A. Johnson**, and T. Brown-Brandl. 2017. Assessing static and dynamic space needs of modern sows' Iowa Pork Industry Center. ***Extension. Research.*** $8,500. *Role: Partly responsible for initial ideas and writing the grant. Will assist with reviewing documents, help with data analysis and outcomes. Objectives: The objective of this study is to determine the static and dynamic space requirements for commercial sows. Static space refers to the space occupancy of the sow when standing and lying fully recumbent, whereas the dynamic space refers to the space occupancy when getting up, lying down, and turning around.*
75. 2017. Ross, J. K. Stalder, C. Rademacher, A. Keating, S. Millman, **A. Johnson**, K. Schwartz, D. Linares, N. Gabler and J. Patience. Identification of putative factors contributing to pelvic organ prolapse in sows. National Pork Board. ***Research.*** $108,595. *Role: Partly responsible for initial ideas and writing the grant. Will assist with reviewing documents, help with data analysis and outcomes.*

Objectives: The central objective of the IPIC team is to coordinately work with industry partners to establish a fundamental understanding of potential contributing sow pelvic organ prolapse factors. This central objective will be accomplished by the following specific objectives: Specific Objective #1: Establish a network of industry partners and sow farm managers (SFM) that will enable our team to seamlessly collect data on severely affected, moderately affected, and unaffected sow farms from varying geographic locations and production systems. Specific Objective #2: Develop an intensive herd and individual sow survey tool to objectively collect sow farm data and conduct statistical analysis to identify potential contributing factors to sow POP. Specific Objective #3: Establish a POP-associated communication and advisory network of producers, allied industry, university faculty and staff. Specific Objective #4: Establish an accessible repository of data, samples and information related to sow POP for use by the scientific communities interested in developing, providing, and evaluating mitigation strategies and solutions.

74. 2017. **Johnson, A. K. Farm Animal Care and Well-being Postdoctoral Research Associate.** Iowa Farm Bureau Federation ***Extension.*** $65,000. *Role: Wrote the funding request.*
73. 2017. Azarpajouh, S*., and **A. K. Johnson**. Dairy cow lameness and management strategies for AnS 336: Domestic Animal Behavior and Well-Being. ***Teaching.*** $2,946. **Funded on first submission.** Harman Endowment. *Role: Partly responsible for initial ideas and writing the grant. Will mentor the Post-Doc for project completion. Objectives: (1) create power point slides, script and to overlay a recorded audio (these efforts are to meet Quality matters1 expectations http://www.celt.iastate.edu/teaching/effective-teaching-practices/qm-tracks), (2) work with the Brenton Center to collect dairy cow video afflicted with varying degrees of lameness and (3) film Dr. J. Shearer (veterinarian and international expert in dairy cow lameness; https://vetmed.iastate.edu/users/jks) whom will clearly explain and complete foot trimming and pharmacological interventions to mitigate or reduce lameness and improve cow welfare. Outcomes: An interactive DVD to be used in the dairy cow lameness lab.*
72. 2017. **Johnson, A. K.,** S. Millman, K. Stalder, J. Ross, C. Jass and J. Stinn. Providing humane on-farm handling tools to move non-ambulatory grow-finish pigs. Iowa Pork Producers Association. ***Research.*** $43,957. *Role: Partly responsible for the grant writing and addressing reviewer comments. Oversight of Miss E. Akin's (MS) in the capacity as her major professor. Objectives: (1) evaluate two handling tools to move non-ambulatory grow-finish pigs and (2) evaluate two handling tools to move consciousness non-ambulatory market weight pigs at pre-sort and load out under commercial conditions in terms of pig welfare handling efficiency and worker safety. Outcomes: Projected that two peer review papers, a Pork Industry Information factsheet, two abstracts, several extension media stories and two Animal Industry Reports will be created. This work will create an Iowa State University MS thesis projected in 2019.*
71. 2017. Bobeck, E^., **A. Johnson** and H. Hu. Validating current broiler welfare auditing programs and advancing enrichment. US poultry. ***Research.*** $99,654. *Role: Partly responsible for initial ideas and writing the grant. Will serve on the MS students Program of Study. Objectives: (1) validate quantitative methods to evaluate broiler bird welfare, specific to production and (2) evaluation of experimental environmental enrichment using quantitative methods verified in objective 1. Outcomes: Projected that two peer review papers, two abstracts, several extension media stories and two Animal Industry Reports will be created. This work will create an Iowa State University MS thesis projected in 2019.*
70. 2017. Millman, S. T., **A. K. Butters-Johnson**, J. F. Coetzee, and J. A. Danielson. Tools to develop animal welfare knowledge and skills for the next generation of food animal veterinarians. NIFA; Higher Education Consortium. ***Teaching.*** $749,999. **Funded on first submission.** *Role: Partly responsible for the grant writing and addressing reviewer comments. Direct supervisor for one Post-doc for Objective 3. Objectives (1) develop an online 1-credit basic animal welfare course for freshman level veterinary students (2) create electronic problem-based-learning case studies for food production animals and an online repository to store these cases (3) develop two 1-week experiential courses (clinical rotations) focused on assessing swine and dairy cattle welfare for senior veterinary students (4) create and validate effective multiple-choice examination questions to evaluate student competency in animal*

welfare principles and practices and (5) develop an online navigational plan of existing educational opportunities to facilitate veterinary student specialization in animal welfare. Outcomes: Projected that six peer review papers, 12 abstracts, several extension media stories and five Animal Industry Reports will be created. Case studies and a novel veterinary welfare curriculum will be built and implemented.

69. 2016. **Johnson, A. K.** Tier One On-farm Euthanasia workshop. Iowa Pork Producer Association. ***Extension.*** $19,657. *Role: Wrote the white paper. Worked on the seven-module presentation and created the scrip. Planned to conduct three Beta tests of all material to extension and swine veterinary clients. Objectives: (1) develop a swine euthanasia module program that can be used by extension services throughout Iowa and the United States (2) increase the knowledge and skills of swine producers in regards to acceptable on-farm swine euthanasia technologies and practices and (3) create a self-sustaining, revenue-generating program within the state of Iowa and across the United States that will improve on-farm swine welfare. Outcomes: Projected plan to make the extension program available through the Iowa Pork Industry Center fall, 2017.*
68. 2016. Azarpajouh, S*., **A. K. Johnson**, J. F. Coetzee, L. Karriker, S. T. Millman and K. J. Stalder. Building a handling course to document sow locomotion when sows are afflicted with different naturally occurring lameness. Iowa Pork Producers Association. ***Research.*** $14,391. *Role: Partly responsible for the grant writing, addressing reviewer comments and input to all the outcomes. Direct supervisor for one Post-doc (Azarpajouh) and Co-supervisor with Dr. Karriker (Forseth). Objectives: build a handling course to document sow locomotion when sows are afflicted with different naturally occurring lameness. Outcomes: One ramp and one obstacle have been built and placed into the swine intensive laboratory at Iowa State University. Live sow work was completed fall 2016.*
67. 2016. **Johnson, A. K. Farm Animal Care and Well-being Postdoctoral Research Associate.** Iowa Farm Bureau Federation ***Extension.*** $59,000. *Role: Wrote the funding request.*
66. 2015. **Johnson, A. K. Farm Animal Care and Well-being Postdoctoral Research Associate.** Iowa Farm Bureau Federation ***Extension.*** $57,000. *Role: Wrote the funding request.*
65. 2015. **Johnson, A. K.,** S. Azarpajouh*, J. Bates, L. Karriker, J. Coetzee, K. Stalder, J. Calderón-Diaz and S. Millman. Validation of a lameness diagnostic manual and tools for naturally occurring sow lameness. Attorney General's Office. ***Research.*** $123,693. *Role: Partly responsible for the grant writing, addressing reviewer comments and input to all the outcomes. Direct supervisor for one Post-doc (Azarpajouh) and Co-supervisor with Dr. Karriker (Forseth). Objective: (1) provide detailed live and necropsy data for the five areas of lameness identified in the lameness diagnostic manual. Outcome: Results will be of enormous value to those involved in the swine industry, from the breeding companies, to swine veterinarians, extension support staff and the animal caretakers. After these results are analyzed we will then begin working on treatment plans that are designed for sows that have one of the five lameness etiologies. One abstract has already been accepted for oral presentation at the first Pig Welfare Symposium sponsored by the National Pork Board, November 2017. Projected to publish, two more abstracts, extension publications and one manuscript.*
64. 2015. Millman, S. T., **A. K. Johnson** and C. J. Rademacher. Common Swine Industry Audit (C.S.I.A.). Professional Animal Auditor Certification Organization. Inc., curriculum. ***Extension.*** $21,942. *Role: Partly responsible for the grant writing. Objective: Create an auditor training tool for the on-farm swine audit. Outcome: Responsible for the C.S.I.A. curriculum development related to transport/load out, caretaker training and facilitates. See under current committees #14 https://www.animalauditor.org/*
63. **Johnson, A. K.,** and S. Azarpajouh*. 2015. Swine Care Handbook. ***Extension.*** $10,000. *Role: Responsible for the grant writing. Partly responsible for the literature review and writing the white paper on the following section; handling sick and injured pigs, recognizing sickness behavior, facilities for sick and injured pigs, identification and record keeping for sick and injured pigs and environmental enrichment. In addition, a summary of how these topics are addressed in other standards around the globe. Butters-Johnson chaired Group 4 (responsible for these sections) which consisted of Mr. B. Drescher, Iowa State University, Ms. H. Grimes. Christiansen Farm, Ms. L. Coly (Colby Farms), Ms. L. Jones, JBS LLC and Mr. P Ayers, Maschoffs farms. Butters-Johnson and Azarpajouh were*

responsible for making final edits for submission to Ms. S. Webb, Director Animal Welfare National Pork Board. Objective: to provide an updated white paper on the science related to sick and injured pigs and environmental enrichment. Outcome: Current draft of the Swine Care Handbook available at: Per. Ms. S. Webb Director Animal Welfare at the National Pork board. The plan is to publish the version by the end of 2017. http://swinecarehandbook.pork.org/wp-content/uploads/2015/11/SCH-draft-150826.pdf

62. 2015. Calderón-Diaz, J. A**., K. Johnson**, K. J. Stalder, A. K. Johnson and J. D. Stock. Dynamic space requirements for non-lame and lame sows determined by lying-standing-lying sequence profile. National Pork Board. ***Research.*** $47,045. *Role: Partly responsible for the grant writing and input to all the outcomes. Direct supervisor for one Post-doc (Azarpajouh). Objectives: (1) calculate dynamic space requirements for lame and non-lame sows determined by their lying-standing-lying postural sequence profile (2) characterize and pictorially depict the lying-standing- lying postural sequence profile and (3) identify other leg and toe and dew claw risk factors for non-lame and lame multiparous sows. Outcome: Peer review abstracts #106, 107. Peer reviewed extension publications #150, 155, 156, 157. One MS thesis completed-served on program of study #25.*
61. 2015. Stalder, K. J., **A. K. Johnson**, J. A. Calderón-Diaz, T. J. Baas, J. D. Stock and M. F. Rothschild. Replacement gilt candidate feet, leg and reproductive trait evaluation using digital analysis and visual observation. National Pork Board. ***Research.*** $89,661. *Role: Partly responsible for the grant writing and input to all the outcomes. Direct supervisor for one Post-doc (Azarpajouh). Objective: evaluate gilt feet and leg structural soundness traits using digital imagery to enhance gilt selection processes. Outcome: Peer review abstracts #104. Peer reviewed extension publications #154. Iowa State University Ph.D. dissertation projected in 2019, two peer reviewed extension publications and three peer review papers.*
60. 2015. Pairis-Garcia, M., J. Loup-Rault, G. Coleman, **A. Johnson**, S. Hartline, R. Anthony, and K. George. Development of an interactive training app for timely and humane on-farm euthanasia in pre-weaned piglets. National Pork Board. ***Research.*** $182,695. *Role: Partly responsible for the grant writing and input to all the outcomes. Objectives: (1) identify quantitative and qualitative decision criteria for on-farm euthanasia of pre-weaned piglets (2) develop a proof of concept training app to deliver educational material on timely decisions for euthanasia of pre-weaned piglets to employees and (3) identify via the proof of concept training app, stockman characteristics that influence the euthanasia decision-making process. Outcomes: Peer reviewed journal article #90. The Ohio State University MS thesis was completed in 2017 under the guidance of Dr. Pairis-Garcia.*
59. 2015. Xin, H., T. Brown-Brandl, J. Stinn, J. Vallet, **A. Johnson**, T. Shepherd. Enhancing the health and well-being of pre-weaning piglets. Agricultural and Food Research Initiative Competitive Grants Program – Foundational Program. ***Research.*** $500,000. *Role: Partly responsible for the grant writing and will provide input to all the outcomes. Serving on the Ph.D. students Program of Study. Objectives: (1) evaluate the impact of different farrowing crate sizes and layouts (conventional crate, expanded creep area, expanded sow area) with one vs. two localized heat sources on pre-weaning piglet health and mortality (2) quantify the postural behaviors of sows before parturition and during lactation as affected by crate size and localized heat source location; and distribution of piglets in the crate and (3) assess the relationship between surface temperature of the piglets and their health status. Outcomes: Projected that abstracts, peer review papers, several media extension stories will be published. Iowa State University Ph.D. dissertation projected in 2018.*
58. 2014. Stalder, K., R. Baker. **A. Butters-Johnson** and J. Dickson. Livestock truck washing station evaluation and identification of best practices. United States Department of Agriculture: Animal & Plant Health Inspection Service. (APHIS). ***Extension/Research.*** $204,433. *Role: Partly responsible for the grant writing and input to all the outcomes. Served on Miss A. Danielson's MS Program of Study. Objectives: (1) identify all livestock truck washing states in the main pig states (2) conduct a survey of what service livestock truck washers offered in Iowa (3) determine the effectiveness of truck washing services and (4) create a web page and best management practices brochure for the swine industry.*

Outcomes: Web page created and made available at https://www.ipic.iastate.edu/truckwash.html Peer reviewed abstract #96. One MS thesis completed-served on program of study #22.

57. 2014. Pairis-Garcia, M., **A. K. Johnson,** and K. Stalder. Optimizing on-farm management of non-infectious sow lameness during the farrowing and lactation period. National Pork Board. ***Research.*** $71,989. *Role: Partly responsible for the grant writing and input to all the outcomes. Objective: assess the effects of rubber matting on reproductive performance, non-infectious lameness severity and recovery, feed intake, pain sensitivity and behavior of lame and non-lame sows during farrowing and lactation. Outcomes: Peer reviewed journal article #83. Peer reviewed extension publication #153.*
56. 2014. **Johnson, A. K. Farm Animal Care and Well-being Postdoctoral Research Associate.** Iowa Farm Bureau Federation. ***Extension.*** $50,000. *Role: Wrote the funding request.*
55. 2013. **Johnson, A. K. Farm Animal Care and Well-being Postdoctoral Research Associate.** Iowa Farm Bureau Federation. ***Extension.*** $50,000. *Role: Wrote the funding request.*
54. 2013. Millman, S., **A. Johnson** and A. O'Connor. Caring for compromised swine: An assessment of swine marketed through buying stations and development of fitness for transport guidelines. National Pork Board. ***Research.*** $69,715. *Role: Partly responsible for the grant writing and input to all the outcomes. Objectives: (1) quantify the behavioral and physiological responses of at-risk and normal market swine to standardized handling and social mixing stress tests (2) identify additive effects of sequential handling and social mixing on at-risk and normal market swine and (3) assess responses of at-risk and normal market swine to industry-typical handling and transportation stressors at a commercial buying station. Outcomes: Partly funded Dr. Millman's Post-Doc (McGee). Peer reviewed extension publication #151. Peer review abstracts #94, 95 and 101. Projected one peer review paper to be submitted to the Journal of Animal Science.*
53. 2013. Coetzee, J., **A. Johnson**, L. Karriker, S. Sander, L. Wulf, J. Bates and D. Borts. A study to develop and validate assays to measure and compare four circulating neuropeptides as objective pain biomarkers in piglets. National Pork Board. ***Research.*** $133,680. *Role: Partly responsible for the grant writing and input to all the outcomes. Objective: to create porcine specific physiological assays for four neuropeptides that are released during pain. Outcomes: Projected that an abstract and a peer review paper will be created. Hypothesized that four validated porcine specific physiological assays will be available for future use.*
52. 2013. Stalder, K. J., and **A. K. Johnson**. Replacement of objective quantitative tools to evaluate lameness in swine. ISUANR Smithfield foundation funds. ***Research.*** $22,847. *Role: Partly responsible for the grant writing and input to all the outcomes. Objectives: to determine the minimum time to detect sow lameness using an embedded microcomputer-based force plate system. Outcomes. Peer reviewed abstract #75 132, Peer reviewed extension #133, 134. Iowa State University MS thesis completed in 2013 Mr. B. McNeal, Major Professor Dr. K. Stalder.*
51. 2013. O'Connor, A., **A. K. Johnson**, S. T. Millman, J. McKean, J. Coetzee, and L. A. Karriker. Proposal to the National Pork Board to host a workshop on: Pain management for the neonatal piglet. National Pork Board. ***Extension.*** $123,141. *Role: Partly responsible for the grant writing, pre-workshop literature review using the GRADE procedure, attendance to a 3-day workshop and input to all the outcomes. Objective: to create recommendations for pan mitigation in 1 to 28-day old piglets undergoing tail docking, castration, identification and teeth clipping. Outcomes: Peer review journal articles # #76, 77. Peer reviewed extension publications #109.*
50. 2013. Sadler, L. J., and **A. K. Johnson.** Touch N Talk DVD distribution. Iowa Beef Center ***Extension.*** $1,550. *Role: Partly responsible for identifying clientele to send the DVD to. Outcome: 200 DVD's were sent to all ISU field extension specialists, copies were sent to Iowa Farm Bureau Federation, Iowa Cattleman Association and B and B club members.*
49. 2013. Sadler, L., **A. Johnson**, M. Ruble. Request for funds to film a laboratory in AnS 336: Domestic Animal Behavior and Well-Being. Eldred and Donna Harman Endowment and Edith D. Lagerstrom. ***Teaching.*** $2,350. Role: *Partly responsible for the creation of the white paper, script creation, assisted with the filming at the Beef Teaching farm, editing the DVD content and input to all the outcomes. Worked with post-doc Dr. Sadler and The Brenton Center. Objectives: learn how to use a humane*

handling technique allowing calves to become comfortable with a halter and human. Outcome: Touch N Talk DVD.

48. 2013. Sadler, L. J., and **A. K. Johnson**. Touch N Talk DVD distribution. Edith D. Lagerstrom Beef Cattle Management and Entrepreneurship Fund. ***Extension.*** $2,350. *Role: Partly responsible for identifying clientele to send the DVD to. Outcome: 200 DVD's were sent to all ISU field extension specialists, copies were sent to Iowa Farm Bureau Federation, Iowa Cattleman Association and B and B club members.*
47. 2013. Millman S. T., L. J., Sadler, and **A. K. Johnson**. Development of an integrated swine euthanasia-training module to benefit swine producers in Iowa. Iowa State University-Agriculture and Natural Resources: Smithfield foundation funds. ***Extension.*** $65,480. *Role: Partly responsible for the grant writing and input to all the outcomes. Objectives: (1) to create a training euthanasia curriculum for swine veterinarians and field extension specialist (2) to host a workshop. Outcomes: A one day training workshop was held December 2013. A total of 15 attendees spent half a day in the classroom working through the curriculum and half a day at the Veterinary Diagnostics Laboratory to work through a euthanasia web lab.*
46. 2012. Millman, S., G. Dewell, R. Dewell, J. Shearer, **A. Johnson**, L. Karriker, H. Xin, M. Sutherland, R. Anthony and J. Coetzee. An examination of argon gas for on-farm anesthesia and euthanasia of livestock. Agricultural and Food Research Initiative Competitive Grants Program - Foundational Program. ***Research.*** $480,564. **Funded on first submission.** *Role: Partly responsible for the grant writing and input to all the outcomes. Objectives: (1) explore piglet responses to exposure to and induction of insensibility with argon gas using condition place preference laboratory techniques (2) explore the effectiveness of argon gas euthanasia when applied to pigs of compromised respiratory capacity (3) determine the effectiveness of argon gas anesthesia for mitigating pain associated with castration and tail docking of piglets (4) evaluate the feasibility of argon gas technology for euthanasia of morbid or unwanted neonatal calves and (5) to investigate animal caretaker and public attitudes regarding acceptable euthanasia technologies for neonatal swine and calves. Outcomes: Peer reviewed papers # 57, 58, 59. Peer reviewed abstracts 64, 87, 88, 89. Peer reviewed extension publications #108, 111, 112. One MS thesis completed-served on program of study #17 and one Ph.D. #14.*
45. 2012. **Johnson, A. K.,** S. Millman, L. Karriker and K. Stalder. Developing validated and objective industry-ready tools to assess joint pain manifestation and lameness in the sow. Iowa Pork Producers Association. ***Research.*** $30,794. *Role: Partly responsible for the grant writing and input to all the outcomes. Major Professor for one MS and one Ph.D. student. Co-supervisor for one technician. Creation of all the IACUC's and responsible for project management. Objectives: (1) using an innovative chemical model of synovitis to create populations of pigs that are experiencing pain manifested as lameness and validate a list of objective assessment tools to determine which of those tools discriminate between animals in a painful and non-painful state (2) utilize the most sensitive tools identified in objective 1 to quantify the analgesic effect of two non-steroidal anti-inflammatory drugs (NSAIDs), flunixin-meglumine and meloxicam using the chemical synovitis model and (3) utilize the most effective NSAID from objective 2 to quantify pig preference for bedding during convalescence from lameness. Outcomes: Peer review journal articles #49, 64, 65, 66, 67, 79, 80, 81, 82, 88, 89. Peer reviewed abstracts #56, 57, 65, 68, 69, 72, 73. Peer review extension publications #113, 116, 123, 126, 127, 139. Iowa State University MS thesis completed in 2013 #7 and Ph.D. dissertation completed in 2014 #8. Dr. Butters-Johnsons was the major professor for both students.*
44. 2011. **Butters-Johnson, A. K**., K. J. Stalder, S. Millman, L. A. Karriker and J. Coetzee. Developing validated and objective industry-ready tools to assess joint pain manifestation and lameness in the sow. Agricultural and Food Research Initiative Competitive Grants Program - Foundational Program. ***Research.*** $700,000. **Funded on first submission.** *See details for #45.*
43. 2011. **Johnson, A. K.** Elanco Animal Health. ***Gift***. $35,000.
42. 2011. **Johnson, A. K.** Boehringer Ingelheim. ***Gift***. $38,997.
41. 2011. Stalder, K., G. Sun, S. Hoff. L. Karriker **A. Johnson**, and T. Parsons*. Diagnosis of sow lameness using the microcomputer-based force plate system and pattern recognition methods. National Pork

Board. ***Research.*** $68,069. *Role: Partly responsible for the grant writing and input to all the outcomes. Objective: can a chemically induced lameness model, can the microcomputer-based force plate system detect lameness earlier than scoring systems. Outcomes: See details #45.*

40. 2011. Tuggle, C. K, **A. Johnson**, J. McKean, A. Tait, and M. Wannemuehler. Effects of Exposure to Organic Dust on Macrophage Function: Implication for Swine Respiratory Health. Iowa Pork Producers Association. ***Research.*** $59,218. *Role: Partly responsible for the grant writing.*
39. 2011. Patience, J. F., L. Anderson, R. Campbell, J. Dekkers, N. Gabler, H. Gilbert, E. Huff-Lonergan, **A. Butters-Johnson**, B. Kerr, P. Liu, S. Lonergan, J. Mabry, D. Nettleton, M. Rothschild, R. Rowland, J. Siegford, M. Tokach, C. Tuggle, A. van Kessel, and T. Weber. Enhancing sustainability and competitiveness of the U.S. pork industry by improving nutrient utilization and feed efficiency through innovative scientific and extension approaches. Agricultural and Food Research Initiative Competitive Grants Program – Global Food Security. ***Research.*** $4,790,000. **Funded on first submission.** *Role: Partly responsible for the grant writing and input to all the outcomes. Co-major Professor (with Dr. N. Gabler) for one Ph.D. student and supervisor for two post-docs (Sadler & Azarpajouh). Objectives: (1) quantify the performance of pigs selected for increased feed efficiency under corn-soybean diets when fed lower quality by-product ingredients (higher fiber, lower fat) (2) evaluate the ability of pigs selected for increased efficiency to cope with behavioral, physiological and immunological stressors (3) develop industry-ready tools to easily and effectively identify and select more efficient pigs (4) increase pork producers' awareness of the factors influencing feed efficiency and strategies available to achieve improvement and (5) ensure the rapid and effective implementation of new technologies to improve feed efficiency both nationally and internationally. Outcomes: Peer reviewed journal articles #73, 74, 84. Peer reviewed abstracts #66, 67, 76, 80, 90, 91, 98. Peer reviewed extension publications # 114, 115, 121, 137, 138, 146, 147, 152. Iowa State University Ph.D. completed 2015. Dr. Butters-Johnson co-majored the student with Dr. N. Gabler #1.*

SUCCESSFUL COMPETITIVE FUNDING: ASSISTANT PROFESSOR 2005 TO P & T SUBMISSION OCTOBER 2010 ($1,029,812)

38. 2010. **Johnson, A. K.,** E. Huff-Lonergan, D. Kenealy, J. Cunnick and H. Tyler. Peer review of teaching: Creation of a formative assessment tool for the Department of Animal Science. Center for Excellent in Learning and Teaching: Teach Award. Iowa State University. ***Teaching*** $2.000.
37. 2010. Stalder, K., **A. K. Johnson**, L. A. Karriker, and J. Patience. To evaluate the efficacy of a new product in ameliorating osteochondritis in pigs. U.S. Borax, Funding. ***Research.*** $28,376.
36. 2010. **Johnson A. K.** Establishing bedding and boarding requirements for finisher pigs through scientific validation. National Pork Board ***Research.*** $42,088.
35. 2010. **Johnson A. K.** ISU ADVANCE. National Science Foundation. ***Teaching.*** $300.
34. 2010. McGlone, J. J., and **A. K. Johnson.** Establishing bedding and boarding requirements for finisher Pigs through scientific validation. ***Research.*** $42,088. National Pork Board.
33. 2010. **Johnson, A. K.** Elanco Animal Health. ***Gift.*** $35,000.
32. 2010. **Johnson, A. K.** Boehringer Ingelheim. ***Gift.*** $17,556.
31. 2009. **Johnson, A. K.** Elanco Animal Health. ***Gift.*** $26,833.
30. 2009. Millman, S. T., R. A., Brooks, **A. K. Johnson,** and L. A Karriker. Iowa swine welfare school – a hands-on education and training program for low stress handling and animal care. Innovative Swine Industry Enhancement Grant Program, Office of the Attorney General. ***Extension.*** $28,700.
29. 2009. Karriker, L. A., K. Stalder, R. Fitzgerald, **A. Johnson**, and H. Coetzee. Using objective mechanical and physiologic measurements to build robust producer tools for detecting, scoring and treating lameness in sows. National Pork Board. ***Research.*** $96,724.
28. 2009. Karriker, L. A., S. Millman, K. J. Stalder and **A. K. Johnson**. Objective assessment tools and pain management for lame sows. Iowa Pork Producers Association. ***Research.*** $25,000.
27. 2009. Millman, S., R. Brooks, L. A. Karriker, **A. K. Johnson**, and K. J. Stalder. A hands-on education and training module for euthanasia in the Iowa Swine Welfare School. Iowa Pork Producers Association. ***Extension.*** $14,356.

26. 2009. **Johnson, A. K.**, S. Millman, L. A. Karriker, and K. J. Stalder. Using objective behavioral measurements to build robust producer tools for detecting, scoring and treating lameness in sows. Iowa Pork Producers Association. ***Research.*** $20,000.
25. 2009. **Johnson, A. K.**, M. Ritter, J. Moody and K. J. Stalder. The influence of small versus large pens on the welfare of the grow-finisher pig. Iowa Pork Producers Association. ***Research.*** $12,239.
24. 2008. 2009. **Johnson, A. K.** Elanco Animal Health. ***Gift.*** $26,833.
23. 2008. **Johnson, A. K.**, M. Ritter, and K. J. Stalder. The influence of facility design and pre-sorting on the stress response and transportation losses of the market weight pig. Iowa Pork Producer Association. ***Research.*** $16,222.
22. 2007. **Johnson, A. K**., K. Stalder, and L. Karriker. Evaluation of the relationship between hoof abnormalities and breeding herd female longevity when housed in gestation and farrowing stall. National Pork Board. ***Research.*** $50,253.
21. 2007. **Johnson, A. K.**, S. T. Millman, A. Zanella, and A. O'Connor. Across species, across disciplines and across borders: Opportunities for animal welfare and epidemiology scientists. National Research Initiative: Cooperative State Research, Education and Extension. ***Extension.*** $10,000.
20. 2007. **Johnson, A. K.**, S. T. Millman, and A. O'Connor. Across species, across disciplines and across borders: Opportunities for animal welfare and epidemiology scientists. Colleges of Agriculture & Veterinary Medicine, Iowa State University. ***Extension.*** $6,000. ****Award was allocated to an account within the Veterinary Diagnostic and Animal Production Medicine of the College of Veterinary Medicine.***
19. 2007. **Johnson, A. K.**, S. T. Millman, and A. O'Connor. Across species, across disciplines and across borders: Opportunities for animal welfare and epidemiology scientists. Department of Epidemiology and Population Medicine at the University of Guelph, Canada. ***Extension.*** $3,000. ****Award was allocated to an account within the Veterinary Diagnostic and Animal Production Medicine of the College of Veterinary Medicine.***
18. 2007. Marchant-Forde, J. N., D. C. Lay, R. M. Marchant-Forde, **A. K. Johnson**, and J. P. Garner. Understanding and reducing aggression using pre-exposure when sows are mixed in a grouped gestation system. National Pork Board. ***Research.*** $75,952. ****Award was held through the USDA-ARS center, located at Purdue University IN.***
17. **Johnson, A. K.**, S. T. Millman, and A. O'Connor. Across species, across disciplines and across borders: Opportunities for animal welfare and epidemiology scientists. Ontario Veterinary School, Canada. ***Extension.*** $2,000. ****Award was allocated to an account within the Veterinary Diagnostic and Animal Production Medicine of the College of Veterinary Medicine.***
16. 2007. **Johnson, A. K.** Topics in Farm Animal Environmental Physiology, Behavior, Stress and Welfare. AnS 537A-F. Distance education program grant: College of Agriculture and Life Sciences at Iowa State University. ***Teaching.*** $3,000.
15. 2007. **Johnson, A. K.** Land O' Lakes. ***Gift.*** $20,160.
14. 2007. **Johnson, A. K.** Boehringer Ingelheim. ***Gift.*** $10,000.
13. 2007. **Johnson, A. K.** Iowa Pork Producers Association. ***Gift.*** $2,028.
12. 2007. **Johnson, A. K.** Elanco Animal Health. ***Gift.*** $7,724.
11. 2007. Dekkers, J. C., **A. K. Johnson,** M. Spurlock, C. K. Tuggle, S. Lonergan, E. Huff-Lonergan, and L. Anderson. Identification of biological factors responsible for differences in feed efficiency between selection lines for residual feed intake. National Pork Board. ***Research.*** $101,949.
10. 2007. Marchant-Forde, J. N., D. C. Lay, R. M. Marchant-Forde, **A. K. Johnson**, and J. P. Garner. Understanding aggression when sows are mixed in indoor and outdoor housing systems. Animal Compassion Foundation. ***Research.*** $35,000. ****Award was held through the USDA-ARS center, located at Purdue University IN.***
9. 2007. Stalder, K., L. Karriker, **A. K. Johnson**, T. Baas, J. W. Mabry, M. F. Rothschild, and J. McKean. Association of compositional traits and structural soundness with the ability of commercial line of sows to complete parities four and five. National Pork Board. ***Research.*** $43,173.

8. 2006. **Johnson, A. K.**, T. J. Baas, M. Hogberg and M. S. Honeyman. To create a production facility, which will encompass swine well-being research, teaching and outreach excellence using sound scientific through a multi-disciplinary approach. Iowa Pork Producer Association. ***Research.*** $80,000.
7. 2006. **Johnson, A. K.**, T. J. Holck., R. Edler, and R. Baker. To determine drinking behavior in nursery pigs when water is withheld for 15 hours versus not with holding. Boehringer Ingelheim Vetmedica, Inc. ***Research.*** $13,663.
6. 2006. **Johnson, A. K.**, K. Stalder, L. Karriker, and J. Hill. Comparison of chute design on the ease of loading finisher pigs. How does this affect their performance, welfare parameters and overall economics to the producer? National Pork Board. ***Research.*** $41,855.
5. 2006. **Johnson, A. K.**, K. Stalder, L. Karriker, N. Berry and J. Hill. Chute design for the finisher pig at the time of load out to market? Iowa State University, Vice provost for Research. ***Research.*** $4,353. ****This award was through internal funding within the College of Agriculture and Life Sciences.***
4. 2006. **Johnson, A. K.** Preparation for a welfare assessment. National Pork Board. ***Extension.*** $500. ***Award was submitted directly from the National Pork Board to the Federation of Animal Science Society (FASS).***
3. 2006. **Johnson, A. K.** Current issues of Animal Well-Being: Public perception vs. science. National Pork Board. ***Extension.*** $1,200. ****Award was submitted directly from the National Pork Board to the Federation of Animal Science Society (FASS).***
2. 2006. Bregendahl, K., **A. K. Johnson,** C. Stahl, and G. Brant. Evaluation of a fine-limestone, low-energy molt program: Effects on egg production, animal behavior and welfare before, during and after a fasting or non-fating molt. Iowa Egg Council. ***Research.*** $28, 329. ****Award was allocated to Dr. K. Bregendahl foundational account.***
1. 2006. Bregendahl, K., **A. K. Johnson,** C. Stahl, and G. Brant. Evaluation of a fine-limestone, low-energy molt program: Effects on egg production, animal behavior and welfare before, during and after a fasting or non-fating molt. ILC, Resources. ***Research.*** $55,358. ****Award was allocated to Dr. K. Bregendahl foundational account.***

*****Grants awarded during promotion and tenure (2005 to 2010) do not report role, objectives and outcomes as this was evaluated back in 2010. *****

Summary table: Grants directed or co-directed *Research Extension Teaching Gift.*

Total $ funded as PI at Iowa State University since receiving promotion (2018 to current)	**384,651**
Total $ funded as CO-PI at Iowa State University since receiving promotion (2018 to current)	**2,795,173**
Total $ funded as PI at Iowa State University since receiving tenure & promotion (2011 to 2017)	**1,283,098**
Total $ funded as CO-PI at Iowa State University since receiving tenure & promotion (2011 to 2017)	**7,995,814**
Total $ funded as PI at Iowa State University during promotion and tenure process (2005 to 2010; submission)	**454,807**
Total $ funded as CO-PI at Iowa State University during promotion and tenure process (2005 to 2010; submission)	**575,005**

GRANT SUBMISSIONS AWAITING DECISION FOR 2021 ($100,000)

1. Millman S. T., **A. K. Johnson**, T. M. Widowski, and M. Hunniford. An evidence-based approach to laying hen welfare assessment. *Egg Industry Center*. Pre-proposal (12/03/21). $100,000.

PATENTS

1. Provisional Patent: Laser Enrichment Device, System, and Method for Poultry. Provisional patent filed October 2018. Full patent filed October 2019.

EXTENSION (25% OF APPOINTMENT)

Dr. Butters-Johnson publishes under her maiden name of Johnson
Some publications the author will be A. Johnson and for others it will be A. K. Johnson
ISI has not provided impact factors for 2017, so 2016 impact factor have been provided
****Notation placed by name that I was serving as major or co-major professor, serving on their Program of Studies Committee (POSC) or was their direct supervisor***
^Notation placed by name that I was serving as Faculty mentor
#Notation on publications placed by name, I served as corresponding author

PEER REVIEWED EXTENSION PUBLICATIONS: PROFESSOR (JULY 2018) TO SEVEN-YEAR REVIEW 2024 (N = 15)

186. Peschel, J., **A. Johnson**, D. Linhares, B. Ramirez, C. Rademacher and J. Ross. 2020. Improving Animal Health Management and Production Efficiency through Automated Visual Sensing to Monitor Grow-Finish Pigs. National Pork Board Final Report received 12/01/2020.
185. Bobeck, E^. and **A. Johnson**. 2019. Iowa State researchers find lasers can be used to improve poultry health and productivity. Land Grant Impacts. https://landgrantimpacts.tamu.edu/impacts/search
184. Akin, E., E*., **A. K. Johnson**, J. W. Ross, S. T. Millman, K. J. Stalder, C. D. Jass, and J. P. Stinn. 2019. Handling tools to move non-ambulatory pigs that comply with the Common Swine Industry Audit. Pork Information Gateway. PIG 05-02-02. http://porkgateway.org/resource/handling-tools-move-non-ambulatory-pigs-comply-common-swine-industry-audit/
183. Bobeck, E^., **A. Johnson** and H. Hu. 2019. Validating current broiler welfare auditing programs and advancing enrichment. US poultry. US Poultry Final Report received 08/01/2019. Available at: http://www.uspoultry.org/research/resproj/PROJ_703.html
182. Ross, J. K. Stalder, C. Rademacher, A. Keating, S. Millman, **A. Johnson**, K. Schwartz, D. Linares, N. Gabler and J. Patience. Identification of putative factors contributing to pelvic organ prolapse in sows. National Pork Board. National Pork Board final report received 07/01/2019. Available at: https://www.pork.org/research/identification-putative-factors-contributing-pelvic-organ-prolapse-sows/
181. Meyer, M*., **A. Johnson** and E. Bobeck^. 2019. Methods Validated in a Research Setting including Modifications for Producers to Measure On-Farm Commercial Broiler Welfare. Animal Industry Report R3326. https://www.iastatedigitalpress.com/air/article/id/7186/
180. Meyer, M*., **A. Johnson** and E. Bobeck^. 2019. Validated Broiler Welfare Measures Recommended to Researchers. Animal Industry Report R3327. https://www.iastatedigitalpress.com/air/article/id/7187/
179. Akin, E*., J. Ross, K. Stalder, A. Millman, C. Jass, J. Stinn, and **A. Johnson**. 2019. Movement Ease for Grow-Finish Pig Cadavers On-Farm using a Sked, Deer Sled, and Modified Deer Sled. Animal Industry Report R3337. https://www.iastatedigitalpress.com/air/article/id/7197/
178. Meyer, M*., J. Jespersen, **A. Johnson**, and E. Bobeck^. 2019. Novel Walking Platform to Assess Lameness in Broilers. Animal Industry Report R3325. https://www.iastatedigitalpress.com/air/article/id/7185/
177. Akin, E*., J. Ross, K. Stalder, S. Millman, C. Jass, J. Stinn, and **A. Johnson**. 2019. Employee survey to determine movement ease for grow-finish pig cadavers' on-farm using a sked, deer sled and modified deer sled. Animal Industry Report R3348. https://www.iastatedigitalpress.com/air/article/id/8037/
176. Coetzee, J., **A. Johnson**, L. Karriker, S. Sander, L. Wulf, J. Bates, and D. Borts. 2019. A study to develop and validate assays to measure and compare four circulating neuropeptides as objective pain biomarkers in piglets. National Pork Board Final Report received 06/16/2010. http://research.pork.org/Results/ResearchDetail.aspx?id=1484
175. Pairis-Garcia M., J. Loup-Rault, G. Coleman, **A. Johnson**, S. Hartline, R. Anthony, and K. George. 2018. Development of an interactive training app for timely and humane on-farm euthanasia in pre-

weaned piglet. National Pork Board final report received 10/03/2018. https://www.pork.org/research/devleopment-interactive-trainning-app-timely-farm-euthanasia-pre-weaned-piglets/

174. Stalder, K. J., **A. K. Johnson**, J. A. Calderon-Diaz, T. J. Baas, J. D. Stock, and M. F. Rothschild. 2018. Replacement gilt candidate feet, leg and reproductive trait evaluation using digital analysis and visual observation. National Pork Board final report received 02/20/2019. https://www.pork.org/research/replacement-gilt-candidate-feet-leg-reproductive-trait-evaluation-using-digital-analysis-visual-observation/
173. Forseth, A*., S. Azarpajouh*, J. Stock*, R. Parsons*, **A. Johnson**, L. Karriker, S. Millman, and K. Stalder. 2018. Validation of a lameness diagnostic manual and tools for naturally occurring sow lameness. 2018. Attorney General of Iowa. Final report received July 1, 2018. The Attorney General's Office if Iowa do not make this report public (*personnel communication with Mr. M Wallin*).
172. Azarpajouh, S*., **A. K. Johnson,** J. F. Coetzee, L. A. Karriker, S. T. Millman and K. J. Stalder. Building a handling course to document sow locomotion when sows are afflicted with different naturally occurring lameness. 2018. National Pork Board Final Report received 06/22/2018. https://www.pork.org/research/building-handling-course-document-sow-locomotion-sows-afflicted-different-naturally-occurring-lameness/

PEER REVIEWED EXTENSION PUBLICATIONS: P & T REVIEW (OCTOBER 2010 TO JUNE 2011), ASSOCIATE PROFESSOR TO FULL PROFESSOR SUBMISSION) (N = 102)

171. Storlie, M., C. Rademacher, **A. Johnson** and J. Eggers. 2018. Common Swine Industry audit: frequently asked questions. https://www.ipic.iastate.edu/information/CSIAFAQ.pdf
170. Azarpajouh, S*., J. Colpoys*, E. Arkfeld, N. Gabler, **A. Johnson**, J. Dekkers, E. Huff-Lonergan, S. Lonergan, J. Patience and K. Stalder. 2018. Behavioral associations during a human approach test and performance of barrows divergently selected for residual feed intake. Animal Industry Report R3265.
169. Azarpajouh, S*., J. Colpoys*, E. Arkfeld, N. Gabler, **A. Johnson**, J. Dekkers, E. Huff-Lonergan, S. Lonergan, J. Patience and K. Stalder. 2018. Behavioral associations during a novel object test and performance of barrows divergently selected for residual feed intake. Animal Industry Report R3266.
168. English, J., **A. Johnson**, K. Stalder, L. Karriker., M. Pairis-Garcia and C. Bruns. 2018. Evaluation of how anesthesia affects body temperature in sows using infrared thermography. Animal Industry Report R3267.
167. Weimer, S*., **A. Johnson**, K. Stalder, L. Karriker and T. Fangman. 2018. How does on-farm nursery pig approachability pre- and post-vaccination? Animal Industry Report R3270.
166. Weimer, S*., **A. Johnson**, K. Stalder, L. Karriker and T. Fangman. 2018. How does the type of vaccine affect pig approachability per-and post-vaccination? Animal Industry Report R3269.
165. Iske, C*., C. Morris, and **A. Johnson**. 2018. Composition of eleven pig by products. Animal Industry Report R3268.
164. Deal, M*., and **A. K. Johnson**. 2018. ANS 490-H; Part 1; Building a potable environmentally enriched wagon for a North American Porcupine. Animal Industry Report R3262.
163. Deal, M*., and **A. K. Johnson**. 2018. ANS 490-H; How to educate the public while providing a potable environmentally enriched wagon to a North American Porcupine. Animal Industry Report R3263.
162. Croney, C., J. Mench, W. Muir, R. Anthony, G. Golab, C. Hofacre, **A. K. Johnson**, J. L. Lusk, O. Widmar, A. P. Schinckel, J. Shearer, J. Swanson, Y. V. Thaxton, and G. Varner. 2018. Scientific, ethical and economic aspects of farm animal well-being. CAST Task Force Report No. 143. Published by the Council for Agricultural Science and technology, Ames, Iowa. ISBN 978-1-887383-37-9 ISSN 0194-4088.
161. Azarpajouh*, S., J. Colpoys, J. Dekkers, N. Gabler, E. Huff-Lonergan, S. Lonergan, J. Patience, and **A. Johnson**. 2017. How has selection for residual feed intake (RFI) affected nursery and finishing pig's feeding behavior and performance? Pork Information Gateway: 12-21-2017. http://porkgateway.org/resource/selection-residual-feed-intake-rfi-affected-nursery-finisher-pigs-feeding-behavior-performance/

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51. McGlone, J. J. and **A. K. Johnson**. 2012. More is not always better. National Hog Farmer. Available at: http://www.nationalhogfarmer.com/animal-well-being/using-less-bedding-can-benefit-transit-market-pigs
50. **Johnson, A. K.** 2011. Dr. Johnson, Dr. J. McGlone (Texas Tech University) and Dr. T. Burkgren (American Association of Swine Veterinarians) were the leaders who spread their influence for on farm assessments and audits. www.animalauditor.org
49. **Johnson, A. K.** 2011. Clearing the last hurdle. PORK. Available at: http://www.porknetwork.com/pork-magazine/Clearing-the-Last-Hurdle--117258523.html
48. **Johnson, A. K**., and S. T. Millman. 2011. Lameness solutions could save $23 million. PORK. Available at: http://www.porknetwork.com/search/site/Lameness%20solutions%20could%20save%20%2423%20million
47. **Johnson, A**. K. 2011. Could it happen on your farm? Pork Checkoff Report. Volume 320(3). Page 13.
46. **Johnson, A. K.,** K. J. Stalder and L. A. Karriker. 2011. Pigs prefer drinkers opposite the feeder. National Hog Farmer. Swine Research Review. Available at http://nationalhogfarmer.com/animal-well-being/2011-swine-research-review-animal-welfare
45. Stalder K. J., **A. K. Johnson,** and L. A. Karriker. 2011. Impact of hoof abnormalities on sow behavior in farrowing. National Hog Farmer. Swine Research Review. Available at http://nationalhogfarmer.com/animal-well-being/2011-swine-research-review-animal-welfare
44. **Johnson, A. K.,** and K. J. Stalder. 2011. Pigs moved to large pens don't prefer "home" pen resources. National Hog Farmer. Swine Research Review. Available at http://nationalhogfarmer.com/animal-well-being/2011-swine-research-review-animal-welfare
43. Stalder, K. J., **A. K. Johnson,** S. Hoff, and L. A. Karriker. 2011. Static force plate enhances identification of lame sows. National Hog Farmer. Swine Research Review. Available at http://nationalhogfarmer.com/animal-well-being/2011-swine-research-review-animal-welfare
42. **Johnson, A. K.**, K. J. Stalder, L. Karriker, A. Roca*, W. Holt*, A. Johnson, and L. Layman*. 2011. Parity and feeding speed studied as group selection criteria. Swine Research Review: Available at http://nationalhogfarmer.com/animal-well-being/2011-swine-research-review-animal-welfare
41. Karriker, L. A., L. Layman*, A. O'Connor and **A. K. Johnson**. 2011. Review reveals variable studies on Porcine Respiratory Reproductive Syndrome vaccines. Swine Health Review. Available at http://nationalhogfarmer.com/animal-well-being/2011-swine-research-review-animal-welfare
40. **Johnson, A. K.** 2011. SelectCare. Iowa Select Farms welcomes Animal-Well-Being Committee. PorkPost. Iowa Select Farms. Volume 3(8). Pages 6 to 7.

NON-REFEREED EXTENSION PUBLICATIONS: ASSISTANT PROFESSOR 2005 TO P & T SUBMISSION OCTOBER 2010 (N = 39)

39. **Johnson, A. K.**, and S. Millman. 2010. People truly are the key to animal welfare efforts. College of Agriculture and Life Sciences. STORIES.
38. **Johnson, A. K.,** K. Stalder, and L. Karriker. 2010. Iowa State University researchers work to fix lameness issues in sows. Iowa State Daily. October 24th 2010 Available at http://www.iowastatedaily.com/news/article_d47b2e90-dcba-11df-a481-001cc4c002e0.html
37. Ritter, M. J., and **A. K. Johnson**. 2010. Hog Handling Report Issue 13. Effects of facility design on transport losses at the packing plant. Elanco Animal Health.

36. **Johnson, A. K.,** K. J. Stalder, and L. A. Karriker. 2010. Searching for clues to sow lameness. National Hog Farmer. Pages16-18.
35. **Johnson A. K.** 2010. Keep an eye on animal handling. PORK Magazine. Pages 18-19.
34. **Johnson, A. K.** 2009. Taking emotion out of animal welfare debate. Iowa Farm Bureau Spokesman.
33. Pajor E. A., and **A. K. Johnson**. 2009. How to evaluate animal comfortable? Available at http://www.usporkcenter.org/home/resources.aspx Accessed 6 January 2010.
32. Cressey N., Karriker, L., K. Stalder and **A. Johnson**. 2009. How to build a state-of-the-art swine research laboratory. Phi Zeta Gamma poster contest at Iowa State University College of Veterinary Medicine research day. August 1^{4th} 2009.
31. **Johnson, A. K.**, S. T. Millman, A. Zanella, and A. O'Connor. 2009 Across species, across disciplines and across borders: Opportunities for animal welfare and epidemiology scientists. Final report to Cooperative State Research, Education and Extension.
30. Karriker, L. A., S. Millman, K. J. Stalder and **A. K. Johnson**. 2009. Iowa State University opens house for sow lameness research. PigProgress.net
29. **Johnson, A. K.**, and R. F. Fitzgerald. 2009. Overall mouth health: How could this affect the sows productive lifetime? Farms.Com
28. Nikkilä, M*., K. Stalder, T. Serenius, B. Mote, M. Rothschild, **A. Johnson** and L. Karriker. 2009. Trait interactions offer clues to sow lifetime performance. National Hog Farmer. Pages 36 – 39.
27. Baker, R., **A. Johnson**, K. Stalder M Honeyman, and D. Busby. 2009. Finishing steers in a deep-bedded hoop barn and a conventional feedlot: effects on behavior and temperament in Iowa. Iowa State University, Armstrong and Neely-Kinyon Research and Demonstration Farms ISRF 08-12.
26. **Johnson, A. K**. 2009. Taking emotion out of animal welfare debate. Iowa Farm Bureau Federation.
25. Meiszberg, A. M*., **A. K. Johnson**, L. I. Engblom, K. J. Stalder, L. L. Layman, and L. A. Karriker. 2009. Parity 2 sows at risk for hoof over growth. National Hog Farmer: Swine Research Review. Page 33.
24. **Johnson, A. K**., L. Sadler, L. Gesing*, M. Faga, C. Feuerbach, H. Hill R. Bailey, and M. J. Ritter. 2009. Large pens, pre-sorting lessens stress, losses at the packing plant. National Hog Farmer: Swine Research Review. Page 40.
23. Sadler, L. J*., **A. K. Johnson**, S. M. Lonergan, D. Nettleton, and J. C. M. Dekkers. 2009. Gilt screening offers clues to greater feed efficiency. National Hog Farmer: Swine Research Review. Page 14.
22. **Johnson, A. K.** 2009. Are your pigs' road worthy? Pork Magazine. Pages 14-16.
21. Jackson, C*. L. A. Karriker, K. J. Stalder, and **A. K. Johnson**. 2009. New study sheds light on pig water consumption. Insight. A publication of Boehringer Ingelheim Vetmedica Inc., p 2.
20. Gesing, L*., **A. K. Johnson**, M. Faga, C. Feuerbach, H. Hill, R. Bailey, and M. Ritter. 2009. Pre-sorting market hogs may not pay off. Available at: http://nationalhogfarmer.com/behavior-welfare/1215-presorting-markets-not-payingoff/
19. Stalder, K., L. Karriker, and **A. Johnson**. 2008. Understanding sow mortality. Benchmarking: setting higher standards in pork production, 2007 Summary of the PigCHAMP Database. Farms.com Media and PigCHAMP, Volume 3(1). Pages 12 to 14.
18. Garvey, J. R*., **A. K. Johnson**, L. J. Sadler*, and J. J. McGlone. 2008. Piglet mortality in an outdoor farrowing hut: What behaviors contribute to their demise? National Hog Farmer March 2008. Page 29.
17. Meiszberg, A. M*., **A. K. Johnson**, J. W Dailey, J. A. Carroll, L. J. Sadler, J. Garvey* and N. Krebs. 2008. Water meter provides an accurate recording tool. National Hog Farmer. Pages 28 to 29.
16. Stalder, K., **A. Johnson**, and R. Fitzgerald. 2008. Preventing Dead on arrivals and fatigued pigs at harvest. PORK Magazine. Pages 24 to 25. Available at: http://www.porkmag.com/directories.asp?pgID=773&ed_id=6077
15. Berry, N. L*., and **A. K. Johnson**. 2008. New handling strategies. Farms.com. Benchmark Magazine. Volume 3. Pages 30 to 31.
14. Sadler, L. J., J. R. Garvey, T. J. Uhlenkamp, C. J. Jackson, K. Stalder, L. A. Karriker, R. A. Edler, J. T. Holck, P. Dubois, and **A. K. Johnson**. 2008. Report on drinker-to-nursery pigs' ratio. Available at

http://farms.com/FarmsPages/Commentary/DetailedCommentary/tabid/192/Default.aspx?NewsID=14973&CV=1

13. Stalder, K., **A. Johnson**, and L. Karriker. 2008. A new look at sow longevity. Gene Link, National Swine Registry, Pages 20-22.
12. **Johnson, A. K.** 2008. Well-Being of pigs at the top of her list. College of Agriculture and Life Sciences. STORIES. Page 8.
11. **Johnson, A. K.** 2007. How does the addition of gel at the time of vaccination affect overall nursery pig performance? Technical internal report for Land O Lakes distributed to their managers.
10. **Johnson, A. K.** 2007. Drinking behavior matters for vaccination success. PORK Magazine Page 38.
9. Edler, R., T. Holck, B. Lawrence, R. Baker*, and **A. Johnson**. 2007. Timing is critical with oral vaccination. National Hog Farmer. Page 33.
8. **Johnson, A. K.** 2007. National Geographic in campus to collect filming and footage for a documentary on the pig. Ames, IA. Program aired November 2007.
7. **Johnson, A. K.** 2007. Smithfield will stop its use of sow crates. Des Moines Register.
6. **Johnson, A. K.** 2007. Activists sue N.J. over farm animal rules. Des Moines Register.
5. **Johnson, A. K**. 2006. Welfare tells 'great story'. Feedstuffs.
4. **Johnson, A. K.,** S. E. Curtis, and J. Hill. 2006. Load out system developed at Premium Standard Farms addresses animal welfare. Meat quality. In: Perspective: Premium Standard Farms Newsletter.
3. **Johnson, A. K.**, R. G. Baker*, R. A. Edler, and J. T. Holck. 2006. You can lead a pig to water. National Hog Farmer. Page 4.
2. **Johnson, A. K.**, and Hill, J. D. 2006. "Chute down" pig stress. PORK article.
1. **Johnson, A. K.** 2006. No down time for animal behavior specialist. Iowa Farm Bureau. March 1st 2006.

CONFERENCE PROCEEDINGS: PROFESSOR (JULY 2018) TO SEVEN-YEAR REVIEW 2024 (N = 10)

45. Handa, D*., J. M. Peschel, **A. K. Johnson**, D. C. L. Linhares, C. J. Rademacher, B. Ramirez, and J. W. Ross. 2020. Overview of technologies to enable telemedicine in swine populations. Proceedings American Association of Swine Veterinarians 49th Annual Meeting, San Diego, California. Pp 5-6.
44. Peschel, J. M., **A. K. Johnson**, D. C. L. Linhares, C. J. Rademacher, and J. W. Ross. 2019. Automated visual sensemaking of livestock behavior. Proc 50th American Association of Swine Veterinarians Annual Meeting, Emerging Technologies Seminar. Lake Buena Vista, FL. March 9-12, 2019. pp 8-11.
43. Leonard, S.M*., H. Xin, T. Brown-Brandl, B. C. Ramirez, J. P. Stinn, and **A. K. Johnson**. 2019. Implication of modern sow's static and dynamic space usage on gestation stall design. Presented at International Symposium on Animal Environment and Welfare, Chongquing, China. Paper no. 31; Pp 1-6.
42. Garcia, A., **A. Johnson**, M. Calvo-Lorenzo, J. Ross, E. Akin, K. Stalder, J. McGlone, and S. Millman. 2019. Sick and injured (compromised) pigs on-farm. Pig Welfare Symposium, Minneapolis, Minnesota. p. 30.
41. Leonard, S., H. Xin, T. Brown-Brandl, B. C. Ramirez, J. P. Stinn, **A. Johnson**, and K. Liu. 2019. Characterization of a machine vision system to assess gestating sow space. Presented at American Society of Agricultural and Biological Engineers Annual International Meeting, Boston, Massachusetts. Paper no. 1900782.
40. **Johnson, A.** 2019. Incorporating animal welfare across the curriculum. Building capacity to ensure innovative solutions to emerging animal welfare challenges. May 15-16, 2019. Purdue University, West Lafayette, Indiana. https://www.purdue.edu/vet/CAWS/NIFA2019.php
39. Croney, C., **A. Johnson**, J. Swanson and N. Widmar. 2019. Overview of CAST Taskforce report on advancements and outstanding challenges in animal welfare: incorporating diverse approaches to better meet changing needs. May 15-16, 2019. Purdue University. West Lafayette, Indiana. https://www.purdue.edu/vet/CAWS/NIFA2019.php
38. Leonard, S*., H. Xin, T. M. Brown-Brandl, B. C. Ramirez, J. P. Stinn, **A. Johnson** and K. Liu. 2019. Characterization of a machine vision system to assess gestating sow space. Presented at American

Society of Agricultural and Biological Engineers Annual International Meeting 2019, Boston, Massachusetts. Paper no. 1900782.

37. **Johnson, A. K.** 2019. On-farm swine welfare: The basics. Ensminger Symposium. AHA Kopanong Hotel and conference centre, South Africa. Pp 22-31. www.ensmingersymposium.co.za
36. Chipman, A. L., C. J. Rademacher, C. D. Johnson, K. J. Stalder, **A. K. Johnson**, A. F. Keating, J. F. Patience, N. K. Gabler, D. Linhares, K. J. Schwartz, S. T. Millman, J. M. Studer, Z. E. Kiefer, G. Silva and J. W. Ross. 2018. Pelvic organ prolapse: An industry-wide collaboration to identify putative contributing factors. J. McKean Swine Disease Conference for swine practioners. Ames, Iowa. Pp 57-60.

CONFERENCE PROCEEDINGS: P & T REVIEW (OCTOBER 2010 TO JUNE 2011), ASSOCIATE PROFESSOR TO PROFESSOR SUBMISSION (N = 10)

35. Benjamin, M., and **A. K. Johnson.** 2018. Precision livestock farming for swine production, health and welfare. Proceedings American Association of Swine Veterinarians 49th Annual Meeting, San Diego, California. pp 5-6.
34. **Johnson, A. K.** J. W. Ross, S. Azarpajouh*, and S. T. Millman. 2016. Iowa Swine Welfare School: Tier One: On farm Euthanasia for Producers. Swine disease conference for swine practioners. Ames, Iowa. Pp 72-77.
33. Anthony, R., L. Bergamasco, J. Coetzee, R. Dzikamunhenga, S. Gould, **A. Johnson**, L. Karriker, J. Marchant-Forde, G. Martineau, J. McKean, S. Millman, S. Niekamp, A. O'Connor, E. Pajor, K. Rutherford, M. Sprague, M. Sutherland and E. Von Borell. 2014. Pain management in piglets during management procedures. A systematic review and GRADE process. 6th International Conference on the Assessment of Animal Welfare at Farm and Group Level, Clermont-Ferrand, France. Pp 62-63.
32. **Johnson, A. K.** 2014. The welfare of transportation. Proceedings American Association of Swine Veterinarians 45th Annual Meeting, Dallas Texas. Pp 591-596.
31. Sadler L*., L. Karriker, **A. Johnson**, C. Wang, T. Widowski and S. Millman. 2013. Effects of depression score on welfare implications of CO_2 and argon gas euthanasia of piglets. Proceedings of the 47th International Congress of the International Society of Applied Ethology, Florianopolis, Brazil. p 44.
30. **Johnson, A. K.,** and M. Pairis-Garcia*. 2013. Swine industry animal welfare issues and research programs in the USA. International symposium on animal environment and welfare. Edited by Richard Gates, Hongwei Xin Baoming Li and Ruqian Zhao. Pp 20-32. Ronchang Chongqing China.
29. **Johnson, A. K.** 2011. Evidence-based swine welfare: Where are we and where are we going? American Association Swine Veterinarians. 42nd Annual Meeting. Phoenix, Arizona Pp 403-407.
28. Stalder, K. J., L. A. Karriker and **A. K. Johnson.** 2011. Sow Management and Maximizing Longevity. Manitoba Swine Seminar, Manitoba, Canada. Available at: http://www.thepigsite.com/articles/2/breeding-and-reproduction/3463/sow-management-and-maximising-longevity
27. Stalder, K. J., C. E. Abell, L. A. Karriker, **A. K. Johnson** and S. Millman, 2011. Sow longevity: How to measure its importance. Swine Disease Conference for swine practioners. Ames, Iowa. Pp 132-135.
26. Pairis, M. D*., L. A. Karriker, K. J. Stalder, **A. K. Johnson**, and S. T. Millman. 2011. Detection of lameness in swine. Swine Disease Conference for swine practioners. Ames, Iowa. Pp 135-143.

CONFERENCE PROCEEDINGS: ASSISTANT PROFESSOR 2005 TO P & T SUBMISSION OCTOBER 2010 (N = 25)

25. Hensch, M*., L. L. Layman*, L. A. Karriker, J. Coetzee, and **A. K. Johnson**. 2010. Using serum cortisol to distinguish between acute stress and pain response following castration in piglets. Proceedings American Association Swine Veterinarians 41st Annual Meeting. Lincoln, Nebraska. Pp 37-39.
24. Gesing, L. M*., **A. K. Johnson**, K. J. Stalder, H. Hill, C. Feuerbach, A. Abrams, A. Whiley, M. Faga, R. Bailey and M. J. Ritter. 2010. Pre-sorting and pen size effects on the stress responses at loading and unloading and transport losses in market weight pigs. A. D. Leman conference. Minneapolis, Minnesota. Pp 106-111.

23. **Johnson, A. K.,** S. T. Millman, L. A. Karriker, K. J. Stalder and J. Coetzee. 2010. Second Inter-National Feet-First symposium held by Zinpro. Presented on Pain and lameness behavior in swine. Minneapolis, Minnesota. Pp 36-45.
22. Ritter, M. J., and **A. K. Johnson**. 2009. Facility design and transport: the welfare connection. Livestock Transport conference. Calgary, Canada. p 541.
21. Elmore, M. R. P*., **A. K. Johnson,** J. P. Garner, B. T. Richert, and E. A. Pajor. 2009. Sow social status alters enrichment use, but not motivation for a group pen. International Society for Applied Ethology. Proceedings of the 9th International Society of Applied Ethology North-American Regional Meeting. McGill University, Québec, Canada. p 31.
20. **Johnson, A. K.,** L. A. Karriker, and K. J. Stalder. 2009. How are behavioral measures being used to assess swine well-being during research and commercial practice? The 50th Annual George A. Young Swine health and management conference. Omaha, Nebraska. Pp 34-47.
19. Karriker, L. A., J. Bowden*, and **A. K. Johnson.** 2009. A systematic review of the evidence for porcine reproductive and respiratory syndrome virus vaccine efficacy in reproductive disease. The 50th Annual George A. Young Swine health and management conference. Omaha, Nebraska. Pp 1-4.
18. Pairis, M*., J. Garvey*, A. Young, **A. Johnson** and S. Millman. 2009. Can fear be effectively assessed in swine? American Association of Swine Veterinarians. 40th Annual Meeting, Dallas, Texas. p 331.
17. Ritter, M. J., M. Ellis, and **A. K. Johnson**. 2009. Transporting more dollars to the bank. American Association of Swine Veterinarians. 40th Annual Meeting, Dallas, Texas. Pp 533-535.
16. Karriker L, K. Stalder K, **A. Johnson**, and L. Layman*. 2008. Session 5536. Lesions compromising sow longevity. Conference Notes CD of the 145th American Veterinary Medical Association Meeting. New Orleans, Louisiana.
15. Karriker L, **A. Johnson**, K. Stalder, and N. Berry*. 2008. Session 5537. Manipulating transport for improved well-being. Conference Notes CD of the 145th American Veterinary Medical Association Meeting. Louisiana, USA.
14. Pittman, M. R*., **A. K. Johnson**, J. P. Garner, R. D. Kirkden, B. T. Richert, and E. A. Pajor. 2008. The motivation of gestating sows for an enriched group pen and their behavior after 24 hours of deprivation. Proceedings of the 42nd Congress of the International Society of Applied Ethology. Addressing future challenges in animal agriculture. Dublin, Ireland. p 191.
13. Stalder, K. J., **A. K. Johnson**, and L. A. Karriker. 2008. Understanding sow longevity and mortality. American Association of Swine Veterinarians. 39th Annual Meeting, San Diego, California. Pp 531-538.
12. Stalder, K. J., L. A. Karriker, **A. K. Johnson**, M. F. Rothschild, and T. Serenius. 2008. Sow Longevity: Genetic and phenotypic selection considerations. American Association of Swine Veterinarians. 39th Annual Meeting, San Diego, California. Pp 33-39.
11. **Johnson, A. K**. Setting the farm animal welfare scene in North America. **Keynote Speaker** 8th International Livestock Environmental Symposium. Iguassu Falls, Brazil. pp 494-503.
10. Stalder, K., L. Karriker, and **A. Johnson**. 2008. Understanding sow mortality. Benchmarking: Setting Higher Standards in Pork Production, Summary of the PigCHAMP Database. Farms.com Media and PigCHAMP. Ames, Iowa. 3:12-14.
9. Bowden, J. M*., **A. K. Johnson**, K. J. Stalder, and L. A. Karriker. 2008. Behavioral Validation for Nursery Pigs. American Association of Swine Veterinarians. 39th Annual Meeting, San Diego, California. Pp 327-328.
8. Edler, R. A., J. T. Holck, L. J. Sadler*, J. R. Garvey*, T. J. Uhlenkamp, C. J. Jackson*, K. J. Stalder, L. A. Karriker, and **A. K. Johnson**. 2008. Drinker to Nursery Pigs ratio: Effects on Drinking Behavior and Performance. Proceedings of the first North American welfare and epidemiology conference: Across species, across disciplines and across borders. Ames, Iowa. p 31.
7. Fitzgerald, R*., K. Stalder, N. Matthews, C. Schultz-Kaster, and **A. Johnson**. 2008. Effect of environmental factors on the frequency of fatigued pigs and mortality rates at a commercial abattoir. 8th International Livestock Environment Symposium. Rio de Janeiro, Brazil. pp 574-582.

6. Berry, N*., **A. Johnson**, J. Hill, T. Baas, L. Karriker and K. Stalder. 2007. Loading gantry versus traditional chute for the finisher pig: Effect on welfare parameters at time of marketing. 60th Annual Reciprocal Meat Conference. South Dakota. Pp 45-48.
5. Edler, R. A., J. Tyler, Holck, B. V. Lawrence, R. G. Baker*, and **A. K. Johnson**. 2007. Drinking behavior of nursery pigs for oral vaccine administration. Proceedings 3rd Congress of the Asian Pig Veterinary Society. Wuhan, China.
4. Berry, N*., **A. Johnson**, J. Hill, T. Baas, L. Karriker and K. Stalder. 2007. Loading gantry versus traditional chute for the finisher pig: Effect on welfare parameters at time of marketing. Allen D. Leman Swine Conference. Minneapolis, Minnesota. p 137.
3. Sadler, L*., J. Garvey*, T. Uhlenkamp*, R. Edler, T. Holck, P. DuBois, and **A. Johnson**. 2007. Drinker to nursery pig ratio: Effects on drinking behavior and performance. Allen D. Leman Swine Conference. Minneapolis, Minnesota. p 49.
2. Hill, J. N. Berry* and **A. K. Johnson**. 2006. Handling and load out: The complex interaction between the pig, caretaker and the facility. Pork Academy, National Pork Board, Clive Iowa.
1. Edler, R. A., J. T. Holck, B. V. Lawrence, R. G. Baker*, and **A. K. Johnson**. 2006. Drinking behavior or nursery pigs for oral vaccine administration. Allen D. Leman Swine Conference. Minneapolis, Minnesota. p 38.

*****Prior to appointment at ISU available upon request (n = 10)*****

INVITED TALKS: PROFESSOR TO SEVEN-YEAR REVIEW 2024 (N = 3)

INTERNATIONAL (N = 5; Butters-Johnson presented 3)

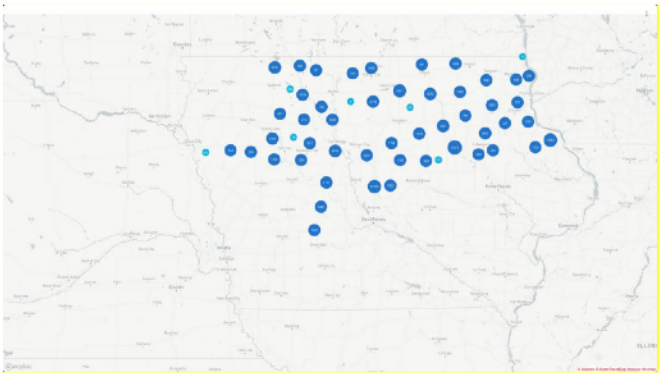
5. Sundman, E., N. K. Gabler, S. T. Millman, K. J. Stalder, L. A. Karriker and **A. K. Johnson.** 2021. The use of attractants to stimulate neonatal piglet interest in rope enrichment. International conference in pig survivability. Omaha, Nebraska, USA. Total of 451 persons attended this two-day event, with 29 U.S. states represented, 5 Countries and 175 companies.
4. Sundman, E., N. K. Gabler, S. T. Millman, K. J. Stalder, L. A. Karriker and **A. K. Johnson.** 2021. Nutritional enrichment to improve the weaning transition of nursery aged swine. International conference in pig survivability. Omaha, Nebraska, USA. Total of 451 persons attended this two-day event, with 29 U.S. states represented, 5 Countries and 175 companies.
3. **Johnson, A. K.** S. T. Millman, K. Proudfoot and L. Améndola. 2021. Workshop: Animal welfare in veterinary education. Presented at the 8th International conference on the assessment of animal welfare at the farm and group level. https://www.wafl2021.com/ Learning outcomes were as follows: (1) Identify the features of a case study using the "good case study checklist" (2) Identify different levels of case complexity, (3) Describe at least 3 different methods for teaching with case studies. Using an existing case study, you will be able to: (1) Improve the case quality using the "good case study checklist" (2) Adapt the case to a desired level of complexity and, (3) Plan a teaching strategy for the case, using one of the methods presented in the workshop. A total of 20 participants joined. ***Countries attended***: Argentina, Australia, Canada, Chile, Finland, Germany, India, Ireland, Italy, Japan, Norway, UK, and, USA.
2. **Johnson, A. K.,** R. Main and J. Kolbes. 2021. Precision Livestock Farming in Hog Production. Precision Livestock Farming (PLF) technologies will transform the swine industry forever. Understanding what tools exists today and what's in development will better position stakeholders to discover new heights in production and animal health and well-being. Join us for this unique webinar - filmed in-person - as we discuss this exciting topic in hog production. Science talks webinar series. Sponsor Merck. https://www.nationalhogfarmer.com/webinars/webinar-precision-livestock-farming-hog-production
Countries attended: Argentina – 3, Australia – 4, Brazil – 4, Canada – 2, Chile – 3, Germany – 1, India – 1, Israel – 1, Lesotho – 1, Mexico – 8, Nigeria – 1, Peru – 1, Philippines – 5, Russia – 1, Slovakia – 1, Taiwan – 2, Thailand – 2, Turkey – 1, United Kingdom – 1, Uruguay – 1, Vietnam – 3.

Demographics: 30% veterinarians, 30% allied industries, 17% government, 18% pig producers. 2% academic and 3% others.

1. **Johnson, A. K.** 2019. On farm animal behavior and welfare. Advances in Animal Production. Ensminger Symposium. AHA Kopanong Hotel, Johannesburg, South Africa. www.ensmingersymposium.co.za

NATIONAL (N = 4; Butters-Johnson presented 3)

4. Sundman, E. S., N. G. Gabler, S. T. Millman, K. J. Stalder, L. A. Karriker, and **A. K. Johnson**. 2021. Nutritional enrichment to improve the welfare of nursery-aged swine at weaning. Presented at Advancing Animal Welfare together symposium. Sponsored by Merck Animal Health. Monday November 15th to Wednesday 17th November 2021, Orlando, FL. Abstract was selected by Dr. A. Baysinger Animal Welfare lead, North America for presentation.
3. **Johnson, A. K.** and M. J. Ritter. 2021. Swine Extension Podcast. PigX Season 2: Episode 3 is live. Dr. Matt Ritter, Cargill Director of Technical Services, and Dr. Anna Johnson, Professor of Animal Behavior and Welfare at Iowa State University, join the PigX podcast to talk about transport losses. From animal are to employee management, there are multiple parts and pieces to animal losses during the transportation process. https://globalagnetwork.com/pigx/podcast/season-2-ep-3-transport-losses
2. **Johnson, A. K.** 2021. Animal care requires a team approach. Iowa Pork Producers Association. https://www.iowapork.org/choptalk/ Total downloads of the podcast edition 976. U.S. and primarily Iowa residents living in and around communities of <20,000 people. ChopTalk Podcast *Objective*: Develop podcast series that reinforces key reinforces key messages among our two primary target audiences (1) Iowa residents living in and around communities of <20,000 people and (2) Primary Iowa county and city influencers/leaders of these communities. *Description*: Iowa leads the nation in pig production, but many Iowan's still have questions about their care. Laurie Johns talks about animal care with a livestock trucker and ISU expert. *Posted on*: Apple, Spreaker, iHeartRadio, Google, Castbox, Deezer, Podcast Addict, Podchaser and JioSaavn. *Metrics* (April 5 – May 31, 2021): Downloads 925, Trade media display advertising 174,371, impressions 351 clicks, programmatic display adverting 1,667,237, impressions 6,858. Map of "hits:



1. **Johnson, A. K.,** M. Faga and L. Jones. 2019. Vunerable Pig Management; Management of the venerable pig before and during transport. Pig Welfare Symposium. Minneapolis St Paul, Minnesota.

REGIONAL (N = 1; Butters-Johnson presented 1)

1. Johnson, A. K. 2020. Environmental enrichment for poultry and swine practioners. Iowa Veterinary Medical Association. Altoona, Iowa.

INVITED TALKS: P & T REVIEW (OCTOBER 2010 TO JUNE 2011), ASSOCIATE PROFESSOR TO FULL PROFESSOR SUBMISSION (N = 49)

REGIONAL (N = 28; Butters-Johnson presented 20)

29. **Johnson, A. K.** 2018. Proactive on-farm swine welfare" Tools, strategies and empowerment for the industry to succeed. Iowa swine Day. Ames, Iowa.

28. **Johnson, A. K.** 2017. U.S. Soybean Export Council: Sustainability Media Tour. Countries represented were Belgium, Germany, Hungary, Ireland, Netherlands, Poland and the United Kingdom. Spoke to them about on-farm swine welfare in the United States. Ames, Iowa.
27. **Johnson, A. K.** 2017. Iowa Veterinary Medical Association winter meeting. Common Swine Industry Audit: What do veterinarians need to know? Prairie Meadows Events Center, Altoona, Iowa.
26. **Johnson, A. K**. 2016. Animal welfare extension program update. Department of Animal Science external advisory committee, Ames, Iowa.
25. **Johnson, A. K.** 2016. What is "animal welfare?" Johnsonville. Ames, IA. Ames, Iowa.
24. **Johnson, A. K.** 2015. Swine handling. Smithfield Meat and Poultry Training Program. Ames, Iowa.
23. **Johnson, A. K.** 2015. Farm animal welfare in the USA. Ukraine Pork Producers. Ames, Iowa.
22. **Johnson, A. K.** 2015. How has the Iowa Farm Bureau Federation Animal Well-Being Post-Doctoral money been wisely spent? Department of Animal Science external advisory committee. Ames, Iowa.
21. **Johnson, A. K.** 2015. Swine handling. Smithfield Meat and Poultry Training Program. Ames, Iowa.
20. **Johnson, A. K.** 2015. Animal Handling. Smithfield Foods Meat and Poultry Brown Belt Training. Ames, Iowa.
19. **Johnson, A. K.** 2015. Common Swine Industry Audit Tool. Land O Lakes' pig sourcing team. Ames, Iowa.
18. Colpoys, J*., **A. Johnson** and N. Gabler. 2015. Behavioral response in pigs selected for low or high residual feed intake. Agriculture Food Research Initiative Advisory Board Meeting. Ames, Iowa.
17. **Johnson, A. K.** 2015. Animal Handling. Smithfield Foods Black Belt Training. Ames, Iowa.
16. **Johnson, A. K.,** and M. D. Pairis-Garcia. P.O.R.K. symposium on pain management for lame sows. World Pork Expo, Des Moines, Iowa.
15. **Johnson, A. K.** 2014. Farm animal welfare in the U.S.A.: Challenges ahead. Danish Agricultural Minister. Ames, Iowa.
14. Pairis-Garcia, M*., S. Millman, J. Coetzee, L. Karriker, B. Kukanich, L. Wulf, S. Sanders, K. Stalder and **A. Johnson**. 2014. Pharmacokinetics and efficacy of flunixin meglumine in lame sows using pressure algometry. College of Veterinary Medicine Research Day, Iowa State University, Ames, Iowa.
13. **Johnson, A. K.** 2014. Dealing with allegations of cruelty on a swine facility. Iowa Veterinary Medical Association. Ames, Iowa.
12. Sadler L.J*., L. A. Karriker, K. J. Schwartz, **A. K. Johnson**, T. M. Widowski, C. Wang, M. A. Sutherland, and S. T. Millman. 2014. Are severely depressed neonatal pigs resistant to gas euthanasia? College of Veterinary Medicine Faculty Research Day, Iowa State University, Ames, Iowa.
11. Millman S, **A. Johnson**, L. Karriker, J. Shearer, G. Dewell, R. Dewell, H. Xin, A. O'Connor, M. Sutherland, J. Coetzee, R. Anthony, C. Hagen, C. Rademacher and S. Niekamp S, 2013. An examination of argon gas for on-farm anesthesia and euthanasia of livestock. College of Veterinary Medicine Faculty Research Day, Iowa State University, Ames, Iowa.
10. Mohling, C*., **A. Johnson**, K. Stalder, L. Karriker, J. Coetzee, and S. Millman. 2013. Use of thermal and pressure nociception as objective tools to measure painful and non-painful lameness states in multiparous sows. College of Veterinary Medicine Faculty Research Day, Iowa State University, Ames, Iowa.
9. Steffens, K., **A. K. Johnson**, and S. T. Millman. 2013. Differences in food animal industry communication regarding animal welfare. Honors Poster Presentation, Iowa State University, Ames, Iowa.
8. **Johnson, A. K**. 2013. Improving livestock herd management techniques for swine producers in Vietnam. Ames, Iowa.
7. Sholar J. F*., J. D. Colpoys*, N. K. Gabler, A. F. Keating, S. T. Millman, J. M. Siegford, and **A. K. Johnson**. 2013. Gilt approachability to a human when selecting for feed efficiency. Poster presented at the Science with Practice Poster Presentation, Iowa State University, Ames, Iowa. ***Certificate of excellence placement.***
6. **Johnson, A.K.** 2012. The 101 of swine welfare: what should I know? Iowa Swine Day. Ames, Iowa.

5. **Johnson, A. K.** 2012. What does a well-managed group system look like: Lameness and injuries among gestating sows. Gestation sow housing webinar. Federation of Animal Science Society and the American Veterinary Medical Association. Ames, Iowa.
4. **Johnson, A. K.** 2011. Farm animal welfare in North America. January 9th 2011. Hearth and Heather social club organized by Professor P. Lasley.
3. **Johnson, A. K.**, and S. Millman. 2011. Hen welfare. Information session with Iowa Legislators on Egg Production. Henry Wallace Building, Des Moines, IA. January 31st 2011.
2. **Johnson, A. K.** 2011. Iowa Swine Welfare School; Euthanasia training module. Instructor for the course. Saturday 9th April 2011. CVM, Ames, IA.
1. **Johnson, A. K.** 2011. Alternative Farrowing. Sow Bridge. Wednesday 7th September 2011.

NATIONAL (N = 15; Butters-Johnson presented 12)

16. **Johnson, A. K.** 2017. Invited by Mr. B. Peyer Animal Welfare Director Johnsonville Sausage. One of four speakers. Addressed 250 Johnsonville employees ranging from plants, marketing, legal and upper management. Title of talk "what does welfare mean to the producer?" Sheboygan Falls, Wisconsin.
15. **Johnson, A. K.** 2016. Meeting with Smithfield One Production Specialist (n=64) to give them an overview of the Common Swine Industry Audit tool. Rosehill, North Carolina.
14. **Johnson, A. K.** 2015. Swine Care Handbook Revision meeting. Chicago, Illinois.
13. **Johnson. A. K.** 2015. What is Animal Welfare? Oscar Myer, Madison Wisconsin.
12. **Johnson, A.** 2015. Impact of selection for feed efficiency on susceptibility to behavioral stress. Plenary session of the International Conference on Feed Efficiency in Swine. Omaha, NE.
11. **Johnson, A.** 2015. Presented on Impact of selection for feed efficiency on susceptibility to behavioral stress. Breakout session: 5. Session of the International Conference on Feed Efficiency in Swine. Thursday 22 October 2015. Omaha, Nebraska.
10. Parsons R. L*., **A. K. Johnson**, L. J. Sadler* and S. T. Millman. 2014. Iowa Swine Welfare School: An integrated euthanasia training module for swine producers. American Veterinary Medical Association. Humane Ending Symposium, Fairmont, Illinois.
9. Millman S. T., I. Withrock*, P. Plummer, **A. Johnson** and H. Xin. 2014. Responses of neonatal goats (kids) to different concentrations of carbon dioxide gas. American Veterinary Medical Association. Humane Ending Symposium, Fairmont, Illinois.
8. **Johnson, A. K**. 2013. How the U.S. Swine industry remains sustainable with an increasing focus on welfare? Pork Value Chain Executive Forum. Panel member. Hosted by Zoetis, Miami, Florida.
7. Sadler L*. J., L. A. Karriker, K. J. Schwartz, **A. K. Johnson**, T. M. Widowski, C. Wang, M. A. Sutherland, and S. T. Millman. 2013. Are severely depressed neonatal pigs resistant to gas euthanasia? 2013 Animal Health and Animal Well-being Project Director Workshop, College Park, Maryland.
6. **Johnson A. K**. 2012. Working to foster the discovery, sharing and application of knowledge concerning the well-being of farm animals. **Animal Science Early Career achievement award,** Phoenix Arizona.
5. **Johnson, A. K**. 2012. Tailoring research to a specific audience. Reacting to Media Enquiries. Graduate Student Lunch and Learn. American Society of Animal Science, Phoenix Arizona.
4. **Johnson, A. K.** 2011. Evidence-based swine welfare: Where are we and where are we going? American Association of Swine Veterinarians. Monday 7th March 2011. Phoenix, Arizona. Available at: https://www.aasv.org/news/story.php?id=5047
3. **Johnson, A. K.** 2011. What is animal rights and animal welfare? Nebraska and Iowa Extension Animal Welfare Professional Development. Harrah's Casino and convention, Council Bluffs, Nebraska.
2. **Johnson, A. K.** 2011. The Five Freedoms? Nebraska and Iowa Extension Animal Welfare Professional Development Harrah's Casino and convention, Council Bluffs, Nebraska.
1. Tapper, K*., **A. Johnson**, L. Karriker, K. Stalder, J. Coetzee, R. Parsons*, and S. Millman. 2011. Non-steroidal anti-inflammatory drugs to mitigate pain in lame sows. 45th International Congress of the International Society of Applied Ethology, Indianapolis, Indiana.

INTERNATIONAL (N = 5; Butters-Johnson presented 2)

5. Tapper, K. R., **A. K. Johnson**., A. O'Connor, and S. T. Millman. 2015. An animal welfare assessment of swine marketed through buying stations in the United States. Human Slaughter Association International Symposium 2015: Recent advances II. Zagreb, Croatia.
4. Luna, K. C., **A. K. Johnson**, L. A. Karriker, T. A. Shepherd, J. P. Stinn, H. Xin, M. A. Sutherland, D. C. Lay. And S. T. Millman. 2015. Assessment of aversion to different concentrations of CO_2 gas by weaned pigs using an approach-avoidance paradigm. Human Slaughter Association International Symposium 2015: Recent advances II. Zagreb, Croatia.
3. McGlone, J. J., and **A. K. Johnson**. 2014. Opportunities to Improve Transport Losses: Efficacy of Trailer Bedding and Boarding Levels. International Pig Veterinary Congress. Cancun, Mexico.
2. **Johnson, A. K.** 2014. On farm animal behavior and welfare. Advances in Animal Production. Ensminger Symposium. La Molina, Lima, Peru.
1. **Johnson, A. K.** 2013. International symposium on animal environment and welfare. Wednesday 16th to Wednesday 23rd October 2013, Ronchang, Chongqing, China.

INVITED TALKS: ASSISTANT PROFESSOR 2005 TO P & T SUBMISSION OCTOBER 2010 (N = 81)

REGIONAL (N = 56; Butters-Johnson presented 35)

81. Sadler, L*. J., **A. K. Johnson**, S. M. Lonergan, D. Nettleton, and J. C. M. Dekkers. 2010. The effect of selection for residual feed intake on general behavioral activity in Yorkshire gilts. Iowa Nutritional Feed Seminar. Memorial Union, Iowa State University, Ames, Iowa.
80. Gesing, L*. M., **A. K. Johnson**, K. J. Stalder, M. Faga, C. Feuerbach, H. Hill, R. Bailey, and M. J. Ritter. 2010. Effects of pre-sorting on the stress response of market weight pigs during loading and unloading. Iowa Nutritional Feed Seminar. Memorial Union, Iowa State University, Ames, Iowa.
79. Abell, C. E., G. F. Jones, L. A. Karriker, **A. K. Johnson**, and K. J. Stalder. 2010. Determining optimal maximum culling parity in commercial swine breeding herds. Iowa Nutritional Feed Seminar. Memorial Union, Iowa State University, Ames, Iowa.
78. **Johnson, A. K**. 2009. National Pork Board Forum: Swine handling and transport. Effects of facility design on the stress response of the market weight pig at the farm during loading and unloading. Des Moines, Iowa.
77. Ritter, M. J., M. Ellis, and **A. K. Johnson**. 2009. National Pork Board Forum: Swine handling and transport. The costs of transport losses. Des Moines, Iowa.
76. Berry, N*., J. Hill, L. A. Karriker, K. J. Stalder, and **A. K. Johnson**. 2009. National Pork Board Forum: Swine handling and transport. Loading ramp design. Des Moines, Iowa.
75. **Johnson, A.** 2009. Public attitudes about animal care; animal welfare, animal protection and animal rights. Iowa Veterinary Medical Association Ames, Iowa.
74. Baker, R*., **A. Johnson**, M. Honeyman, L. Sadler, K. Stalder, and M. Honeyman. 2009. The effect of facilities on steer behavior and temperament during the winter. Ames, IA. Presented by R. Baker at the Iowa Nutritional Feed Seminar, Ames, Iowa.
73. Dickey, E*. K. Bregendahl, and **A. Johnson**. 2009. Evaluation of a pre-molt calcium and low-energy molting program: effects on behavior. Ames, IA. Presented by A. K. Johnson at the Iowa Nutritional Feed Seminar.
72. Garvey, J*., J. J. McGlone, L. J. Sadler*, and **A. K. Johnson**. 2009. Piglet mortality in an outdoor farrowing hut: What behaviors contribute to their demise over the first 72-h? Ames, IA. Presented by L. J. Sadler at the Iowa Nutritional Feed Seminar, Ames, Iowa.
71. Kline, J*., **A. Johnson**, R. Witte*, L. Sadler*, B. De Rodas, D. Brown, L. Layman*, W. Holt*, L. Karriker, and K. Stalder. 2008. The effect of supplementing dry feed with a nutritional gel additive at the time of vaccination on nursery pig behavior. Ames, IA. Presented by J. Kline at the Iowa Nutritional Feed Seminar, Ames, Iowa.
70. Jackson, C*., K. Stalder, L. Sadler, R. Edler, J. Holck, P. DuBois, L. Karriker, and **A. Johnson**. 2009. Drinker to nursery pig ratio: effects on behavior. Ames, IA. Presented by a. A. K. Johnson at the Iowa Nutritional Feed Seminar.

69. **Johnson, A. K**., L. J. Sadler*, K. J. Stalder, and W. Powers. 2009. Influence of corn products on the behavioral repertoire of growing-finishing pigs. Ames, IA. Presented by A. K. Johnson at the Iowa Nutritional Feed Seminar, Ames, Iowa.
68. Nikkilä, M*., K. Stalder, B. Mote, J. Lampe, B. Thorn, M. Rothschild, **A. Johnson**, L. Karriker, and T. Serenius. 2009. Impact of gilts' body composition and body structure on reproductive performance. Ames, IA. Presented by M. Nikkilä at the Iowa Nutritional Feed Seminar, Ames, Iowa.
67. Nikkilä, M*., K. Stalder, B. Mote, J. Lampe, B. Thorn, M. Rothschild, **A. Johnson**, L. Karriker, and T. Serenius. 2009. Association between body and leg structure traits in gilts. Ames, IA. Presented by M. Nikkilä at the Iowa Nutritional Feed Seminar, Ames, Iowa.
66. Holt, W*., J. Reiman, **A. Johnson**, J. Hanson, L. Layman*, and L. Karriker. 2009. Impact of time and temperature on diagnostic outcome in swine. Ames, IA. Presented by W. J. Holt at the Iowa Nutritional Feed Seminar, Ames, Iowa.
65. **Johnson, A. K.** 2009. Spencer, Iowa Golf and Country Club personally invited by the Agriculture Committee of the Chamber of Commerce. Farm animal behavior and animal well-being research and wrote an article for the Spencer newsletter that circulates to 350 readers titled "Farm animal welfare."
64. **Johnson, A. K**. K. J. Stalder and L. A. Karriker. 2009. American Association of Swine Veterinarians Summer workshop; Identifying and managing the pain associated with lameness. Ames, IA.
63. **Johnson A. K.** 2009. Castration impacts, controversies and solutions. Swine Disease Conference for swine practitioners. Ames, Iowa.
62. **Johnson, A. K.,** C. J. Jackson. 2008. Drinking behavior of the seven-week-old nursery pig when eater is either withheld or provided ad-libitum. Iowa Feed and Nutrition Seminar. Ames, Iowa.
61. Baker, R*., **A. Johnson**, S. Lonergan, M. Honeyman and K. Stalder. 2008. Beef cattle raised in a bedded Hoop barn vs. a Conventional Feedlot: How does it affect behavior and temperament over the summer? Iowa Feed and Nutrition Seminar. Ames, Iowa.
60. Donahue, E*. **A. Johnson**, G Brant, C. Stahl and K. Bregendahl. 2008. Evaluation of a fine-limestone low-energy molt program for laying hens. Presented at Iowa Feed and Nutrition Seminar Ames, Iowa.
59. Layman, L*., **A. Johnson**, L. Karriker, W. Holt*, K. Stalder and B. De Rodas. 2008. **Invited**. Impact of gel-based feed supplement on growth response in nursery pigs at the time of vaccination. Presented at Iowa Feed and Nutrition Seminar Ames, Iowa.
58. Fitzgerald, R*. K. J. Stalder, J. O. Matthews, C. M. Schultz-Kaster, and **A. K. Johnson**. 2008. Factors that increase the frequency of stressed cripple and dead pigs at a commercial abattoir. Presented at Iowa Feed and Nutrition Seminar Ames, Iowa.
57. Nikkilä, M*., K. Stalder, B. Mote, J. Lampe, B. Thorn, M. Rothschild, **A. Johnson**, L. Karriker, and T. Serenius. 2008. Genetic correlations between body composition and structural soundness traits in crossbred gilts. Presented at Iowa Feed and Nutrition Seminar Ames, Iowa.
56. **Johnson, A. K.** 2008. Understanding swine behavior in production settings. American Association of Swine Veterinarians. Summer conference. Ames, Iowa.
55. **Johnson, A. K.** 2008. Boehringer Ingelheim Vetmedica swine Academy Guest Lecturer. Understanding swine drinking behavior in production settings: How can this help with oral vaccines? Ames, Iowa.
54. **Johnson**, **A.** 2008. Setting the scene on animal welfare in North America. Industry Feed and Nutrition Seminar Ames, Iowa.
53. **Johnson**, **A.** 2008. Free access gestation sow systems from Denmark, 2008. Iowa Pork Producer Association Des Moines, Iowa.
52. **Johnson, A. K.** 2008. Video for the National Pork Board; Swine Welfare Assurance Program: Where has the industry been? Video to be used in all Pork Quality Assurance Plus training sessions for the advisors. Des Moines, Iowa.
51. **Johnson, A. K.** 2008. Video recording for use by the National Pork Board's marketing division (Teresa Roof [Manager Public relations and Traci Rodemeyer [Demand and Enhancement]] on answers to activist claims again animal care and husbandry in the U.S. pork industry. Des Moines, IA.
50. **Johnson, A. K.** 2008. Pigs are hungry too http://www.youtube.com/watch?v=Ir6v49miz_Q
49. **Johnson, A. K.** 2008. Pig Farmers Take Action http://www.youtube.com/watch?v=VesGjjdHEsk

48. **Johnson, A. K.** 2008. Ride along with a pig http://www.youtube.com/watch?v=9Y7LiKlDZXw.
47. **Johnson, A. K.** 2008. Agriculture and life sciences. Available at http://www.ag.iastate.edu/research/videos/?id=4
46. **Johnson, A. K.** 2007. Animal welfare, animal rights and the egg industry. Iowa Egg Industry conference proceedings, Ames, Iowa.
45. Stalder, K. J., **A. K. Johnson**, L. Karriker and J. McKean. 2007. Gestation sow housing and its implications on health. Sow Housing Forum. Des Moines, Iowa. Presented at the Marriott Hotel.
44. Stalder, K. J., L. V. Karriker, **A. K. Johnson** and F. C. Gunsett. 2007. The impact of gestation housing systems on sow longevity. Sow Housing Forum. June 6th 2007. Presented at the Marriott Hotel. Des Moines, Iowa.
43. **Johnson, A. K.** 2007. Interaction of the sow and piglet during lactation. Presentations given at the "birth to weaning" meeting sponsored by Tech Mix. Des Moines, Iowa.
42. **Johnson, A. K.** 2007. Gestation housing: Beyond individual sow spaces. Presentation given at Civic Center, Waverley Iowa.
41. **Johnson, A. K.** 2007. Swine Nursery Drinking Behavior Research. Presented at Iowa Feed and Nutrition Seminar. Ames, Iowa.
40. **Johnson, A. K.** 2007. Hosted the Japanese Ministry of Agriculture Fisheries and Food and National Pork Producers Council from Washington D.C. Spoke about the swine well-being research initiatives, teaching and extension activities as well. Students: Berry, Fitzgerald and Goldsmith presented, in addition Dr. K. Stalder presented the sow productive lifetime posters and the extension related activities. Ames, Iowa.
39. **Johnson, A. K.** 2007. How can we design the farming environments using animals' behavior to meet the five freedoms? Iowa Branch American Association for Laboratory Animal Sciences Annual Fall Meeting. Ames, Iowa.
38. **Johnson, A. K.** 2007. Animal welfare, animal rights and the egg industry. Iowa Egg Industry, Ames Iowa.
37. **Johnson, A. K.** 2007. Board of Directors on the use of startup funding provided by the Leopold Centre, Ames, Iowa.
36. **Johnson, A. K.** 2007. Pork Forum: Continuing education on gestation sow housing options. Des Moines, Iowa
35. **Johnson, A. K**. 2006. Preparation for a welfare assessment. Professional Mangers Conference, National Pork Board. Des Moines, Iowa.
34. **Johnson, A. K.** 2006. Perspectives on Animal Welfare. Educational Seminars for the Iowa Pork Producers Association annual meeting Des Moines, Iowa.
33. **Johnson, A. K.** 2006. Animal welfare: Codes, Assessments and the Law. Presented at the Northeast Iowa Swine Extension meeting, Oelwein, Iowa.
32. **Johnson, A. K.** 2006. Animal welfare impact on reproductive performance. Advanced swine reproductive management seminar. Sheldon, Iowa.
31. **Johnson, A. K.** 2006. Animal Welfare: Swine Welfare Assurance Program™. 4-H Story County Extension Office, Nevada, IA.
30. **Johnson, A. K.** 2006. Iowa Pork Producers Association Youth 101. Animal Welfare and Swine Welfare Assurance Program Assessments. College of Veterinary Medicine, Iowa State University, Ames, Iowa.
29. **Johnson, A. K**. 2006. Iowa Feed and Nutrition Seminar. Animal behavior and welfare research at Iowa State University. Current projects and future planning.
28. **Johnson, A. K.** 2006. Boehringer Ingelheim Vetmedica Inc. Drinking behavior of pigs: Past studies and future thoughts. Ames, Iowa.
27. Hill, J. N. Berry* and **A. K. Johnson**. 2006. Handling and load out: The complex interaction between the pig, caretaker and the facility. Pork Academy, National Pork Board. Des Moines, IA.
26. **Johnson, A. K.** 2006. Swine well-being: Current and future challenges: How is the industry responding? Think Tank. Iowa State University. Campus, Ames, Iowa.

NATIONAL (N = 19; Butters-Johnson presented 9)

25. **Johnson, A. K**. 2010. Effects of facility design on the welfare of market weight pigs. American Meats Institute. Animal Care and Handling conference. Westin Crown Center, Missouri.
24. **Johnson, A. K**., S. Millman, L. A. Karriker, K. J. Stalder and J. Coetzee. 2010. Lameness, pain and behavior. Zinpro Feet-First. Sow Lameness Symposium II. Minnesota.
23. Stalder, K. J. A. K. Johnson and L. A. Karriker. 2010. Selection of gilts: Biomechanics. Zinpro Feet-First. Sow Lameness Symposium II. Minnesota.
22. **Johnson, A. K**., L. A. Karriker and K. J. Stalder 2009. George A Young Swine Conference. How are behavioral measures being used to assess swine well-being during research and commercial practice? Sioux City, IA. Eight-minute news release on the University of Nebraska, Lincoln. Market Journal. Observation of swine behavior. Available at: http://marketjournal.unl.edu/081409
21. Ritter, M. J., M. Ellis, and **A. K. Johnson**. 2009. Transporting more dollars to the bank. American Association of Swine Practitioners Annual Meeting, Texas
20. **Johnson, A. K**. 2009. Pig Improvement Company meeting. Is it possible to introduce behavioral measures onto sires and dams to incorporate into the Estimated Breeding Value program? International Federation of National Swine, Tennessee.
19. **Johnson, A. K**. 2009. Insight on how animal welfare may be approached within the sow herd: What are the target traits and how are they measured? International Federation of National Swine, Tennessee.
18. Stalder, K. J., A. K. Johnson, and L. A. Karriker. 2008. Sow housing options for the future. Kentucky Pork Producers Conference, Kentucky.
17. Berry, N*., **A. Johnson**, J. Hill, T. Baas, L. Karriker and K. Stalder. 2008. Loading system, effect on performance, handling and meat quality attributes of finisher pigs. Minnesota Pork Producers Meeting, Minnesota.
16. Stalder, K. J., R. C. Lacy, R. F. Fitzgerald, M. T. Nikkilä1, **A. K. Johnson**, and L. A. Karriker. 2008. Feet First Symposium. Early exit from the herd: Economic implications. Sponsored by Zinpro. Minnesota.
15. Stalder, K., L. Karriker, **A. Johnson**, M. Rothschild, B. Mote, and T. Serenius. 2008. Sow longevity: Genetic and phenotypic selection considerations. American Association of Swine Practitioners Annual Meeting, California.
14. **Johnson, A. K**. 2008. What does the future hold? Centennial speaker on Animal Behavior and Well-Being. American Society of Animal Science, Indiana.
13. **Johnson, A. K**. 2008. Effects of facility design on the stress response of the market weight pig at the farm during loading and unloading. Allen D. Leman Swine Conference. Minnesota.
12 **Johnson, A. K**. 2007. Sow housing: What are my options for farrowing and gestation? Annual meeting for the North Carolina Pork Producers, North Carolina.
11. Johnson, A. K. 2007. Animal welfare in the real world: On farm audits and assessments. Presentation to the Judging competition, Michigan.
10. Berry, N*. **A. Johnson**, J. Hill, T. Baas, L. Karriker and K. Stalder. 2007. Loading gantry versus traditional chute for the finisher pig: Effect on welfare parameters at time of marketing. Allen D. Leman Swine Conference, Minnesota.
9. Sadler, L*., J. Garvey*, T. Uhlenkamp*, R. Edler, T. Holck, P. DuBois and A. Johnson. 2007. Drinker to nursery pigs' ratio: Effects on drinking behavior and performance. Allen D. Leman Conference Minnesota.
8. Lonergan, S., E. Huff-Lonergan, and **A. K. Johnson**. 2006. Pork Quality. Prepared for the 2006 American Meats Institute, Animal Care and Handling Conference, Kansas.
7. Lonergan, S., E. Huff-Lonergan, and **A. K. Johnson**. 2006. Relationship between swine handling and pork quality: The role of postmortem muscle biochemical changes. Prepared for the 2006 American Meats Institute International Meat Animal Welfare Research Conference, Kansas.

INTERNATIONAL (N = 6; Butters-Johnson presented 4)

6. Stalder, K., L. Karriker, and **A. Johnson**. 2010. Sow management and maximizing longevity. Proc. Manitoba Swine Seminar. Manitoba Swine Seminar Committee, Winnipeg, Manitoba, Canada.
5. **Johnson, A. K**. 2010. Professor M. Rothschild, Distinguished Professor and M. E. Ensminger Endowed Chair to speak at the Ensminger International Conference titled Adapting animal production to changes for a growing human population to present on Standards for Animal Welfare Management. May 19 to 21, 2010 Lleida, Spain.
4. Ritter, M. J., and **A. K. Johnson**. 2009. Facility design and transport: the welfare connection. Livestock Transport conference. Calgary, Canada.
3. **Johnson, A. K**. Chair at the International Society of Applied Ethology titled; Indicators of animal welfare. July 7 2008 Dublin Ireland.1.
2. **Johnson, A. K**. 2008. Setting the farm animal welfare scene in North America. 8th International Livestock Environment Symposium. American Society of Applied Engineers to be their keynote speaker on farm animal welfare events in North America. The Brazilian government paid for business related expenses. September 1 to 5 2008, Iguassu Falls Brazil. Rio de Janeiro, Brazil.
1. **Johnson, A. K**. 2008. Iowa Pork Producers Association to attend a one-week trip around Denmark. The objective was to review and observe the free access stall system used for gestating sows and to garner information that can be used by the pork producers in the state of IA if they wish to retrofit or build loose housed sow systems. August 16 to 23 2008, Denmark.

*****Prior to appointment at ISU available upon request (n = 28)*****

EXTENSION TRAINING ACTIVITIES: PROFESSOR TO SEVEN-YEAR REVIEW 2024 (N = 14)

28. **Johnson, A. K.** Pork Quality Assurance Plus V.4. Advisor certification training sessions. The certification process requires attendance at a daylong training session and passing an exam at the conclusion of that session.

a. **Johnson, A. K.,** and C. Rademacher. 2019. Hansen learning center, Iowa State University, Ames, Iowa. 40 attendees.
b. **Johnson, A. K.,** and C. Rademacher. 2019. ISU Extension Office, Orange City, Iowa. 47 attendees.
c. **Johnson, A. K.,** and C. Rademacher. 2019. Hansen learning center, Iowa State University, Ames, Iowa. 39 attendees.
d. **Johnson, A. K.,** and C. Rademacher. 2019. Hansen learning center, Iowa State University, Ames, Iowa. 21 attendees.
e. **Johnson, A. K.,** and C. Rademacher. 2019. Hansen learning center, Iowa State University, Ames, Iowa. 12 attendees.
f. **Johnson, A. K.,** and C. Rademacher. 2020. Hansen learning center, Iowa State University, Ames, Iowa. 21 attendees.
g. **Johnson, A. K.,** and C. Rademacher. 2020. Online learning, Ames, Iowa. 12 attendees.
h. **Johnson, A. K.,** and C. Rademacher. 2020. Online learning, Ames, Iowa. 4 attendees.
i. **Johnson, A. K.,** and C. Rademacher. 2020. Online learning, Ankeny, Iowa. 17 attendees.
j. **Johnson, A. K.,** and C. Rademacher. 2020. Online learning, Ames, Iowa. 12 attendees.
k. **Johnson, A. K.,** and C. Rademacher. 2020. Online learning, Ames, Iowa. 4 attendees.
l. **Johnson, A. K.,** and C. Rademacher. 2021. Online learning, Ames, Iowa. 40 attendees.
m. **Johnson, A. K.,** and C. Rademacher. 2021. Online learning, Ankeny, Iowa. 12 attendees.
n. **Johnson, A. K.,** and C. Rademacher. 2021. Online learning, Ankeny, Iowa. 18 attendees.

EXTENSION TRAINING ACTIVITIES: P & T REVIEW (OCTOBER 2010 TO JUNE 2011), ASSOCIATE PROFESSOR TO FULL PROFESSOR SUBMISSION (N = 17)

27. **Johnson, A. K.,** and B. Drescher. 2017. America Veterinary Medical Association: Intercollegiate Animal Welfare Judging/Assessment contest. https://awjac.org/ November 18th – 19th Iowa State University hosted the annual contest. 147 participants attended (142 students and 5 America Veterinary Medical Association members. There were 18 teams in the undergraduate division, 10 teams in the veterinary division and 6 teams in the graduate division and 5 participants competing as individuals. The following schools were represented: Atlantic Veterinary College UPEI, Berry College, Colorado State

University, University of Guelph, Iowa State University, Michigan State University, The Ohio State University, University of Pennsylvania, Purdue University, Texas A & M, Truman State University, University of California-Davis, University of British Columbia, University of Illinois, University of Kentucky, University of Minnesota, University of Tennessee, and the University of Wisconsin-Madison.

26. **Johnson, A. K.,** and C. Rademacher. 2018. Family Center, Iowa State Fairgrounds, Des Moines, Iowa. 11 attendees. Pork Quality Assurance Plus V.3. Advisor certification training sessions. The certification process requires attendance at a daylong training session and passing an exam at the conclusion of that session.
25. **Johnson, A. K.,** and C. Rademacher. 2018. Hansen learning center, Iowa State University, Ames, Iowa. 20 attendees. Pork Quality Assurance Plus V.3. Advisor certification training sessions. The certification process requires attendance at a daylong training session and passing an exam at the conclusion of that session.
24. **Johnson, A. K.,** and C. Rademacher. 2017. Hansen learning center, Iowa State University, Ames, Iowa. 13 attendees. Pork Quality Assurance Plus V.3. Advisor certification training sessions. The certification process requires attendance at a daylong training session and passing an exam at the conclusion of that session.
23. **Johnson, A. K.,** and C. Rademacher. 2017. Hansen learning center, Iowa State University, Ames, Iowa. 6 attendees. Pork Quality Assurance Plus V.3. Advisor certification training sessions. The certification process requires attendance at a daylong training session and passing an exam at the conclusion of that session.
22. **Johnson, A. K.,** and C. Rademacher. 2016. Hansen learning center, Iowa State University, Ames, Iowa. 40 attendees. Pork Quality Assurance Plus V.3. Advisor certification training sessions. The certification process requires attendance at a daylong training session and passing an exam at the conclusion of that session.
21. **Johnson, A. K.,** and C. Rademacher. 2016. Borlaug Learning Center, Nashua, Iowa. 21 attendees. Pork Quality Assurance Plus V.3. Advisor certification training sessions. The certification process requires attendance at a daylong training session and passing an exam at the conclusion of that session.
20. **Johnson, A. K.,** and C. Rademacher. 2016. Washington county extension office, Washington, Iowa. 22 attendees. Pork Quality Assurance Plus V.3. Advisor certification training sessions. The certification process requires attendance at a daylong training session and passing an exam at the conclusion of that session.
19. **Johnson, A. K.,** and M. Benjamin. 2016. Fair grounds, Des Moines, Iowa. 40 attendes. Pork Quality Assurance Plus V.3. Advisor certification training sessions. The certification process requires attendance at a daylong training session and passing an exam at the conclusion of that session.
18. **Johnson, A. K.,** and C. Rademacher. 2016. Hansen learning center, Iowa State University, Ames, Iowa. 70 attendees. Pork Quality Assurance Plus V.3. Advisor certification training sessions. The certification process requires attendance at a daylong training session and passing an exam at the conclusion of that session.
17. **Johnson, A. K.,** and C. Rademacher. 2016. Hansen learning center, Iowa State University, Ames, Iowa. 26 attendees. Pork Quality Assurance Plus V.3. Advisor certification training sessions. The certification process requires attendance at a daylong training session and passing an exam at the conclusion of that session.
16. **Johnson, A. K.** Shadow Auditor for the Common Swine Industry Audit, administered by the Professional Animal Auditor Certification Organization. Dr. Johnson's role is to observe the trainees and complete a written report that is submitted to Collette Kaster C.E.O. for the Professional Animal Auditor Certification Organization. Krieger, A. Director Animal Welfare; JBS LLC. One breeding and one non-breeding phase.
15. **Johnson, A. K.** Shadow Auditor for the Common Swine Industry Audit, administered by the Professional Animal Auditor Certification Organization. Dr. Johnson's role is to observe the trainees and complete a written report that is submitted to Collette Kaster C.E.O. for the Professional Animal

Auditor Certification Organization. Garcia-Marquez, A. Research Assistant at Texas Tech University in the Department of Animal and Food Sciences. One breeding and one non-breeding phase.

14. **Johnson, A. K.** Shadow Auditor for the Common Swine Industry Audit, administered by the Professional Animal Auditor Certification Organization. Dr. Johnson's role is to observe the trainees and complete a written report that is submitted to Collette Kaster C.E.O. for the Professional Animal Auditor Certification Organization. Battrell, M. Chief veterinarian for the East Division of Smithfield Hog Production. One breeding and one non-breeding phase.
13. **Johnson, A. K.** Shadow Auditor for the Common Swine Industry Audit, administered by the Professional Animal Auditor Certification Organization. Dr. Johnson's role is to observe the trainees and complete a written report that is submitted to Collette Kaster C.E.O. for the Professional Animal Auditor Certification Organization. Yake, M. Animal Care Program Manager for Smithfield Hog Production. One breeding and one non-breeding phase.
12. **Johnson, A. K.** Shadow Auditor for the Common Swine Industry Audit, administered by the Professional Animal Auditor Certification Organization. Dr. Johnson's role is to observe the trainees and complete a written report that is submitted to Collette Kaster C.E.O. for the Professional Animal Auditor Certification Organization. Cassandra Jass. Animal Well-Being Director for Iowa Select Farms. One breeding and one non-breeding phase.
11. **Johnson, A. K.** 2013. Swine Welfare School. On-farm Euthanasia. Dr. Sadler was the lead instructor and was supported by other key professionals with expertise in swine medicine, swine science and euthanasia procedures. The participants were composed of key Iowa swine experts, including all Iowa State University Swine Field Specialists. Additionally, training aids were created and provided to help these individuals as they proceed to future educating of Iowa swine producers. The participants self-reported highly favorable reviews. Iowa State Veterinary School, Ames, IA. Friday 13th December 2013.

EXTENSION TRAINING ACTIVITIES: ASSISTANT PROFESSOR 2005 TO P & T SUBMISSION OCTOBER 2010 (N = 10)

10. **Johnson, A. K.** 2008. Gestation sow housing systems in Denmark, 2008. Presentation at the professional swine development conference. Iowa Pork Producers Association Annual Meeting. Des Moines, Iowa.
9. **Johnson, A. K**. 2007. Pork Quality Assurance Plus training to become an Instructor Trainer for Iowa.
8. **Johnson, A. K.** 2007. PQA-Plus Training for Iowa Instructor Training Team. Held at the National Pork Board.
7. **Johnson, A. K.**, L. Karriker, and K. Stalder. 2007. Pork Quality Assurance Plus training. Meeting with Jeff Hill Director of Animal Welfare for Premium Standard Farms to discuss training the system in Texas, Missouri and North Carolina.
6. **Johnson, A. K.**, K. J. Stalder and J. Hill. 2007. Pork Quality Assurance Plus training to Production Supervisors in Clinton, North Carolina. 38 persons trained.
5. Johnson, A. K., and J. Hill. 2007. Pork Quality Assurance Plus training to Production Supervisors in Princeton Missouri. 31 persons trained.
4. **Johnson, A. K.**, J. McKean, and J. Hill. 2007. Pork Quality Assurance Plus training to Production Supervisors in Amarillo Texas. 6 persons trained.
3. **Johnson, A. K.,** and J. McKean. 2007. Pork Quality Assurance Plus training for advisors. Held at the Iowa State University veterinary school. 45 persons trained.
2. **Johnson, A. K**., and J. McKean. 2007. Pork Quality Assurance Plus training, Iowa State University, Ames, Iowa. 31 persons trained.
1. **Johnson, A. K.**, and J. McKean. 2006. American Association of Swine Veterinarians. Swine Welfare Assurance Program™ Certified Training. Orlando, Florida. 60 persons trained.

TEACHING (25% OF APPOINTMENT)

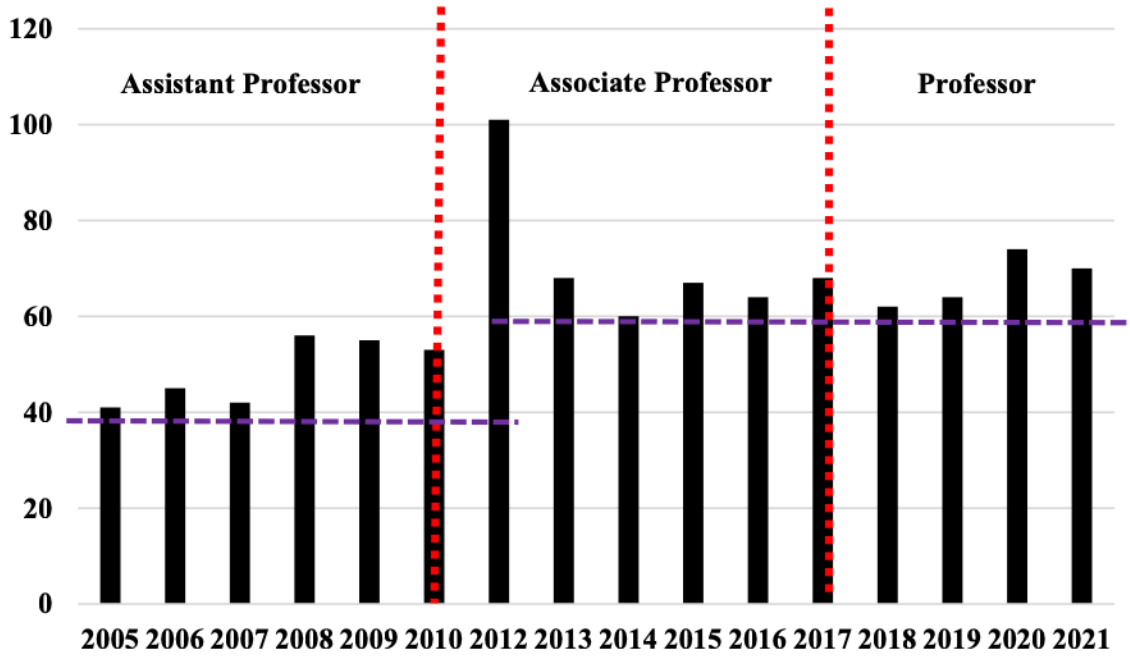
Dr. Butters-Johnson publishes under her maiden name of Johnson
Some publications the author will be A. Johnson and for others it will be A. K. Johnson

ISI has not provided impact factors for 2017, so 2016 impact factor have been provided
****Notation placed by name that I was serving as major or co-major professor, serving on their Program of Studies Committee (POS) or was their direct supervisor***
^Notation placed by name that I was serving as Faculty mentor
[#]Notation on publications placed by name, I served as corresponding author

PRIMARY TEACHING ASSIGNMENTS

Animal Science 336: Domestic Behavior and Well-Being. Sole Instructor (Section AJ). Taught only in the fall. 3 credit hours. Elective. Concern about the well-being of domesticated animals has increased dramatically in the United States and across many other industrialized countries. The issues involved are complex and there is widespread disagreement both as to the extent of human responsibilities toward animals and how those responsibilities should be carried out. Although human ethical attitudes are an important part of the dialogue about animals in this course we will not deal directly with human values, but will instead attempt to look at the problem from the animals' point of view. Who are animals? What can they experience? How can management practices and environments be modified to improve the well-being of animals? We will attempt to gain some basic skills and perspective in this course that can enable us to begin addressing these questions systematically). The class is taught in four sections; section one: the foundation of animal well-being, section two: global ways that humans try to protect animals, section three: animals and their interaction with the environment and section four species specific behavior and well-being.

Student enrollment[*] for Animal Science 336 (n = 990 students).



*Maximum enrollment for the Animal Science 336 class from 2005 to 2010 was 50. This increased to 60 students in 2012. [#]Dr. Butters-Johnson did not teach in 2011 as she was on maternity leave. Dr. Butters-Johnson taught twice in 2012; Spring 55 and Fall 46 students to accommodate students that were graduating in spring 2012.

Animal Science 336 – Honors level

Professor (July 2018) to seven-year review (N = 5)

7. 2021. Jans, K. Use of a feeder by nursery pigs provided with a nutritional environmental enrichment. *Outcome: A subset of videos from 3 pens holding 10 pigs per pen were reviewed using 10-second instantaneous scan sampling for the presence of a pig's head in the feeder for the first hour of enrichment placement over Days 0 to 6.*
6. 2021. Ratneva, K. Use of a feeder by nursery pigs provided with a nutritional environmental enrichment. *Outcome: A subset of videos from 3 pens holding 10 pigs per pen were reviewed using 10-second instantaneous scan sampling for the presence of a pig's head in the feeder for the first hour of enrichment placement over Days 0 to 6.*
5. 2021. Scallon, A. Use of a feeder by nursery pigs provided with a nutritional environmental enrichment. *Outcome: A subset of videos from 3 pens holding 10 pigs per pen were reviewed using 10-second instantaneous scan sampling for the presence of a pig's head in the feeder for the first hour of enrichment placement over Days 0 to 6.*
4. 2020. Burrows, H. Neonatal enrichment from D2 to D5: Effect on behavior. *Outcome: Videos of 12 sows over Day 2 were analyzed utilizing an ethogram that captured active, inactive and rope usage.*
3. 2018. Hiller, M. Suckling piglet comfort when given a heat mat vs. a heat lamp: Effects on welfare and cost implementation. *Outcome: Still images from four sows and their litters were be analyzed utilizing an ethogram.*

P & T review (October 2010 to June 2011), Associate Professor to Full Professor submission (N = 2)

2. 2017. Jones, B. Suckling piglet comfort when given a heat mat vs. a heat lamp: Effects on welfare and cost implementation. *Outcome: Expected one Animal Industry Report to be submitted November 2018.*
1. 2017. Root, B. LPS challenge in broiler birds: Effects of feeding omega-3 rich diets. *Outcome: Expected one Animal Industry Report to be submitted November 2018.*

Animal Science 490-A. Independent Studies in Animal Science. Sole Instructor (Section AJ). 1 to 3 credit hours (repeatable for maximum of 6 credits). Elective. Can be taken spring summer and fall. Open to juniors and seniors in animal science and dairy science showing satisfactory preparation for problems chosen. Individual topic conference and preparation of report.

Professor (July 2018) to seven-year review (N = 12)

76. 2022. Ostrander, M. Nursery pig interactions with a nutritional enrichment device placed over the feeder. *Objective: To determine the frequency and duration of nursery piglet interaction with an environmental enrichment biscuit and rope placed on the feeder. Outcome: Video will be reviewed for interactions with enrichment in the nursery pen. Data will be collected using excel.*
75. 2021. Streeter, A. Nursery pig interactions with a nutritional enrichment device placed over the feeder. *Objective: To determine the frequency and duration of nursery piglet interaction with an environmental enrichment biscuit and rope placed on the feeder. Outcome: Video will be reviewed for interactions with enrichment in the nursery pen. Data will be collected using excel.*
74. 2020. Puff, S. Neonatal pig interactions with a rope enrichment in the farrowing stall. *Objective: To determine the frequency and duration of neonatal piglet interaction with an environmental enrichment rope with different attractants. Outcome: Video will be reviewed for interactions with enrichment in the nursery pen. Data will be collected using excel.*
73. 2020. Phillips, M. Neonatal pig interactions with a rope enrichment in the farrowing stall. *Objective: To determine the frequency and duration of neonatal piglet interaction with an environmental enrichment rope with different attractants. Outcome: Video will be reviewed for interactions with enrichment in the nursery pen. Data will be collected using excel.*
72. 2020. Frick, C. Neonatal pig interactions with a rope enrichment in the farrowing stall. *Objective: To determine the frequency and duration of neonatal piglet interaction with an environmental enrichment rope with different attractants. Outcome: Video will be reviewed for interactions with enrichment in the farrowing stall. Data will be collected using excel.*

71. 2020. Diaz-Miranda, D. Validating laser environmental enrichment effects on broiler chicken welfare and performance outcomes. *Objective: To compare broiler bird's walking distance when provided with an environmental enrichment laser device versus the control. Outcome: Video will be reviewed of home pen behavior (active, inactive, feeding and drinker). A total of 3,136 minutes (52-hours) will be reviewed for one focal bird. Data will be collected by Observer.*
70. 2020. Olson, K. Validating laser environmental enrichment effects on broiler chicken welfare and performance outcomes. *Objective: To compare broiler bird's home pen behavior when provided with an environmental enrichment laser device versus the control. Outcome: Video will be reviewed of home pen behavior (active, inactive, feeding and drinker). A total of 3,136 minutes (52-hours) will be reviewed for one focal bird. Data will be collected by Observer.*
69. 2019. Stilwell, C. Suckling piglet comfort when given a heat mat vs. a heat lamp: Effects on welfare and cost implementation. *Outcome: Live observations to collect sow and piglet behavioral data (n = 20). Assist with performance measures collection, data entry and managing sows and piglets.*
67. 2018. Bagby, B. Suckling piglet comfort when given a heat mat vs. a heat lamp: Effects on welfare and cost implementation. *Outcome: Still images from 4 sows and their litters will be analyzed utilizing an ethogram.*
66. 2018. Dodd, C. Suckling piglet comfort when given a heat mat vs. a heat lamp: Effects on welfare and cost implementation. *Outcome: Still images from 4 sows and their litters will be analyzed utilizing an ethogram.*
65. 2018. Drew, L. Suckling piglet comfort when given a heat mat vs. a heat lamp: Effects on welfare and cost implementation. *Outcome: Still images from 4 sows and their litters will be analyzed utilizing an ethogram.*
64. 2018. Parker, E. Suckling piglet comfort when given a heat mat vs. a heat lamp: Effects on welfare and cost implementation. *Outcome: Still images from 4 sows and their litters will be analyzed utilizing an ethogram.*

P & T review (October 2010 to June 2011), Associate Professor to Full Professor submission (N = 43)

63. 2018. Prusak-Dziopala, J. Suckling piglet comfort when given a heat mat vs. a heat lamp: Effects on welfare and cost implementation. *Outcome: Still images from 36 sows and their litters will be downloaded and images cut. PIGCHAMP data over 12-months cycle for the ISU teaching farm will be entered.*
62. 2018. Root, B. Suckling piglet comfort when given a heat mat vs. a heat lamp: Effects on welfare and cost implementation. *Outcome: Still images from 36 sows and their litters will be reviewed to a written ethogram. Behavioral data will be used by Ms. Lane in her MS thesis.*
61. 2018. Stanton, K. Rat Effects of dietary vitamin E on oxidative stress, learning cognition, and nutrient composition in young feeder rats. *Outcome: Assisted Ms. Iske with data collecting data over spring 2018, reviewed video of rats moving the 8-radial maze when presented with differing feed. This data will be used by Ms. Iske in her Ph.D. dissertation.*
60. 2017. Prusak-Dziopala, J. Suckling piglet comfort when given a heat mat vs. a heat lamp: Effects on welfare and cost implementation. *Outcome: ISU Swine Teaching Farm training protocols to be rewritten and available for spring 2018. Assisted Ms. Lane with data collecting data over fall 2017. Performance data was collected on 36 sows and their litters. This data will be used by Ms. Lane in her MS thesis.*
59. 2017. Doty, K. Dynamic space requirements for non-lame and lame sows determined by lying standing lying sequence profile. *Outcome: Expected one Animal Industry Report to be submitted November 2017.*
58. 2016. Shonka, W. *Student completed 2-h per calving event (48 calving events) or 96-h total. Expected one Animal Industry Report to be submitted November 2017.*
57. 2016. Siberski, C. *Student completed 2-h per calving event (48 calving events) or 96-h total. Expected one Animal Industry Report to be submitted November 2017.*

56. 2016. Edwards, E. *Student completed 2-h per calving event (48 calving events) or 96-h total. Expected one Animal Industry Report to be submitted November 2017.*
55. 2016. Nall, J. *Student completed 2-h per calving event (48 calving events) or 96-h total. Expected one Animal Industry Report to be submitted November 2017.*
54. 2016. Elsbernd, L. *Student completed 2-h per calving event (48 calving events) or 96-h total. Expected one Animal Industry Report to be submitted November 2017.*
53. 2016. Benge, M. *Student completed 2-h per calving event (48 calving events) or 96-h total. Expected one Animal Industry Report to be submitted November 2017.*
52. 2016. Lesher, O. *Student completed 2-h per calving event (48 calving events) or 96-h total. Expected one Animal Industry Report to be submitted November 2017.*
51. 2016. Dooley, B. *Outcome: Student completed 2-h per calving event (48 calving events) or 96-h total. Expected one Animal Industry Report to be submitted November 2017.*
50. 2015. Smith, C. *Outcome: Student completed 5,400 minutes (90-h) of video watching and learnt how to enter data, Q/A data into excel.*
49. 2015. Annen, J. *Outcome: Peer reviewed extension publication #146.*
48. 2015. Martens, K. *Outcome: Peer reviewed extension publication #146.*
47. 2015. Mercer, P. *Outcome: Peer reviewed extension publication #147.*
46. 2015. Haritos, A. *Outcome: Peer reviewed extension publication #147:*
45. 2015. Strong, E. *Outcome: Peer reviewed extension publication #158.*
44. 2015. Evangelista, B. *Outcome: Peer reviewed extension publication #159.*
43. 2015. Schaffer, M. *Outcome: Peer reviewed extension publication #145.*
42. 2015. Springman, K. *Outcome: Peer reviewed extension publication #147.*
41. 2015. Rangel, A. *Outcome: Peer reviewed extension publication #146.*
40. 2015. Kiefer, Z. *Outcome: Peer reviewed extension publication #159.*
39. 2015. Elliott, C. *Outcome: Student completed 5,400 minutes (90-h) of video watching and learnt how to enter data, Q/A data into excel.*
38. 2015. Howell, A. *Outcome: Student completed 5,400 minutes (90-h) of video watching and learnt how to enter data, Q/A data into excel.*
37. 2014. Myers, S. *Outcome: Peer reviewed extension publication #136.*
36. 2013. Alexander, G. *Outcome: Learnt how to use the Observer XT program and viewed video for 3 sows showing oral-nasal and locomotor stereotypic behaviors. Data was collected, QA and given to Dr. Pairis-Garcia.*
35. 2013. Buer, D. *Outcome: Peer reviewed extension publication #131.*
34. 2013. Culbertson, M. *Outcome: Peer reviewed extension publication #131.*
33. 2013. Farruggio, E. *Outcome: Peer reviewed extension publication #130.*
32. 2013. Hamlin, S. *Outcome: Peer reviewed extension publication #130.*
31. 2013. Schroeder, H. *Outcome: Peer reviewed extension publication #131.*
30. 2013. Yehling, B. *Outcome: Peer reviewed extension publication #131.*
29. 2013. Schubert, J. *Outcome: Peer reviewed extension publication #120.*
28. 2013. Kaiser, A. *Outcome: Peer reviewed extension publication #122.*
27. 2013. Sholar, J. *Outcome: Peer reviewed extension publication #129.*
26. 2013. Welch, L. *Outcome: Review video of sows at feeding time to determine how lameness affects the time to approach feed in multiparous sows.*
25. 2012. Dougherty, H. *Outcome: Peer reviewed extension publication #117.*
24. 2011. Dougherty, H. *Outcome: Peer reviewed extension publication #98, 99, 100.*
23. 2011. den Hart, R. *Outcome: Peer reviewed extension publication #98, 99, 100.*
22. 2011. Ball, S. *Outcome: Peer reviewed extension publication #98, 99, 100.*
21. 2011. Stabenow, A. A day of rescue. *Outcome: Poster: A Day of Rescue: A Survey of Iowa Animal Shelters and Rescues and the Volunteer Experience.*

Assistant Professor 2005 to P & T submission October 2010 (N = 20)

20. 2010. Elsbernd, A. *Outcome: Peer reviewed extension publication #86, 95.*
19. 2010. Campbell, K. *Outcome: Veterinary Department of Production Animal Medicine: 480 Swine Medicine Clinical Rotation.*
18. 2010. Thomas, L. *Outcome: Peer reviewed extension publication #95.*
17. 2009. Salazar, M. *Outcome: Peer reviewed extension publication #84, 87.*
16. 2009. Scheeder, J. *Outcome: Data collected was used by Dr. Pairis-Garcia (Ph.D. student).*
15. 2010. Carson, B. *Outcome: Peer reviewed extension publication #64, 65.*
14. 2009. Rasmussen. Ethogram of nursery pigs housed in a conventional nursery. *Outcome: credits for the course.*
13. 2009. Swift, A. Ethogram of nursery pigs housed in a conventional nursery. *Outcome: credits for the course.*
12. 2009. Salazar, M. *Outcome: Data collected was used by Mr. L. Sadler (MS student).*
11. 2009. Wilder, A. *Outcome: Data collected was used by Mr. L. Sadler (MS student).*
10. 2009. Schauer, C. *Outcome: Literature review on substance P in the pig. That was used in a grant submission to the United States Department of Agriculture. The grant was funded on the first attempt in 2011 for $700,000 #44.*
9. 2009. Weimer, S. *Outcome: Peer reviewed extension publication #51, 66.*
8. 2008. Witte, R. *Outcome: Peer reviewed extension publication #75.*
7. 2008. Holiday, A. *Outcome: Research reports for the National Hog Farmer; Hemicellulose diet alteration and the effects on behavior of the growing-finishing pig and piglet mortality in a farrowing hut.*
6. 2008. Peterson, M. *Outcome: Peer reviewed extension publication #34.*
5. 2008. Witte, R. *Outcome: Peer reviewed extension publication #29.*
4. 2008. Kline, J. *Outcome: Peer reviewed extension publication #29.*
3. 2007. Uhlenkamp, T. *Outcome: Peer reviewed extension publication #34.*
2. 2007. Garvey, J. *Outcome: Peer reviewed extension publication #20, 35.*
1. 2006. Arp, A. *Outcome: Peer reviewed extension publication #67:*

Animal Science 490-H. Sole Instructor (Section AJ). Cr. 1-3. Repeatable, maximum of 6 credits. F.S.SS. Prerequisite: p**ermission of the instructor.** Open to juniors and seniors in animal science and dairy science showing satisfactory preparation for problems chosen. Individual topic conference and preparation of report. A maximum of 6 credits of An S 490 may be applied toward the total credits required for graduation.

Professor (July 2018) to seven-year review (N =3)

6. 2021. Geary, A. Use of biologically relevant enrichment to improve the weaning transition of nursery-aged swine. *Objective: To determine if the biologically relevant enrichment maintains novelty and affects performance for the weaned nursery pig over the first seven days. Outcome: Video will be reviewed for enrichment use in the nursery pen. Data will be collected using Google Sheets. The data will be used in an Honors capstone project/poster. The poster will be presented at the Honors session in December 2021. Results will also be written up into an AIR (animal industry report) co-authored by Miss Geary.*
5. 2021. Mercer, G. The influence of environmental enrichment on piglet behavior during early weaning. *Objective: To determine the frequency and duration of nursery piglet aggressive and abnormal behaviors after weaning. Outcome: Video will be reviewed for aggressive and abnormal behaviors in the nursery pen. Data will be collected using Observer XT. The student will also assist with project setup and implementation on farm Swine environmental enrichment resources were located. The booklet was composed of three main chapters: 1) the weaning process in piglets, 2) abnormal behaviors that arise from weaning, and 3) the use of environmental enrichment. It included pictures or diagrams to display different environmental enrichment devices that are used in the swine industry. Data was*

used in an Honors capstone project/poster. Miss Mercer presented her poster at the Honors session December 2020.

P & T review (October 2010 to June 2011), Associate Professor to Full Professor Submission (n = 4)

4. 2018. Bartlett, E. Suckling piglet comfort when given a heat mat vs. a heat lamp: Effects on welfare and cost implementation. *Outcome: Still images from 6 sows and their litters will be reviewed to a written ethogram. A total of 18 sows and their litters will have birth/weaning weights collected and causes of death will be determined. Data was used in an Honors capstone project/poster and also by Ms. Lane in her MS thesis. Miss Bartlett presented her poster at the Honors session May 2018.*
3. 2017. Deal, M. How to educate the public while providing a portable environmentally enriched wagon to A North American Porcupine. *Outcome: Miss Deal helped create the research white paper, completed an IACUC, and collected the data. Two Animal Industry Reports have been written and will be submitted November 2017. Miss. Deal presented her poster at the Honors session May 2017.*
2. 2012. Dierks, C. Evaluation of the Effect of Vaccination Side on Subsequent Halter Breaking Side Preference in Cattle. *Outcome: Miss Dierks helped create the research white paper, completed an IACUC, and collected the data. Animal Industry Report #131 was published. Miss. Dierks presented her poster at the Honors session May 2012.*
1. 2012. Bender, A. The effects of environmental enrichment during the holding period of shelter dogs on adoption rate. *Outcome: Awarded $750 from a Steward. Miss Bender helped create the research white paper, completed an IACUC, and collected the data. Animal Industry Report #118 was published. Miss. Bender presented her poster at the Honors session May 2012.*

Animal Science 495 and Animal Science 496A: European perspectives on farm animal welfare in England and Scotland

An S 495. Agricultural Travel Course Preparation. Co-instructor with Dr. L. Kilmer. Cr. R. Repeatable. F.S. Prerequisite: permission of instructor. Limited enrollment. Students enrolled in this course will also register for Agron 495 and intend to register in Agron 496 and An S 496 the following term. Topics will include the agricultural industries, climate, crops, culture, history, livestock, marketing, soils, and preparation for travel to locations to be visited. Information normally available 9 months before departure. An S 496A. Agricultural Travel Course; International Tour. Co-instructor with Dr. L. Kilmer Cr. arr. Repeatable. *Prereq: Permission of instructor, 30 college credits.* Limited enrollment. Students enroll in both An S 496 and Agron 496. Tour and study of production methods in major crop and livestock regions of the world. Influence of climate, economics, geography, soils, landscapes, markets, and other factors on livestock and crop production. Locations and duration of tours will vary. Summer tour will usually visit a northern location and winter tour will usually visit a southern location. Information usually available 9 months before departure. Tour expenses paid by students.

A total of 12 junior/senior students participated in this course. In addition, Ms. S. Niekamp, Director for Animal Welfare at the National Pork Board requested to attend the class. The objective for attending this course was (1) to become updated on swine welfare events occurring within the European Union and (2) to provide an update to the Vice President of Science and Technology at the National Pork Board on possible organizations for the Board to visit in 2011.

Animal Science 497. Undergraduate Teaching Experiences in Animal Science. Sole Instructor (Section AJ). Cr. 1-2. Repeatable, maximum of 4 times. F.S.SS. Prerequisite: permission of instructor. Development of oral and written communication skills of technical concepts in animal science. Emphasis on organizational skills, conducting activities and interpersonal communication skills. Responsibilities in a class under direct supervision of a faculty member. A maximum of 4 credits of An S 497 may be applied toward graduation.

Professor (July 2018) to seven-year review (N = 10)

19. 2021. Hotzler, Briana, AnS 336. Domestic Animal Behavior and Well-Being.
18. 2020. Koenig, Joeli, AnS 336. Domestic Animal Behavior and Well-being.
17. 2020. Mercer, Grace, AnS 336. Domestic Animal Behavior and Well-being.
16. 2019. Van Der Heyden, Jessica, AnS 336. Domestic Animal Behavior and Well-being.
15. 2019. Mason, Kaitlyn, AnS 336. Domestic Animal Behavior and Well-being.
14. 2019. Hiller, Megan, AnS 336. Domestic Animal Behavior and Well-being.
13. 2019. Dodd, Carrie, AnS 336. Domestic Animal Behavior and Well-being.
12. 2019. Sarinana, Connie, AnS 336. Domestic Animal Behavior and Well-being.
11. 2018. Jen, Danielle, AnS 336. Domestic Animal Behavior and Well-being.
10. 2018. Susseman, Erica, AnS 336. Domestic Animal Behavior and Well-being.

P & T review (October 2010 to June 2011), Associate Professor to Full Professor Submission (N = 7)
9. 2017. Rodriguez-Avila, K. AnS 336. Domestic Animal Behavior and Well-being.
8. 2017. Snyder, A. AnS 336. Domestic Animal Behavior and Well-being.
7. 2015. Strong, E. AnS 336. Domestic Animal Behavior and Well-being.
6. 2015. Cuevas, M. AnS 336. Domestic Animal Behavior and Well-being.
5. 2014. Yehling, B. AnS 336. Domestic Animal Behavior and Well-being.
4. 2014. Welch, B. AnS 336. Domestic Animal Behavior and Well-being.
3. 2012. Place, K. AnS 336. Domestic Animal Behavior and Well-being.

Assistant Professor 2005 to P & T submission October 2010 (N = 2)
2. 2008. Meiszberg. AnS 336. Domestic Animal Behavior and Well-being.
1. 2008. Peterson, M. AnS 336. Domestic Animal Behavior and Well-being.

Animal Science 537 A to F. Topics in Farm Animal Environmental Physiology, Behavior, Stress and Welfare. Co-Instructor. Cr. 3-0. Repeatable. F. S. Open to graduating seniors, MS & Ph.D. students. Prerequisite: permission of instructor. Each semester, the students' focus is on different topics related to animal behavior, animal welfare and contemporary issues related to animal behavior and welfare. Each topic is separate and distinct, and students may enroll in multiple topics. This is an on-line course only. Each topic may be taken only one time for credit.
Maximum enrollment for the Animal Science 537 class was 5 per semester (2006 to 2008). These numbers were only for Iowa State University students, they did not include student enrollment from the University of Illinois or Texas Tech University. Fall 2009 and spring 2010 it was Dr. J. Salak-Johnson turn to instruct and lead the course. Dr. J. Salak-Johnson decided to not offer the course these semesters. In the late spring 2010 Dr. Salak-Johnson decided not to offer this course anymore through Illinois and Dr. Sutherland (Texas Tech University) left the U.S. and took up a position in the welfare department of the New Zealand government. In 2011, Dr. Butters-Johnson redesigned the course to offer four sub sections and enrollment was not caped.

Animal Science 537 A to D. Topics in animal behavior, welfare and contemporary issues in animal behavior and welfare. Sole Instructor (Section AJ). Cr. 3-0. Repeatable. Alt. S. Elective. Open to graduating seniors, MS & Ph.D. students. Prerequisite: permission of instructor. Each semester, the students' focus is on different topics related to animal behavior, animal welfare and contemporary issues related to animal behavior and welfare. Each topic is separate and distinct, and students may enroll in multiple topics. This is an on-line course only. Each topic may be taken only one time for credit. AnS 537-A: Animal Behavior, AnS 537-B: Contemporary issues in animal behavior & welfare, AnS 537-C: Animal Welfare and AnS 537-D: Immune and stress. Dr. Butters-Johnson is lead instructor for AnS 537-A to C and Dr. J. Cunnick is lead instructor for AnS 537-D.

Student enrollment* for Animal Behavior 537-A from 2011, 2012, 2015, 2017, 2019 & 2021 (N = 87 students). Enrollment was not met in 2013 and class was not offered.

AnS 590L. Special topics: Teaching. Sole Instructor (Section AJ). Cr. 1-3. Repeatable. F.S.SS. Prerequisite: permission of instructor. Special topics in the animal sciences offered on demand and may be conducted by guest professors.

Professor (July 2018) to seven-year review (N = 4)

9. 2020. Wiersema, M. Teaching Assistant AnS 336. Animal Behavior and Well-being. *Outcome: Lectured on Poultry Behavior and Welfare and the Poultry Laboratory. Teaching assistant for one laboratory section and graded laboratory assignments. Assisted with creating and grading class quizzes and exams. Reviewed and edited PowerPoint slides and class manual.*
8. 2020. Sundman, E. Teaching Assistant AnS 336. Animal Behavior and Well-being. *Outcome: Lectured on Environmental enrichment (two lectures). Teaching assistant for one laboratory section and graded laboratory assignments. Assisted with creating and grading class quizzes and exams. Reviewed and edited PowerPoint slides and class manual.*
7. 2020. Moeller, G. Teaching Assistant AnS 336. Animal Behavior and Well-being. *Outcome: Lectured on Animal Movement, Assessment and Audit Programs and Transport losses during Marketing. Teaching assistant for one laboratory section and graded laboratory assignments. Assisted with creating and grading class quizzes and exams. Reviewed and edited PowerPoint slides and class manual.*
6. 2018. Akin, E. Teaching Assistant AnS 336. Animal Behavior and Well-being. *Outcome: Lectured on PQA Plus and ran the sow welfare assessment labs. Teaching assistant for one laboratory section and graded laboratory assignments. Assisted with creating and grading class quizzes and exams. Reviewed and edited PowerPoint slides and class manual.*

P & T review (October 2010 to June 2011), Associate Professor to Full Professor Submission (N = 5)

5. 2013. Pairis-Garcia, M. Teaching Assistant AnS 336. Animal Behavior and Well-being. *Outcome: Created a new veterinary forensics lecture/lab series and lectured on euthanasia. Teaching assistant for one laboratory section and graded laboratory assignments. Assisted with creating and grading class quizzes and exams. Reviewed and edited PowerPoint slides and class manual.*
4. 2013. Colpoys, J. Teaching Assistant AnS 336. Animal Behavior and Well-being. *Outcome: Created a new sheep laboratory and lectured on psychological stress. Teaching assistant for one laboratory section and graded laboratory assignments. Assisted with creating and grading class quizzes and exams. Reviewed and edited PowerPoint slides and class manual.*
3. 2012. Davis, R. Teaching Assistant AnS 336. Animal Behavior and Well-being. *Outcome: Lectured on Transport losses. Supported laboratory two. Assisted with creating and grading class quizzes and exams. Teaching assistant for one laboratory section and graded laboratory assignments.*
2. 2012. Mohling, C. Teaching Assistant AnS 336. Animal Behavior and Well-being. *Outcome: Lectured on swine well-being and animal movement. Supported laboratory one. Assisted with creating and grading class quizzes and exams. Teaching assistant for one laboratory section and graded laboratory assignments. Created an extra credit case study: comparing two swine production systems for welfare.*
1. 2012. Roca, A. Teaching Assistant AnS 336. Animal Behavior and Well-being. *Outcome: Lectured on euthanasia. Teaching assistant for one laboratory section and graded laboratory assignments. Assisted with creating and grading class quizzes and exams.*

Animal Science 590-N. Special Topics: Ethology. Sole Instructor (Section AJ). Cr. 1-3. Repeatable. F.S.SS. Prerequisite: permission of instructor. Special topics in the animal sciences, offered on demand and may be conducted by guest professors.

Professor (July 2018) to seven-year review (N = 2)

13. 2020. Yarian, J. *Credits: 3. Expectations: Weekly meetings with Dr. Butters-Johnson, taught how to conduct a thorough literature search, took a library training course on setting up literature reviews, discussed how to read and critique a peer review paper. Outcome: Literature review for Masters: Investigating strategies in training swine caretakers for psychological well-being and Mexican swine caretakers' attitudes, behaviors, and perceptions toward euthanasia.*
12. 2019. Sundman, E. *Credits: 3. Expectations: Weekly meetings with Dr. Butters-Johnson, taught how to conduct a thorough literature search, took a library training course on setting up literature reviews, discussed how to read and critique a peer review paper. Outcome: Literature review for Masters: Environmental enrichment to improve swine survivability.*

P & T review (October 2010 to June 2011), Associate Professor to Full Professor Submission (N = 7)

11. 2017. Akin, E. *Credits: 3. Expectations: Weekly meetings with Dr. Butters-Johnson, taught how to conduct a thorough literature search, took a library training course on setting up literature reviews, discussed how to read and critique a peer review paper. Outcome: Literature review for Masters: Humane handling tools for the non-ambulatory market weight pig.*
10. 2017. Oliveira, J. 2017. *Credits: 3. Expectations: Weekly meetings with Dr. Butters-Johnson, taught how to conduct a thorough literature search, took a library training course on setting up literature reviews, discussed how to read and critique a peer review paper. Outcome: Literature review: Impact of feeder space on laying hen feeding behavior and feed intake.*
9. 2012. Colpoys, J. *Credits: 3. Expectations: Weekly meetings with Dr. Butters-Johnson, taught how to conduct a thorough literature search, took a library training course on setting up literature reviews, discussed how to read and critique a peer review paper. Outcome:* Literature review: Feed efficiency, stress and animal welfare.
8. 2012. Davis, R. *Credits: 3. Expectations: Weekly meetings with Dr. Butters-Johnson, taught how to conduct a thorough literature search, took a library training course on setting up literature reviews, discussed how to read and critique a peer review paper. Outcome:* Literature review: Transportation of the market weight pig: Factors that influence transportation losses.
7. 2012. Garcia-Pairis, M. *Credits: 3. Expectations: Weekly meetings with Dr. Butters-Johnson, taught how to conduct a thorough literature search, took a library training course on setting up literature reviews, discussed how to read and critique a peer review paper. Outcome:* Literature review: The role of substance P in the pain cascade.
6. 2012. Roca, A. *Credits: 3. Expectations: Weekly meetings with Dr. Butters-Johnson, taught how to conduct a thorough literature search, took a library training course on setting up literature reviews, discussed how to read and critique a peer review paper. Outcome:* Literature review: Comparing and contrasting behavioral changes in lame and sound sows.
5. Weimer, S. 2011. *Credits: 3. Expectations: Weekly meetings with Dr. Butters-Johnson, taught how to conduct a thorough literature search, took a library training course on setting up literature reviews, discussed how to read and critique a peer review paper. Outcome:* Literature review: Approach vs. fear in farm animals.

Assistant Professor 2005 to P & T submission October 2010 (N = 4)

4. 2010. Dickey, E. *Credits: 3. Expectations: Weekly meetings with Dr. Butters-Johnson, taught how to conduct a thorough literature search, took a library training course on setting up literature reviews, discussed how to read and critique a peer review paper. Outcome: Literature review: Behavior, physiology and performance of laying hens under differing molting schemes.*
3. Sadler, L. 2009. *Credits: 3. Expectations: Weekly meetings with Dr. Butters-Johnson, taught how to conduct a thorough literature search, took a library training course on setting up literature reviews, discussed how to read and critique a peer review paper. Outcome: Literature review: Residual Feed Intake and behavioral alterations.*

2. 2009. Gesing, L. *Credits: 3. Expectations: Weekly meetings with Dr. Butters-Johnson, taught how to conduct a thorough literature search, took a library training course on setting up literature reviews, discussed how to read and critique a peer review paper. Outcome: Literature review: handling factors that influence transport losses in the market weight pig.*
1. 2006. Goldsmith, C. *Credits: 3. Expectations: Weekly meetings with Dr. Butters-Johnson, taught how to conduct a thorough literature search, took a library training course on setting up literature reviews, discussed how to read and critique a peer review paper. Outcome: Literature review: Drinking behaviors of nursery aged pigs.*

STUDENT EVALUATIONS FOR ANS 336 AND ANS 537-A

Student evaluation Summary for Animal Science 336 Domestic Animal Behavior & Well-Being and Animal Science 537-A Animal Behavior. Instructor rating based on overall instructor metric question #13 *"overall, this course has been effective in advancing my learning."*

Semester/Year	Course Number	Credit	IR[1]	Departmental means
Fall 2021	ANS 336	3	4.89	4.18
Spring 2021	ANS 537-A-X (online)	3	5.00	.[7]
Fall 2020[8]	ANS 336	3	4.64	4.27
Fall 2019	ANS 336	3	4.86	4.08
Fall 2018	ANS 336	3	4.97	4.10
Spring 2018	ANS 537-A (campus)	3	4.00	.[7]
Spring 2018	ANS 537-A-X (online)	3	5.00	.[7]
Spring 2017[2]	ANS 537-A	3	4.22	4.37
Fall 2016	ANS 336	3	4.83	4.23
Fall 2015[3]	ANS 336[4]	3	4.70	4.25
Fall 2014	ANS 336	3	4.67	4.09
Fall 2013	ANS 336	3	4.94	4.22
Fall 2012	ANS 336	3	4.54	4.20
Spring 2012[5]	ANS 336	3	4.65	4.14
Spring 2012	AnS 537-A[4]	3	4.00	4.37
Spring 2011	AnS 537-A	3	4.20	.[6]

[1]IR = overall instructor effectiveness 1 = not effective 5 = very effective.
[2]Students that enroll in ANS 490-A, ANS 490-H, ANS 497/590-L and ANS 590-L did not provide ranking.
[3]E-mail communication with Dr. Scofield, Director Brenton Center for Agriculture Instruction & Technology Transfer (13th July 2017), noting that there were no evaluations collected for AnS 537-A, Spring 2015.
[4]ANS 336 is Animal Behavior & Well-Being. ANS 537-A IS Animal Behavior.
[5]Dr. Butters-Johnson was on maternity leave.
[6]Dr. Kenealy the Animal Science Curriculum Coordinator did not provide the departmental mean for Graduate courses.
[7]Departmental means were not provided for Graduate courses.
[8]Due to COVID-19 ANS 336 moved to a 100% online format.

Student evaluation for AnS 336 Domestic Animal Behavior and Well-Being. Instructor rating based on overall instructor metric question #13 *"overall, this course has been effective in advancing my learning."* (*no department [Dept.] averages provided for the fall 2005) Scale: Excellent =10 Poor = 1)

Semester/Year	Course Number	Credit	IR[1]	Departmental means

Fall 2009	ANS 336	3	9.59	8.37
Fall 2008	ANS 336	3	9.59	8.31
Fall 2007	ANS 336	3	9.42	8.84
Fall 2006	ANS 336	3	9.28	8.64
Fall 2005	ANS 336	3	9.35	.

[1]IR = overall instructor effectiveness 1 = not effective 5 = very effective.
[2]Students that enroll in ANS 490-A, ANS 490-H, ANS 497/590-L and ANS 590-L did not provide ranking.

UNDERGRADUATE POSTERS (N=8)

Professor (July 2018) to seven-year review (N = 4)

8. Geary A*., Stambuk, C*. Sundman, E*., and **A. Johnson**. 2021. Use of biologically relevant enrichment to improve the weaning transition of nursery-aged swine. Senior Honors Project, presented at Iowa State University Honors Poster Presentation, Ames, IA.
7. Mercer, G., C*. Stambuk, E*. Sundman and **A. Johnson**. 2021. Effects of novel nutritional enrichment on pig feeder aggression during early weaning. Senior Honors Project, presented at Iowa State University Honors Poster Presentation, Ames, IA.
6. Barkley, M. M., M. M. Meyer*, **A. K. Johnson** and E. A. Bobeck^. 2019. Measuring latency to feed of broilers after exposure to an environmental enrichment device. Senior Honors Project, presented at Iowa State University Honors Poster Presentation, Ames, IA.
5. Stigers, K., J. Lee, J. Prusak-Dziopala, A. Steffen, M. Serao and **A. Johnson**. 2018. Positive Reinforcement Training as a Part of a Standard Operating Procedure for a Nutrition Trial in a Research Dog Colony. Fall. Undergraduate Research Poster. Department of Animal Science, Ames, IA.

P & T review (October 2010 to June 2011), Associate Professor to Full Professor Submission (n = 4)

4. Bartlett H 2018. Spring.
3. Dierks 2012
2. Bender Allie 2012
1. Myers, S., **A. K. Johnson** and J. Colpoys. 2015. Barrow and Gilt vocalization during a human approach test. Tuesday 14th April, 2015. Ames, IA.

SCIENCE WITH PRACTICE (N = 3)

Professor (July 2018) to seven-year review (N = 1)

3. Stilwill, C. 2018. *Role: Trained and collected sow and piglet behavior data. Worked on data collection. Expectations: Available at http://www.ageds.iastate.edu/content/science-practice-swp Outcome:* Stilwill, C., A. Johnson and K. Lane. 2018. Suckling piglet comfort when given a heat mat vs. a heat lamp: Effects on welfare and cost implementation. Poster presented at the Science with Practice Poster Presentation, Dec. 5, 2018, Iowa State University.

P & T review (October 2010 to June 2011), Associate Professor to Full Professor Submission (n = 2)

2. Sholar, J. 2013. *Role: Worked on the Residual Feed Intake project. Expectations: Available at http://www.ageds.iastate.edu/content/science-practice-swp Outcome:* Sholar J. F., J. D. Colpoys, N. K. Gabler, A. F. Keating, S. T. Millman, J. M. Siegford, and **A. K. Johnson**. 2013. Gilt approachability to a human when selecting for feed efficiency. Poster presented at the Science with Practice Poster Presentation, Dec. 11, 2013, Iowa State University.
1. Jenkins, J. 2012. *Role: Worked on the Residual Feed Intake project. Expectations: Available at http://www.ageds.iastate.edu/content/science-practice-swp . Outcome: Jenkins, J., **A. K. Johnson**, N. Gabler and J. Siegford. NOT and HAT for barrows selected for feed efficiency. First place poster for Science with Practice. Wednesday 7th December 2011. Kildee Hall, Ames IA.*

UNDERGRADUATE RESEARCH ASSISTANTSHIPS (N = 2)

2. 2020-2021. Hartoonian, P. Neonatal pig interactions with a rope enrichment in the farrowing stall. *Objective: To determine the frequency and duration of neonatal piglet interaction with an environmental enrichment rope with different attractants. Outcome: Video will be reviewed for interactions with enrichment in the nursery pen. Data will be collected using excel. The student will also assist with project setup and implementation on farm.*
1. 2020-2021. Christiansen, K. Neonatal pig interactions with a rope enrichment in the farrowing stall. *Objective: To determine the frequency and duration of neonatal piglet interaction with an environmental enrichment rope with different attractants. Outcome: Video will be reviewed for interactions with enrichment in the nursery pen. Data will be collected using excel. The student will also assist with project setup and implementation on farm.*

GRADUATE STUDENT ADVISING

Currently serving as Co-Major Professor on Program of Study **(N = 1)**

9. Carlson, K. 2021. **Master in Progress,** Agricultural Education. Major Professors Dr. A. Johnson and Dr. S. Smalley.

Currently Serving as Program of Study Committee Member **(N = 6)**

6. Jeon, R. **Doctorate in Progress**, Agricultural and Biosystems Engineering Department, Iowa State University. Major Professor Dr. J. Peschel.
5. Zhaoyang, C. **Doctorate in Progress**, Agricultural and Biosystems Engineering Department, Iowa State University. Major Professor Dr. J. Peschel.
4. Handa, D. **Doctorate in Progress**, Agricultural and Biosystems Engineering Department, Iowa State University. Major Professor Dr. J. Peschel.
3. Stock, J. **Doctorate in Progress**, Animal Science, Iowa State University. Major Professor Dr. K. Stalder.
2. Folks, K. **Doctorate in Progress**, Ecology & Evolutionary Biology, Iowa State University. Major Professor Dr. B. Klaver and Dr. J. Pruetz.
1. Davis, S. **Master in Progress (thesis)**, Animal Science, Iowa State University. Major Professor Dr. P. Hoffman.

Completed: Served as Program of Study Major Professor **(N = 11)**

11. Sundham, E. **Master of Science (thesis)** completed 2021. Physiology Major with a specialization in Ethology, Department of Animal Science, Iowa State University. "*Environmental enrichment to improve swine survivability."*
10. Yarin, J. **Master of Science (thesis)** completed 2021. Physiology Major with a specialization in Ethology, Department of Animal Science, Iowa State University. "*Investigating strategies in training swine caretakers for mental well-being and Mexican swine caretakers' attitudes, behaviors, and perceptions toward euthanasia."*
9. Akin, E. **Master of Science (thesis)**, completed 2019. Physiology Major with a specialization in Ethology, Department of Animal Science, Iowa State University. "*Providing humane on-farm handling tools to move non-ambulatory grow-finish pigs.*"
8. Roca, A., **Master of Science (thesis)**, completed 2015. Physiology Major with a specialization in Ethology, Department of Animal Science, Iowa State University. "*Sow behavior when in sound and painful states of transient lameness*."
7. Pairis-Garcia, M. D., **Doctorate, Completed 2014**. Physiology Major with a specialization in Ethology, Department of Animal Science, Iowa State University. "*Advancing techniques to promote the welfare of sows utilized in laboratory-based lameness models*."
6. Mohling, C., **Master of Science (thesis)**, **Completed 2013**. Physiology Major with a specialization in Ethology, Department of Animal Science Iowa State University. "*Developing validated and objective industry-ready tools to assess joint pain manifestation and lameness in the sow."*

5. Kephart, R., **Master of Science (thesis)**, **Completed 2013**. Physiology Major with a specialization in Ethology, Department of Animal Science, Iowa State University. "*Establishing Bedding and Boarding Requirements for Finisher Pigs through scientific validation – macro-study*."
4. Weimer, S., **Master of Science (thesis)**, **Completed 2012**. Physiology Major with a specialization in Ethology, Department of Animal Science, Iowa State University. "*Willingness to Approach: Live human observation vs. digital image*."
3. Gesing, L., **Master of Science (thesis)**, **Completed 2010**. Physiology Major with a specialization in Ethology, Department of Animal Science, Iowa State University. "*Pre-sorting and pen size effects on the stress responses at loading and unloading and transport losses in market weight pigs*."
2. Sadler, L., **Master of Science (thesis)**, **Completed 2009**. Physiology Major with a specialization in Ethology, Department of Animal Science. "*The effect of selection for residual feed intake on general behavioral activity, occurrence of lesions, scale activity and exit score in Yorkshire gilts*."
1. Jackson, C., **Master of Science (thesis)**, **Completed 2007**. Physiology Major Department of Animal Science, Iowa State University. "*Drinking behavior in nursery aged pigs*."

Completed: Served as Program of Study Co-Major Professor **(N = 5)**

5. Moeller, G. **Master of Science (thesis), Completed 2020**. Animal Science, Iowa State University. Co-majoring with Dr. K. Stalder. "*Estimating the repeatability and reproducibility of subjectively evaluated feet and leg soundness traits in growing replacement gilts.*"
4. Lane, K. **Master of Science (thesis), Completed 2019**. Animal Science, Iowa State University. Co-majored with Dr. K. Stalder. "*Heat lamps and heat mats in the farrowing house: Effect on piglet production, piglet and sow behavior and energy usage.*"
3. Iske, C. **Doctorate, Completed 2018**. Animal Science, Iowa State University. Co-majored with Dr. C. Morris. "*Influence of nutrient intake on oxidative stress in zoo-managed species.*"
2. Colpoys, J., **Doctorate, Completed 2015**. Animal Science, Iowa State University. Co-majored with Dr. N. Gabler. "*Approach behavior of pigs when selected for residual feed intake*."
1. Dickey, E., **Master of Science (thesis)**, **Completed 2008**. Animal Science, Iowa State University. Co-majored with Dr. K. Bregendahl. "*Evaluation of a calcium pre-molt and low-energy molt program: Effects on laying hen behavior, production, and physiology before, during, and after a fasting or non-fasting molt.*"

Completed: Served as Program of Study Committee Member **(N = 41)**

41. Nickel, M. **Master of Science (thesis). Completed 2021.** Department of Veterinary Animal Production. "*Improving data for making antimicrobial selection decisions in swine.*" Major Professor Dr. L. Karriker.
40. Heiderscheit, K. **Doctorate, Completed 2021.** Animal Science. "*The newly received feedlot steer: The influence of transportation, zinc supplementation, and diet composition on growth performance and behavior."* Major Professor Dr. S. Hansen.
39. Wuebker, W. **Master of Science (thesis). Completed 2021.** Animal Science. "*Analysis of piglet survivability as sow productivity traits in Landrace and Large White breeds."* Major Professor Dr. K. Stalder.
38. Maraghehmoghaddam, A. **Doctorate, Completed 2020.** Agricultural Biosystems Engineering. "*Synthetic video data generation for deep learning model training to understand livestock behavior."* Major Professor Dr. J. Peschel.
37. Holmes, A. **Master of Science (non-thesis), Completed 2020**. Veterinary Diagnostic Animal Production Medicine. "*Pig behavior related to pen-based oral fluid sample collection*." Major Professor Dr. J. Zimmerman.
36. Leonard, S. **Doctorate, Completed 2020.** Agricultural Biosystems Engineering. "*Evaluation of swine gestation-farrowing facility space and management for improving production, welfare, and infectious disease containment.*" Co-major Professors, Dr. H. Xin and Dr. B. Ramirez.

35. Kittrell, H. **Doctorate, Completed 2020.** Veterinary Diagnostic and Production Animal Medicine with a major in Population Sciences in Animal Health. "*An investigation of the pharmacokinetics of flunixin meglumine in swine using noncompartmental analysis and nonlinear mixed effects modeling: an emphasis on pre-wean piglets*." Co Major Professors, Dr. L. Karriker and Dr. A. Ramirez.
34. Deters, E. **Doctorate, Completed 2020.** Animal Science, Iowa State University. "*Nutritional modulation of oxidative stress in beef steers during the feedlot receiving period: A focus on transit stress*." Major Professor, S. Hansen.
33. Forseth, A. **Master of Science (thesis). Completed 2020.** Veterinary Diagnostic & Animal Production Medicine, Iowa State University. "*Evaluation of diagnostic tools for naturally occurring lameness in swine*." Major Professor Dr. L. Karriker.
32. Scanlon, C. **Master of Science (non-thesis), Completed 2019**. Animal Science, Iowa State University. "*Genetic analysis of reproductive performance in sows during porcine reproductive and respiratory syndrome (PRRS) and porcine epidemic diarrhea (PED) outbreaks*." Major Professor, N. Serao.
31. Meyer, M. **Master of Science (thesis), Completed 2019**. Animal Science, Iowa State University. "*Novel environmental enrichment laser device stimulated broiler chicken active behavior and improved performance without sacrificing welfare outcomes.*" Major Professor Dr. E. Bobeck.
30. Wackerly, N. **Master of Science (thesis). Competed 2019.** Anthropology, Iowa State University. "*Bipedalism on the savanna: chimpanzee locomotion at Fongoli, Senegal and implications for the evolution of hominin bipedalism.*" Major Professor Dr. J. Pruetz.
29. Robinson, A., **Doctorate, Completed 2018.** Animal Science, Iowa State University. "*Investigating physiological parameters and management procedures in the periparturient period that affect subsequent performance in ungulate species*." Major Professor Dr. H. Tyler.
28. Olson, K., **Master of Science (thesis). Completed 2018.** Animal Science, Iowa State University. *"Investigating methods of evaluating swine feed additives; phytase and alternatives to antibiotic growth promoters."* Major Professor Dr. J. Patience.
27. Huntly, N., **Doctorate, Completed 2018.** Animal Science, Iowa State University. "*Swine carbohydrate metabolism in relation to dietary energy partitioning*." Major Professor Dr. J. Patience.
26. Mumm, J., **Master of Science (thesis), Completed 2017**. Animal Science, Iowa State University. "*Dynamic space requirements of lame and non-lame sows as determined by their lying-standing sequence profile*." Major Professor Dr. K. Stalder.
25. Ehr, I., **Master of Science (thesis). Completed 2017**. Animal Science, Iowa State University. *"Production and health response of laying hens and growing broilers to dietary omega-3-fatty acid supplementation."* Co-Major Professors Dr. E. Bobeck and Dr. H. Xin.
24. Wolfswinkel, T., **Doctorate, Completed 2016**. Animal Physiology, Iowa State University. "*The effects of feeding prebiotics, antibiotics, and alternative proteins during the pre-weaning period to dairy calves on growth, health, and the gastrointestinal microbiota*." Major Professor Dr. H. Tyler.
23. Soso, S., **Doctorate, Completed 2016**. Agricultural and Biosystems Engineering, Iowa State University. "*The chemistry and odor of semiochemicals: Studying the chemical and odor violative organic compound compositions of great cat marking fluid in an effort to aid tiger and lion conservation*." Major Professor Dr. J. Koziel.
22. Danielson, A., **Master of Science (thesis), Completed 2016**. Animal Science, Iowa State University. "*Best Management Practices Cleaning Guide for Livestock Trailers*." Major Professor Dr. K. Stalder.
21. Holloway, C., **Master of Science (thesis), Completed 2016**. Animal Science, Iowa State University. "*Impact of super-dosing phytase on growth performance, energy and nutrient utilization and phytate breakdown*." Major Professor Dr. J. Patience.
20. Wackerly, N., **Master of Science (thesis), Completed 2016**. Anthropology. "*Positional behavior of black-handed spider monkeys (Ateles geoffroyi), including a one-armed individual, at El Zota Biological Field station, Coast Rica*." Major Professor Dr. J. Pruetz.
19. Iske, C., **Master of Science (thesis), Completed 2015**. Animal Science, Iowa State University. "*Utilization of pork and pork by-products for nutritional and behavioral management of captive exotic felids*." Major professor Dr. C. Morris.

18. Bates, J., **Master of Science (thesis), Completed 2015**. Veterinary Diagnostic & Production Animal Medicine. "*Transmammary-delivered meloxicam in piglets undergoing castration and tail docking: Impact on pharmacokinetics and pain biomarkers*." Major professor Dr. L. Karriker.
17. Withrock, I., **Master of Science (thesis), Completed 2013**. Biomedical Sciences, Iowa State University. "*The use of carbon dioxide (CO_2) as an alternative euthanasia method for goat kids*." Major Professor Dr. S. Millman.
16. Newman, M., **Master of Science (thesis), Completed 2013**. Animal Science, Iowa State University. "*Defining the energy and nutrient content of corn grown in drought-stressed conditions and determining the relationship between energy content of corn and the response of growing pigs to xylanase supplementation*." Major Professor Dr. J. Patience.
15. Nikkilä, M., **Doctorate, Completed 2013**. Animal Science, Iowa State University. "*Gilt growth, compositional and structural soundness effects on sow productive lifetime*." Major Professor Dr. K. Stalder.
14. Sadler, L., **Doctorate, Completed 2013**. Biomedical Sciences, Iowa State University. "*Effects of flow rate, gas type and disease status on the welfare of suckling and weaned pigs during gas euthanasia*." Major Professor Dr. S. Millman.
13. Meiszberg, A., **Master of Science (coursework), Completed 2013**. Veterinary Diagnostic & Animal production Medicine, Iowa State University. Major Professor Dr. L. Karriker.
12. Petersen, M., **Master of Science (thesis), Completed 2013**. Sustainable Agriculture Program, Iowa State University. "*Undergraduate Education and Attitudes towards Swine Welfare*." Major Professor Dr. C. Flora.
11. Woods, J., **Master of Science (thesis), Completed 2012**. Veterinary Diagnostic & Animal production Medicine, Iowa State University. "*Analysis of the use of "CASH" dispatch kit captive bolt gun as a single stage euthanasia process for pigs*." Major Professor Dr. S. Millman.
10. Sowers, A., **Master of Science (thesis), Completed 2012**. Veterinary Diagnostic & Animal production Medicine, Iowa State University. "*Behavioral and physiological indicators of post-surgical pain – using behavioral and physiological measures to evaluate acute pain and distress following surgical portal vein catheterization in dairy calves*." Major Professor Dr. S. Millman.
9. Mack, L., **Doctorate, Completed 2012**. Animal Science, Purdue University. "*The influence of gestational housing on the behavior, physiology and welfare of the sow and her piglets*." Major Professor Dr. E. Pajor.
8. Youngs, J., **Doctorate, Completed 2011**. Animal Science, Iowa State University. "*The effect of selection for residual feed intake during the grow/finish phase of production on feeding behavior traits and sow reproduction and lactation efficiency in Yorkshire swine*." Major Professor Dr. J. Dekkers.
7. Layman, L., **Master of Science (coursework), 2011**. Veterinary Diagnostic & Animal production Medicine, Iowa State University. "A *systematic review of the evidence on the effectiveness of the treatment of lameness in sows."* Major Professor Dr. L. Karriker.
6. Elmore, E., **Doctorate, Completed 2010**. Animal Science, Purdue University. "*The impact of environmental enriched hosing on sow motivation, behavior and welfare*." Major Professor Dr. E. Pajor.
5. Fitzgerald, R., **Doctorate, Completed 2009**. Animal Science, Iowa State University. "*An evaluation of practices to improve sow productive lifetime and producer profitability*." Major Professor Dr. K. Stalder.
4. Bowden, J., **Master of Science (thesis), Completed 2009**. Veterinary Diagnostic & Animal production Medicine, Iowa State University. "*A systematic evaluation of the evidence for Porcine Reproductive and Respiratory Syndrome vaccine efficacy on reproductive performance in sows*." Major Professor Dr. L. Karriker.
3. Masker, C., **Master of Science (thesis), Completed 2008**. Agricultural Education & Studies, Iowa State University. "*Managing Replacement Gilts: A unit within the Sow Lifetime Productivity Management Guide*." Major Professor Dr. M. Retallick.

2. Green, A., **Doctorate, Completed 2008**. Agricultural Engineering, Iowa State University. "*A systematic evaluation of laying hen housing for improving hen welfare*." Major Professor Dr. H. Xin.
1. Berry, N., **Doctorate, Completed 2007**. Animal Science, Iowa State University. "*Loading system effect on performance handling and meat quality attributes of finisher pigs*." Major Professor Dr. T. Bass.

PREPARING FUTURE FACULTY (N = 4)

P & T review (October 2010 to June 2011), Associate Professor to Full Professor Submission (N = 4)

4. 2015. Robinson, A. Ph.D. Candidate. Major professor Dr. H. Tyler. *Credits: 3. Expectations: Met every other week to work on syllabi and lecture preparation, policies and teaching style, Promotion and Tenure expectations, teaching portfolio needs, preparing a rubrics and tests for class. Outcome: Student had to keep a log and present this to the instructor of record.*
3. 2013. Colpoys, J. Ph.D. Candidate. Major professor Dr. A. Johnson. *Credits: 3. Expectations: Met every other week to work on syllabi and lecture preparation, policies and teaching style, Promotion and Tenure expectations, teaching portfolio needs, preparing a rubrics and tests for class. Outcome: Student had to keep a log and present this to the instructor of record.*
3. 2012. Jones, C. Ph.D. Candidate. Major professor Dr. J. Patience. *Credits: 3. Expectations: Met every other week to work on syllabi and lecture preparation, policies and teaching style, Promotion and Tenure expectations, teaching portfolio needs, preparing a rubrics and tests for class. Outcome: Student had to keep a log and present this to the instructor of record.*
1. 2012. Pairis-Garcia, M. Ph.D. Candidate. Major professor Dr. A. Johnson. *Credits: 3. Expectations: Met every other week to work on syllabi and lecture preparation, policies and teaching style, Promotion and Tenure expectations, teaching portfolio needs, preparing a rubrics and tests for class. Outcome: Student had to keep a log and present this to the instructor of record.*

POST-DOCTORAL ASSOCIATE & AGRICULTURE TECHNICIAN (N = 7)

7. 2019 to present. Stambuk, C. Farm Animal Care and Well-being Postdoctoral Research Associate. 100% appointment.
6. 2018 to 2019. Jorgensen, M. Higher Education Competitive Grant Postdoctoral Research Associate. 100% appointment.
5. 2014 to 2018. Azarpajouh, S. Farm Animal Care and Well-being Postdoctoral Research Associate. 100% appointment.
4. 2016 to 2018. Forseth, A. Attorney Generals and Iowa Pork Producers Association. Postdoctoral Research Associate. 50% appointment.
3. 2013 to 2014. Sadler, L. Farm Animal Care and Well-being Postdoctoral Research Associate. 100% appointment.
2. 2011 to present. Parsons, R. Research Associate II. 25% appointment.
1. 2005 to 2007. Sadler, L. Agricultural Specialist I. 100% appointment.

CURRENT MENTORING (N = 5)

5. 2019 to present. Auwerda, P. Associate Professor Equine Science. Co-mentoring with Dr. S. Lamont.
4. 2019 to present. Ferwerda, N. Senior Lecturer. Co-mentoring with Dr. A. Keating.
3. 2018 to present. Greiner, L. Assistant Professor Poultry Nutrition. Co-mentoring with Dr. J. Ross.
2. 2017 to present. Bundy, J. Assistant Professor and Advising Coordinator. Co-mentoring with Dr. S. Marcketti.
1. 2016 to present. Bobeck, E. Assistant Professor Poultry Nutrition. Co-mentoring with Dr. S. Lamont.

COMPLETED MENTORING (N = 2)

2. 2012 to 2017. Schulz, K. Lecturer Co-mentoring with Dr. J. Sterle. Ms. Schulz resigned her position June 2017 to stay at home and raise her family.
1. 2012 to 2017. Gunn, P. Assistant Professor Cow-Calf specialist. Co-mentored with Dr. J. Reecy. Dr. Gunn resigned his position April 2017 to become a Beef Cattle Technical Consultant for Purina Animal Nutrition, Gray Summit Missouri.

GUEST LECTURING

No.	Course title	Title[1]	Semester(s)
ANS 190	Livestock Handling, Safety & Welfare	What is welfare?	2013 to 2017
ANS 190[2]	Livestock Handling, Safety & Welfare	Swine welfare	2013 to 2017
ANS 190[2]	Livestock Handling, Safety & Welfare	PQA Plus certification	2017
ANS 190[2]	Livestock Handling, Safety & Welfare	Compromised livestock	2020 to 2021
ANS 211	Issues facing Animal Science	Animal Well-being: What is the problem?	2006 to 2016, 2020 to 2021
ANS 224	Companion Animal Science	Dog & cat learning, training & measuring behavior	2006 to 2010
ANS 225	Swine Science	How to conduct a SWAP assessment	2006
		PQA Plus Certification	2018
		Swine behavior and its importance on-farm	2021
ANS 411[3]	Issues in Animal Science	Farm animal welfare capstone topics	2016
ANS 501	Survey of Animal Disciplines	Introduction to animal behavior & well-being at Iowa State University	2006 to 2014
BMS 407	Animal behavior	Swine behavior	2011 to 2019
ECON 362	Applied ethics in Agriculture	Animal welfare challenges & opportunities.	2005 to 2019
HORT 495		U.K.: Culture and history	2011
TSM 327	Study abroad England Animal Production Systems	Swine well-being challenges & opportunities	2007 to 2008
VCS 312	Veterinarian in Society	Behavioral indicators of welfare	2007 to 2020
VDPAM 465	Animal Welfare Rotation	On farm swine assessments & audits	2010[4] to 2021
VDPAM 480	Swine Production Medicine	Euthanasia	2018 to 2020
VDPAM564	Animal Welfare Science & Research	How has the U.S. swine industry responded to welfare issues: science, policy and education	2019 to 2020
TTU[5]	Seminar	Sow lameness: the road to today	2017
Animal Nutrition & Behavior club	Seminar	Swine drinking behavior	2015
B & B[11]	Animal learning day	Worked at the sheep station to teach about animal handling; point of balance, flight zone and blind spots. 1500 attendees for the day.	2016
B & G[6]	Seminar	Insight on how animal welfare may be approached within the sow herd: What are the target traits and how are they measured?	2011
Dairy[7]	Seminar	Dairy welfare issues: What is here and what is coming?	2010
AASV[8]	Seminar	Farrowing systems. Pros and cons	2012
AASV	Seminar	Handing on-farm abuse and neglect cases	2020
AASV	Seminar	What welfare issues face the U.S. swine industry?	2021
ISU[9]	Seminar	Behavior & handling	2012
AASV	Seminar	Well-being and behavior swine	2007

ISU	Seminar	Farm animal behavior: figuring out what an animal wants!	2007
AABP[10]	Seminar	Well-being and behavior of dairy and beef cattle and veal calves.	2006
B & B[11]	Seminar	Equine behavior and well-being	2006
Pre-Vet[11]	Seminar	Techniques of animal training	2006
Pre-Vet[12]	Seminar	Why do dogs behave the way they do?	2006

[1]All guest lectures consisted on one 50-minute lecture per semester.
[2]Swine welfare consists of a 1-h lecture and a 2-h lab.
[3]Dr. Butters-Johnson was the judge for the senior capstone projects. A total of 10 projects were critiqued and ranked. The review session lasted for 2-h.
[4]In 2010 & 2018 the Animal Welfare Rotation was taught twice. This rotation consists of one, 8-h day. A 2-h lecture is followed up but 6-h preparing for, on-farm debriefing after a swine welfare audit and the completion of the Common Swine Industry Audit for the farm.
[5]TTU = Texas Tech University: Department of Animal- and Food Sciences. Seminar to Graduate Students.
[6]B & G = Breeding and Genetics. Department of Animal Science. Graduate students.
[7]Dairy Club. Iowa State University. Department of Animal Science. Undergraduate students.
[8]AASV = American Association of Swine Veterinarians Student Club. Iowa State University: College of Veterinary Medicine.
[9]ISU = Iowa State University: College of Veterinary Medicine: Behavior club. Seminar to Veterinary Students.
[10]AABP = American Association Bovine Practitioners Student Chapter at Iowa State University veterinary college. Spring 2006.
[11]B & B = Block & Bridal. Iowa State University. Department of Animal Science. Undergraduate students.
[12]Pre-Vet = Pre-Veterinary Club. Iowa State University. Department of Animal Science. Undergraduate students.

POST-DOC AND STUDENT AWARDS (N = 18; $23,580)

19. Stambuk, C. 2021. Postdoctoral Research Excellent Award. Post-Doctoral Association and Graduate College. $100.
18. Yarian, J. 2020. Department of Animal Science Graduate Award for Outstanding Teaching.
17. Yarian, J. 2019. Graduate College Teaching Excellence Award.
16. Iske, C. 2017. Farm Bureau Graduate Fellowship. $10,000.
15. Colpoys, Jessie. 2016. Animal Science Young Animal Scholar Award. Midwest American Society of Animal Science. $250.
14. Colpoys, J. 2015. Association of Graduate Animal Scientists. Travel scholarship. $250.
13. Colpoys, J. 2015. Associate Certificate. Center for the Integration of Research, Teaching and Learning.
12. Colpoys, J. 2015. Duane and Shirley Acker International Fellowship graduate award. To foster international experiences for graduate students. $2,000.
11. Colpoys, J. 2015. Preparing Future Faculty Scholar, Iowa State University.
10. Colpoys, J. 2015. Print and Grace Powers Hudson Scholarship in Agriculture. $1,000.
9. Colpoys, J. 2015. Professional Advancement Grant. Iowa State University Graduate College. $180.
8. Colpoys, J. 2015. Research Excellence Award, Iowa State University Graduate College. $500.
7. Colpoys, J. 2014. Lauren L. Christian Graduate Fellowship. $3,000.
6. Colpoys, J. 2014. First place in the Ph.D. completion at the American Society of Animal Science Midwest meeting. $300.
5. Colpoys, J. 2014. Charles H. and I. M. Callahan memorial graduate award. For excellence in academic performance and outstanding leadership in extracurricular activities relating to poultry. $2,000.
4. Colpoys, J. 2013. Fourth place team in Graduate Student Division of Intercollegiate Animal Welfare Judging/Assessment Contest.
3. Colpoys, J. 2012. Charles H. and Inez M. Callahan Memorial Graduate Award. $2,000.

Colpoys, J. 2012. First place poster at Science with Practice Poster competition, Iowa State University.
2. Colpoys, J. 2012. Third place poster at the Department of Animal Science Iowa State University Undergraduate Poster competition.
1. Sadler, L. J. 2009 Charles H. and Inez M. Callahan memorial graduate award. For excellence in academic performance and outstanding leadership in extracurricular activities relating to poultry $2,000.

SCHOLARSHIP OF LEARNING AND TEACHING (N = 15)

Professor (July 2018) to seven-year review (N = 10)

23. **Johnson, A. K.** 2021. ANS 336 Domestic Animal Behavior and Well-Being, Introduction to the ISU-Dairy.
    - Welcome to the ISU-Dairy
    - Milking parlour and cow comfort
    - Calf management
    - Maternity barn
    - Lameness and treatments
22. **Johnson, A. K.** 2021. ANS 336 Domestic Animal Behavior and Well-Being Animal Rescue League.
    - Welcome to the ARL-Iowa
    - How are animals brought into the ARL?
    - Services
    - Enrichment
    - Legal cases
21. **Johnson, A. K.** 2021. ANS 336 Domestic Animal Behavior and Well-Being, updated class manual and completed a rubric for the peer evaluation for the environmental enrichment group project. CANVAS was updated so that modules = weeks, there was a welcome landing page and additional reading resources for the lectures and labs were added.
20. Burgett, C., and **A. K. Johnson**. 2021. Leading Learners. How to organize CANVAS. Presented to the Department of Animal Science.
19. **Johnson, A. K.** 2020. Transitioning ANS 336: Domestic Animal Behavior and Well-Being to an online course. Invited talk by Associate Dean Bain and the Brenton Center for the college of Agriculture and Life Sciences. https://vimeo.com/user42671352/review/492201908/12670de663
18. **Johnson, A. K.** 2020. ANS 336 Domestic Animal Behavior and Well-Being: Lab. Due to COVID-19 F2020 was moved into an online platform. Lab 9: PQA Plus was recorded with assistance from the Brenton Center (Kayser and Fischer) and made into a professional online learning platform.
17. **Johnson, A. K.** 2020. ANS 336 Domestic Animal Behavior and Well-Being: Lab. Due to COVID-19 F2020 was moved into an online platform. Lab 8: Lameness and cow comfort was recorded with assistance from the Brenton Center (Kayser and Fischer) and made into a professional online learning platform.
16. **Johnson, A. K.** 2020. ANS 336 Domestic Animal Behavior and Well-Being: Lab. Due to COVID-19 F2020 was moved into an online platform. Lab 4: Calf and older beef cattle handling was recorded with assistance from the Brenton Center (Kayser and Fischer) and made into a professional online learning platform.
15. **Johnson, A. K.** 2020. ANS 336 Domestic Animal Behavior and Well-Being: Lab. Due to COVID-19 F2020 was moved into an online platform. Lab 3: Designing the environment was recorded with assistance from the Brenton Center (Kayser and Fischer) and made into a professional online learning platform.
14. **Johnson, A. K.** 2020. ANS 336 Domestic Animal Behavior and Well-Being Mice handling and enrichment videos.
    - Habitat
    - Enrichment
    - Scruffing
    - Handling

- Plastic cone restraint
- Plastic tube restraint
- Trap door restraint

13. **Johnson, A. K.** 2020. How can I include retrieval into my online (and in-class room) teaching? Friday 13th March 2020. Center for Excellence in Learning and Teaching (CELT).
12. **Johnson, A. K.,** and L. Haskell. 2020. CELT Faculty spotlight. In our teaching tips, we highlight the work of successful instructors and staff from across Iowa State University. We have asked them to share their highlights from the classroom, ideas for successful teaching and learning, and share their favorite Center for Excellence in Learning and Teaching (CELT) program. Teaching and Learning Circle. Powerful learning tools: Unleash the science of learning.
11. **Johnson, A. K.** 2020. ANS 336 Domestic Animal Behavior and Well-Being, updated class manual. Added speaker and laboratory managers biographies, updated all of the manual for correct dates, added a new homework assignment on Marketing Turkeys and updated the lectures on law and legislation.
10. **Johnson, A. K.** 2019. ANS 336 Domestic Animal Behavior and Well-Being, updated class manual. Added speaker and laboratory managers biographies, updated the "careers in animal behavior and welfare".
9. **Johnson, A. K.** 2018. ANS 336 Domestic Animal Behavior and Well-Being, updated class manual to include a new terminology section.

P & T review (October 2010 to June 2011), Associate Professor to Full Professor Submission (N = 8)

8. **Johnson, A. K.** 2017. ANS 336 Domestic Animal Behavior and Well-Being, creation of the class manual.
7. **Johnson, A. K.** 2016. ANS 336 Domestic Animal Behavior and Well-Being, updated class manual.
6. **Johnson, A. K.** 2015. ANS 336 Domestic Animal Behavior and Well-Being, updated class manual.
5. **Johnson, A. K.** 2014. ANS 336 Domestic Animal Behavior and Well-Being, updated class manual.
4. **Johnson, A. K.** 2013. ANS 336 Domestic Animal Behavior and Well-Being, updated class manual.
3. **Johnson, A. K.** 2012. ANS 336 Domestic Animal Behavior and Well-Being, creation of the class manual.
2. **Johnson, A. K.** 2012. ANS 336 Domestic Animal Behavior and Well-Being. Creation of Study Mate for all lectures and labs that are within the online learning platform.
1. **Johnson, A. K.** 2011. ANS 336 Domestic Animal Behavior and Well-Being Animal Rescue League: Dog behavioral assessment.

COURSES TAKEN TO IMPROVE TEACHING & MENTORING SKILLS (N = 37)

37. f2f: Faculty-Faculty Mentoring Dialogues. Thursday 6th and Friday 7th May 2021. A total of 12 participants from IUPUI, Ball State, Cleveland State University of Cincinnati and Michigan State University attended. Midwest Experiences in Mentoring Excellence: An Aspire Program.
36. College of Agriculture and Life Sciences. How to use the communication tools in CANVAS to interact with your students. Friday 24th July 2020. Online with Mr. T. Vens.
35. College of Agriculture and Life Sciences. How to create quizzes and exams and use gradebook and speed grader. Thursday 23rd July 2020. Online with Mr. T. Vens.
34. College of Agriculture and Life Sciences. How to use CANVAS studio to make recordings for your course. Wednesday 22nd July 2020. Online with Mr. T. Vens.
33. College of Agriculture and Life Sciences. How to organize your course in CANVAS with the student in mind. Tuesday 21st July 2020. Online with Mr. T. Vens.
32. College of Agriculture and Life Sciences. How to setup and use WebEx in CANVAS. Monday 20th July 2020. Online with Mr. T. Vens.
31. Workshop on Applying the Quality Matters Rubric (APPQMR). Friday 27th April, 2018. Morrill Hall, Ames, Iowa.
30. Workshop: The pedagogy of Canvas quizzes. Thursday 22nd March 2018. Durham Center, Ames, Iowa.
29. Workshop: Course design in Canvas. Monday 19th March 2018. Durham Center, Ames, Iowa.

28. Workshop Creating groups in Canvas. Wednesday 7th March 2018. Parks Library, Ames, Iowa.
27. Workshop: Assignments and gradebook in Canvas. Wednesday 14th February 2018. Durham Center, Ames, Iowa.
26. The Best Practices in Online Course Design. Tuesday 20th, Wednesday 21st and Thursday 22nd June 2017. Curtis Hall, Ames, Iowa.
25. Blackboard learning: Clicker training. Thursday 14th September 2012. Communications building, Ames, Iowa.
24. Blackboard learning: Creating test pools quizzes and surveys for Black board learning. Thursday 3rd November 2011. Communications building, Ames, Iowa.
23. Blackboard learning: Organizing course content. Tuesday 21st June 2011. Communications building, Ames, Iowa.
22. Blackboard learning: Introduction to Blackboard learning. Monday 20th June 2011. Communications building, Ames, Iowa.
21. Adobe Acrobat Training. Tuesday 29th March 2011. Breton Center, Ames, Iowa.
20. Dog Behavior Evaluations in Shelters. Match-up II. Presented by Dr. A. Marder. Saturday 15th January 2011. Animal Rescue League-Iowa.
19. Peer evaluation of Teaching for the Department of Animal Science. Evaluated AnS 270 Fall 2011. This was to Beta test the forms that had been created by the Peer Evaluation of Teaching committee. The process was to (1) receive and review materials from the instructor of record (Dr. S. Lonergan) (2) Pre lecture meeting on what would be covered in that lecture to be observed, what were the learning outcomes and to establish format of the lecture to be delivered (3) Attend lecture and observe as if a student (4) Post lecture meeting to review the lecture and what was osberve3d and to clarify any questions and (5) to write up a formative teaching report that was shared with Dr. S. Lonergan. This Beta testing was then presented to faculty at the Departmental retreat November 2011.
18. Center for Excellence Learning and Teaching training on clicker technology in the classroom. 2009. Communication department of Iowa State University, Ames, Iowa.
17. Creating and managing WebCT Gold templates. 2006. Communication department of Iowa State University, Ames, Iowa. Instructor: Mr. Travis Kramer.
16. Student learning groups within WebCT Gold. 2006. Communication department of Iowa State University, Ames, Iowa. Instructor: Mr. Travis Kramer.
15. Overview of WebCT Gold assessment tools. 2006. Communication department of Iowa State University, Ames, Iowa. Instructor: Mr. Travis Kramer
14. Getting started with WebCT Gold. 2006. Communication department of Iowa State University, Ames, Iowa. Instructor: Mr. Travis Kramer.
13. Mastering the WebCT Gold Grade BOOK. 2006. Communication department of Iowa State University, Ames, Iowa. Instructor: Mr. Travis Kramer.
12. Overview of communication tools in WebCT Gold. 2006. Communication department of Iowa State University, Ames, Iowa. Instructor: Mr. Travis Kramer.
11. Designing a basic course in WebCT Gold. 2006. Communication department of Iowa State University, Ames, Iowa. Instructor: Mr. Travis Kramer.
10. WebCT course content delivery. 2005. Communication department of Iowa State University, Ames, Iowa. Instructor: Mr. Travis Kramer.
9. Creating and delivery quizzes / surveys with WebCT and Respondus. 2005. Communication department of Iowa State University, Ames, IA. Instructor: Mr. Travis Kramer.
8. Managing the WebCT gradebook. 2005. Communication department of Iowa State University, Ames, Iowa. Instructor: Mr. Travis Kramer.
7. Creating interactive study activities with Study mate. 2005. Communication department of Iowa State University, Ames, Iowa. Instructor: Mr. Travis Kramer.
6. Orientation to WebCT communication tools. 2005. Communication department of Iowa State University, Ames, Iowa. Instructor: Mr. Travis Kramer.

5. Orientation to WebCT for on-line learning and teaching. 2005. Communication department of Iowa State University, Ames, Iowa. Instructor: Mr. Travis Kramer.
4. University teaching seminar: helping you find tour direction at Iowa State University. 2005. Center for Excellence Learning and Teaching, Iowa State University, Ames, Iowa.
3. New faculty orientation for teaching at Iowa State University. August 15th 2005. Center for Excellence Learning and Teaching, Iowa State University, Ames, Iowa.
2. Farm animal well-being retreat between Iowa State University and University of Saskatoon. June 1st to 3rd, 2005 Prince Albert National Park, Saskatoon, Canada.
1. Experiential learning: Design through assessment. May 23 to 25th, 2005. Manhattan, College of Agriculture Kansas State University, Kansas.

CHANGES TO THE IOWA STATE UNIVERSITY TEACHING CATALOGUE (N = 2)

2. **2012. AnS 190 Livestock handling, safety and welfare:** Dr. Johnson and Dr. Sterle proposed a new course (1-2) CR.2. F.S.SS. Understanding of animal perception to develop best care practices involved in handling of livestock species (beef, sheep, swine, dairy, equine, poultry). Intensive development of skills associated with handling and moving healthy and compromised livestock in respect to human and animal welfare. Integration of scientific and theoretical knowledge of biosecurity and animal-human interactions as it relates to livestock handling and movement.

1. **2008. Major Animal Physiology with a specialization in Ethology:** Approved by the College of Agriculture and Life Science. In addition, Dr. Butters-Johnson added three Animal Science options; Animal Science 590N which is a special topics class (effect spring 2008), Animal Science 699J Research hours in Ethology (effect spring 2008) and Animal Science 537 A to F. Topics in Farm Animal Environmental Physiology, Behavior, Stress and Welfare that has now changed to Animal Science 537 A-D.

PROFESSIONAL PRACTICE

The candidate continues to provide leadership through her service on a number of wide-ranging Regional, National & International committees.

CURRENT COMMITTEE SERVICE (N = 17)

1. ***Animal Well-Being Advisory Committee.*** Iowa Select Farms. 2011 to present. A newly formed committee that Dr. Johnson chairs. Committee role includes third party auditing of the farms, reviewing all animal welfare policies, SOP's and written documents, oversee their educational and training programs on farm and to offer up to date scientific advice pertaining to swine welfare on farm.
2. ***Center for Food Integrity***. Animal Care Review Panel. 2012 to present. The Center for Food Integrity has created an Animal Care Review Panel to provide a balanced analysis of undercover video investigations. This process engages recognized animal care specialists to examine video and provide expert perspectives for food retailers, the pork industry and the media. The Panel will include a veterinarian, animal scientist and an ethicist animal scientist, a veterinarian and an ethicist to assure various perspectives are represented. http://www.foodintegrity.org/programs/pork-panel
3. ***Community of Practice: Ethology***. 2021 to present. National Ethologists to focus on teaching practice and scholarship of learning and teaching effectively in-person and online.
4. ***Iowa Farm Animal Care (I.F.A.C.).*** 2009 to present. Following from the efforts to assist veterinarians in their role under Iowa law for animal cruelty response, Dr. S. Millman identified a gap in terms of prevention of cases of animal neglect. Specifically, there were marginal cases in which animal care was poor, but not sufficiently outside the realms of customary animal care to warrant legal intervention. For companion animal cases, local animal shelters or animal control (i.e.: Animal Rescue League of Iowa) typically aided and oversight with a mandate to educate first and prosecute only when these attempts failed. There was no equivalent program available for livestock, due to lack of resources and expertise in the animal shelter community for advising livestock producers. I contributed significant effort to development and implementation of a farm animal care hotline and response team, together with Iowa Farm Bureau Federation and Dr. Suzanne T. Millman [Hartline], Ph.D., and Iowa Pork Producers Association. IFAC was modeled on similar programs in Ontario and Alberta, Canada, and was launched in Jan. 2013. Dr. Millman serves as Coordinator of the On-Farm Evaluation Teams, and is the primary

contact for the program with ISU. This program involves a hotline through which concerns about specific farm animal care cases may be brought forward and addressed confidentially through education of the caller about customary care practices and/or through contacting the animal owner. When appropriate, the owner is offered the voluntary On-Farm Evaluation service, led by an ISU animal welfare faculty and veterinary clinician with relevant species expertise. To date, most of the calls received by the I.F.A.C. Coordinator have been educational in nature. The on-farm evaluation team assesses the animals, facility and stockmanship, and provides recommendations for rectifying the existing issues of animal care, together with preventive measures for the owner to pursue with his/her veterinarian or agricultural extension agents to prevent recurrence with the next cohort of animals.

Cases received by I.F.A.C. 2013 to 2017 (provided by Mr. M. Telford).

Date	**Location**	**Type**	**Outcome**
2018	North central Iowa	Cattle	On farm evaluation/report
2017	North East Iowa	Swine	On farm evaluation/report
2017	Wisconsin	Swine	Outlined costs/no action taken
2017	Northern Iowa	Cattle	Area extension evaluation; no issues
2017	Central	Cattle & Sheep	On farm evaluation/report
2016	Northern	Cattle	On farm evaluation/report
2016	South Central Iowa	Pigs	Could not reach owner. IFAC encouraged the caller to call the local authorities.
2016	East Central Iowa	Pigs	Third party refused to identify themselves; case closed.
2015	Northwest Iowa	Cattle	Neglected cattle – turned over to law enforcement.
2015	South Central Iowa	Pigs	Three dead pigs left outside the barn. Called owner and pigs were removed the next day.
2015	South West Iowa	Cattle	Marginal care, could not reach owner and encouraged caller to contact law enforcement.
2015	South East Iowa	Cattle	Concern expressed by neighbor who had already contacted producer. Determined not to be a continuous issue – case closed.
2015	North East Iowa	Cattle	Concern expressed by neighbor who had already contacted producer. Producer was working with a veterinarian and ISU.
2015	Central Iowa	Cattle	Concern about marginal care. Farm was visited by ISU and determined not to be a problem as the producer was using rotational grazing and cattle had enough feed.
2014	North Central Iowa	Pigs	Call from integrator informing IFAC that they may get a call from a terminated employee. No call was received.
2014	East Central Iowa	Pigs	Call from former employee of an operation. IFAC contacted the owner and no issues were identified.
2014	East Central Iowa	Poultry	Neighbor called regrading chickens within the city limits. Referred caller to local city administration.

5. ***Iowa Pork Producer Association tent: Volunteer***. State Fair, Des Moines, IA. 2010-present. Iowa Industry Center and faculty supported by the Iowa Pork Producers provides their time to assist at the IPPA tent.
6. ***Johnsonville Sausage: Animal Well-being Committee***. 2017-present. A newly formed committee led by Mr. B. Peyer. Committee has yet to meet in person.
7. ***Livestock Research Innovation Corporation (LRIC).*** 2014-present. Responsibility of ensuring that the research funded by the livestock and poultry sectors that operate in the province of Ontario Canada are of the highest standard. Yearly the livestock and poultry sectors in Ontario contribute approximately $6 M in direct industry investment in research funding and leverage other funding of twice this value creating a valuable livestock and poultry research portfolio in the Province. Serve as a professional reviewer for the submitted proposals.
8. ***NCR-1029: Animal Behavior and Welfare.*** 10/01/2016 to 09/30/2021. The **long-term objective** of the NC-1029 project is to optimize animal welfare and productivity. In order to meet this long-term objective, we are proposing to provide sound science in the following two areas for the next five years of the NC-1029 project: (a) **to develop novel animal behavior measurement techniques and to evaluate animal behavior as an indicator of animal welfare.** There is a need to develop *novel*, preferably *non-invasive techniques* to measure animal behavior. Behavior can be used as an indicator of welfare, and can provide critical and timely information in regards to how an animal is coping, adapting or not coping to a prescribed set of circumstances and (b) **to improve our understanding of various aspects of on-farm welfare assessment and auditing programs such as sampling (including frequency of visits, number of animals/pens/cages monitored, and other aspects of methodology) and the appropriateness and feasibility of various on-farm measurements.** Many animal welfare assessment/certification and third-party auditing programs have been introduced in the U.S. in recent years, such as the Pork Quality Assurance-Plus (PQA Plus) for swine, United Egg Producers Certified for layer hens, and the National FARM program for dairy cattle. The work of the NC-1029 committee is crucial for the development and implementation of science-based programs. Commodity groups in the U.S. have highlighted that their policies and programs must be based on sound animal welfare science (e.g., National Pork Board, 2002; National Milk Producers Federation, 2009). The protocols for these two areas of research will be carried out at multiple institutions and the outcomes will elucidate the validity of measures across different environments and genotypes of farm animals.
9. ***One Health Certified***. 2020 to present (https://www.cfwru.iastate.edu/) Existing food labels are often confusing and narrowly focused. One Health Certified™ is a food animal certification program that recognizes that the health of humans, animals, and the environment are inseparable. This multi-protein label addresses important consumer concerns about how animals are raised and takes the guesswork out of food shopping for consumers. The One Health Certified™ food animal certification program provides transparent standards which create a comprehensive and sustainable animal care program for participating farmers to follow. Scientific research and experience drive updates to this evolving program to ensure best responsible animal care practices for today and tomorrow. Compliance with the program is verified by annual audits conducted by the United States Department of Agriculture Agricultural Marketing Service (USDA-AMS) Process Verified Program.
10. ***Pig Information Gateway (PIG):*** 2005 to present. (http://www.porkgateway.org/web/guest1/home). Animal behavior and well-being committee. Attend committee members and outline the areas that need to have useful information collated and presented for pork producers to use on their facilities.
11. ***Pig Information Gateway (PIG):*** 2005 to present. (http://www.porkgateway.org/web/guest1/home) Production and management committee. Attend committee members and outline the areas that need to have useful information collated and presented for pork producers to use on their facilities.
12. ***Pork Industry Animal Welfare Advisory Group.*** National Pork Producers Council (NPPC). 2008 to present. Committee member is to guide NPPC to provide scientific input in standards that can be used by any entity to conduct assessments/audits as deemed necessary. Help provide direction to the United

States Department of Agriculture through NPPC work on swine well-being throughout the entire pork chain. Furthermore, to help develop a comprehensive strategy to address animal welfare issues such as state ballot initiatives driven by animal rights organizations and legislation supported by these groups for the purpose of mandating animal care practices.

13. ***Professional Animal Auditor Certification Organization (PAACO):*** 2014 to present. As third-party animal welfare verification becomes the U.S. swine industry standard, resources are needed to effectively train knowledgeable, objective, independent and unbiased auditors. The Common Swine Industry Audit (C.S.I.A.) was developed by a task force of producers, veterinarians and packers in response to concerns about duplicative, costly and inefficiency associated with retailer-led animal welfare standards and certification programs. The new audit tool was built upon existing Pork Quality Assurance Plus and Trucker Quality Assurance programs to provide a single, common audit platform for the pork industry, pork suppliers, retailers and restaurants. Although animal welfare audits have been implemented at beef, pork and poultry slaughter facilities since the 1990s, the C.S.I.A. verifies swine husbandry and pork safety standards on farm. In 2014, Dr. Millman was invited to chair the C.S.I.A. curriculum development committee for the Professional Animal Auditor Certification Organization. Together with CSIA curriculum committee members from ISU (Dr. C Rademacher and I) and Ohio State University (Dr. M. Pairis-Garcia and Dr. S. Moeller), we created the CSIA curriculum and course materials in spring 2015, including powerpoint lectures, on-farm demonstrations and hands-on activities, case studies, pool of examination questions and syllabus. We delivered the course content to an invited cohort of potential auditors and instructors in a train-the-trainer course delivered at the University of Minnesota Southern Research and Outreach Center swine facility in Waseca, Minnesota, July 2015. During 2016, a revision phase of the C.S.I.A. curriculum occurred, and I continued to work closely with PAACO and the C.S.I.A. task force during the launch phases of the C.S.I.A. curriculum and program planned for fall 2016. I continue to serve this organization and national industry program as a member of the C.S.I.A. Curriculum Steering Committee and as an instructor.
14. ***Resource Coordination Center (RCC) to Assist Livestock Producers***. 2020-present. Iowa Secretary of Agriculture Mike Naig declared that the Iowa Department of Agriculture and Land Stewardship formed a Resource Coordination Center (RCC) to support Iowa livestock producers affected by the COVID-19 supply chain disruptions. COVID-19 outbreaks in the workforce are causing many meat processing facilities to run below normal operating capacity. That's creating challenges for producers who are trying to convert livestock to food products. The Department is collaborating with public and private partners to operate the RCC, including the Iowa Pork Producers Association, the Iowa Pork Industry Center, and ISU-University Extension. Through the RCC, livestock industry experts, state agencies and technical specialists will help producers explore every option to harvest livestock and meet the protein needs of Iowans. The RCC will also connect producers with technical resources as they work through difficult and emotional decisions, including animal welfare euthanasia and disposal. Iowa livestock producers can call the RCC at (515) 725-1005, Monday through Friday between 8 a.m.-4:30 p.m., or fill out a help form anytime at iowafarmerhelp.com. COVID-19 has caused supply chain disruptions that are forcing producers to make emotional and stressful decisions. If producers are feeling overwhelmed, they can call the Iowa Concern Hotline at 1-800-447-1985 to get free, confidential support, 24/7.
15. ***Spokesperson for the National Pork Board on Food safety, disease containment and impact on swine well-being.*** 2013-present. For more than 12 years, four livestock commodity organizations have been working together on preparation for managing a Foot-and-Mouth Disease outbreak. The American Sheep Industry Association, Dairy Management Inc., National Cattlemen's Beef Association, as a contractor to the national Beef Checkoff program, and National Pork Board joined efforts to create the Foot and mouth Disease Cross-Species Communications Team with the goal of preparing now to maintain consumer confidence and create a unified industry response in the event of an outbreak. An important part of that preparation is identifying credible spokespersons that can help carry key messages about food safety, the disease's containment and impact, animal well-being, and more to the consumer audience.

16. ***Spokesperson for the National Pork Board on Swine well-being.*** 2013-present. For more than 12 years, four livestock commodity organizations have been working together on preparation for managing a Foot-and-Mouth Disease outbreak. The American Sheep Industry Association, Dairy Management Inc., National Cattlemen's Beef Association, as a contractor to the national Beef Checkoff program, and National Pork Board joined efforts to create the Foot and mouth Disease) Cross-Species Communications Team with the goal of preparing now to maintain consumer confidence and create a unified industry response in the event of an outbreak. An important part of that preparation is identifying credible spokespersons that can help carry key messages about food safety, the disease's containment and impact, animal well-being, and more to the consumer audience.
17. ***Topigs Norsvin.*** 2021 to present. Topigs Norsvin is renowned for its innovative approach in implementing new technologies and its continuous focus on cost-efficient pig production. Our focus on innovative breeding means we achieve higher genetic progress each year. This creates extra added value and new possibilities for our partners. Our genetic improvement is based on two major cornerstones: sustainability and efficiency. In our words: balanced breeding and total feed efficiency. https://topigsnorsvin.us/
18. ***World Organization for Animal Health (OIE):*** 2005 to present. Serving United States Department of Agriculture for review of the sea, land transport, slaughter and mass euthanasia working guidelines. Information available at: http://www.oie.int/eng/en_index.htm

COMPLETED COMMITTEE SERVICE (N = 31)

1. ***American Dairy Society Association.*** 2007. Discover conference on sow longevity. Steering committee. First sow longevity conference held globally. Tasks were to identify speakers, raise sponsorship monies, and organize the agenda and to help advertise the meeting. A total of 120 people attended (maximum allowed). Countries represented were USA, Canada, UK, Ireland, Finland, Denmark, the Netherlands, Brazil and Chile.
2. ***American Humane Association.*** 2008 to 2011. American Humane Certified™ Scientific Advisory Committee. The only assistant professor to serve on the committee (all other member were full professors) Sole technical advisor for guidelines for swine standards (http://www.thehumanetouch.org/guideline_docs/2008PublicSwineStandardsGuidelines08-11-08.pdf) that will be used to grant farms American Humane Association Certified Free Farmed.
3. ***American Society Animal Sciences: Animal Behavior and Well-Being (National) committee.*** 2009 to 2010. Served in the capacity of Chair. As a committee member / chair I was actively involved in reviewing all abstracts that were submitted to the section (n = 105). I led the committee successfully and a euthanasia symposium was designed and hosted. I organized the agenda for both the poster and oral sessions respectively. The American Society of Animal Sciences (ASAS) committee worked alongside the American Dairy Science Association (ADSA) well-being committee.
4. ***American Society Animal Sciences: Animal Behavior and Well-Being (Mid-west) committee.*** 2006 to 2010. Served in the capacity of the committee Chair. 2007-2008; 2009-2010. As a committee member I was actively involved in reviewing all abstracts that were submitted to the section. As chair, I wrote a symposium and oral session concept titled "Swine well-being issues: How are they being addressed?" and the idea was accepted and in addition the committee were provide $1500 to bring in an outside speaker to the event. I was in charge of reviewing all other abstract submissions, garnering outside reviews, addressing concerns with the abstracts (n = 4) and organizing the overall agenda around the symposium. The symposium was held on Tuesday 18th March 2008, approximately 75 persons attended over the morning. Four **invited** speakers presented: J. N. Marchant-Forde, D. C. Lay, Jr., R. M. Marchant-Forde, E. A. Pajor, and H. W. Stress responses of piglets during routine processing procedures. A. K. Johnson and C. J. Jackson. Drinking behavior of seven-week-old pigs when water is either withheld or provided *ad libitum*. J. Woods. Active euthanasia and animal welfare and M. J. Ritter A review of transport losses in market weight pigs. In addition, I chaired the animal behavior and well-being poster session where 12 posters were displayed.

5. ***American Society Animal Science (ASAS): Animal Behavior and Well-Being (National) committee.*** 2006 to 2008. Served in the capacity as committee Chair 2007-2008. As a committee member / chair I was actively involved in reviewing all abstracts that were submitted to the section. As chair I was in charge of obtaining peer reviews completed on all submitted abstract and also organizing the agenda for both the poster and oral sessions respectively. The ASAS committee worked alongside the ADSA well-being committee to identify two centennial speakers to present at the National meeting; Dr. R. Strickland from the University of Maryland who did a reflection over the past and how ASAS has played a role in behavior and well-being and A. K. Johnson who was asked to present the future role of ASAS in the field of animal behavior and well-being.
6. ***American Association Swine Veterinarians (AASV):*** 2005 to 2007. (http://www.aasv.org/). The AASV is an organization that represents 1225 swine veterinarians of which 770 are located in the U.S. and is the official organization for pig veterinarians. Task force on third party auditing. Committee member to serve as an expert to the AASV on what third party audits were on the market or being worked on, audit content, timelines and how companies were implementing them on farm and at the packing plants. The committee disbanded when ASSV began working closely with the National Pork Boards Animal Welfare Committee.
7. ***Animal Agriculture Alliance (AAA).*** 2005 to 2006 (http://www.animalagalliance.org/main/home.cfm?Section=Main&Category=Home) *Animal Welfare and Food Production*. Third-party subject matter experts. Aim of AAA is to improve communications among farmers, ranchers, processors, food retailers and consumers, helping people better understand the role animal agriculture plays in providing a safe, abundant food supply to a hungry world. Monthly conference calls to identify what activist groups were currently involved in; campaigns, message points, legislation etc., and then to provide guidance the AAA to work on. AAA has 500 clients including individuals (veterinarians, animal scientists, producers, crop farmers, sales and marketing individuals, etc.), associations (local, state, national & international), government officials, as well as private/public businesses across all sectors of the feed & food chain (animal health & nutrition, feed, biotech, producers, processors, retailers, food distribution, etc.).
8. ***Animal Welfare Committee:*** National Pork Board. 2005 to 2014 (www.pork.org). Committee member whose role was to provide scientific advice for the creation of educational programs; PQA Plus, On farm euthanasia of swine – recommendations for producers, fact sheets and the swine care handbook for the U.S. pork producer.
9. ***Animal Welfare Committee:*** National Pork Board. 2014 to 2019 (www.pork.org). Committee advisor whose role was to was to provide scientific advice for the creation of educational programs; PQA Plus, On farm euthanasia of swine – recommendations for producers, fact sheets and the swine care handbook for the U.S. pork producer. The National Pork Board in 2019 decided to move to a different business model and all committees were disbanded.
10. ***Council for Agricultural Science and Technology (CAST).*** 2013 to 2018. CAST Taskforce Report on Animal Welfare. Co-chaired by Dr. C. Croney (Associate Professor of Animal Sciences, Purdue University) and Dr. William Muir (Laying Hen Ethologist/Geneticist/Management Scientist, Purdue University). The goals and objectives of this report were to examine the most current scientific information regarding the following (1) An update of the 1997 CAST Report 130 The well- being of agricultural animals with the new knowledge and information (2) ethical and moral differences and similarities (see page 10 in 1997 report) between the animal rights and animal welfare and humane treatment philosophical arguments and how to bridge such differences (3) how agricultural animals should be strictly scientifically assessed with respect to behavioral/cognitive, functional/structural, health, and productive/reproductive performance indicators of state of being, and the pros and cons of certification programs in assuring such criteria and (4) how food production, land use, food processing, and food distribution economics should not necessarily dictate but should certainly inform the process of and be taken into account when determining contemporary animal production procedures, systems, and technology (5) how ethical considerations should be accommodated during the process of determining contemporary animal production procedures, systems, and technology (6) how best to

motivate implementation of currently accepted animal welfare best practices (7) the potential short and long term impacts on individual farms as well as entire industries if animal welfare related laws or de facto regulations repeatedly change. A CAST Task Force Report was written by a volunteer task force composed of a multidisciplinary team of scientists and subject matter experts who were identified as part of the proposal development process. The qualified scientists edited and peer reviewed the report to ensure balance and scientific credibility. A one-page executive summary (the Ag quickCAST) was written and released simultaneously with the report. Specifically, Dr. Johnson wrote the sow housing section, and edited the entire report.

11. ***Farm Foundation: Animal Welfare Committee.*** 2005 to 2006. (http://www.farmfoundation.org/) Farm Foundation serves as a catalyst for sound public policy by providing objective information to foster deeper understanding of issues shaping the future for agriculture, food systems and rural regions. Farm Foundation does not lobby or advocate. In has a 75-year reputation for objectivity allows us to bring together diverse stakeholders for discussions on issues and public policies. The Foundation addresses issues significant across the face of agriculture and rural America, regardless of geographic, livestock or crop boundaries. Farm Foundation initiates dialogue on timely and evolving issues, bringing all stakeholders together for productive discussions and providing comprehensive, objective information for business and public policy decision makers in agriculture, the food system and rural regions. This committee was involved in reviewing scientific literature, writing an animal welfare chapter and finalizing the content. Full and final report can be located on http://www.farmfoundation.org/news/templates/widetemplate.aspx?articleid=1098
12. ***Federation of Animal Science Societies (FASS).*** 2005 to 2006. https://secure.fass.org/publications/order_form1.asp. Committee member for the swine Level I and II training. Chaired by Professor John McGlone. This was the first species-specific educational module to accompany the Farm Animal Worker Training Program and was made available from the Federation of Animal Science Societies. The Swine Training Level 1 contained a video production (CD-ROM and VHS cassette) by FASS addressing general principles of swine care and use. Space and temperature charts for display at the facility, a PowerPoint presentation (Pig Overview) on CD-ROM. (Speaker notes included) the National Pork Board Video Series, Video 3: "Swine Handling for Pork Producers" Reproducible certificate of completion, a spiral-bound, four-color publication of more than 40 slides from the PowerPoint file and sample test questions and answers.
13. ***Federation of Animal Science Societies (FASS):*** 2007 to 2010. (http://www.fass.org/index.asp). Committee member for revising Chapter 10 of the Guide for the care and use of agricultural animal in agricultural research and teaching. Titled Guidelines for swine husbandry. Chair was Dr. Janeen Salak-Johnson. This is the guide that all research across the U.S. must refer to and that the Institutional Animal Care and Use Committees refer to when research proposals are submitted by scientists.
14. ***Future Trends in Animal Agriculture (FTAA):*** USDA-ARS. 2005 to 2007. The FTAA is made up of commodity groups, animal advocacy organizations, consumer representatives, government personnel, and others. The role of the committee was to help with the content and theme of the agenda (annually) and to be responsible in notifying and organizing one speaker to attend the conference. The meeting was held at the United States Department of Agriculture in Washington D.C. in 2005, the meeting focused on Proceedings: Certification and Education Programs: Current Status of Farm Animal Welfare, in 2006, Addressing International Trade Complexities of Animal Welfare and in 2007, Food Animal Agriculture in 2020. Approximately 200 persons would attend and the attendance came from government, commodity, private business, humane and animal rights groups.
15. ***Animal Well-Being Committee. Sub Committee of the Swine Health Committee. Iowa Pork Producers Association (IPPA).*** 2013-2020. This committee advises on state swine well-being issues. Current projects include moving non-ambulatory pigs at marketing and fitness to transport. The IPPA Animal Well-being committee serves an important swine producing state. According to the 2017 *Iowa Pork Industry Report, the swine industry contributed $36.7 billion in sales with $12.2 billion in added value beyond the cost of inputs ($24.5 billion), $8.3 billion in labor income, 141,813 jobs, $0.76 billion in state and local taxes and $1.56 billion in federal taxes*. Of the $36.7 billion in sales from pig

production and related economic activity: pig production contributed $13.1 billion, slaughtering $18.3 billion and processing $5.4 billion.

16. ***International Meat Animal Welfare Research Conference (IMAWRC):*** 2005 to 2007. American Meats Institute (AMI): Task force on creating a one-day symposium on animal well-being issues that directly affect the U.S. packing industry. Experts in the field of animal handling and stunning presented their latest research findings to the audience that consisted of all the large packing plants (Cargill, Smithfield, Tyson, Swift and Hormel; 90% of the packing plant industry).
17. ***International Organization for Standards. ISO.*** 2012 to 2016. US TAG to ISO/TC 34/WG16 Animal Welfare. Asked to represent the U.S. Pork Industry. First plenary session on 23rd October 2012 was held in Paris to start the development of global standards for animal welfare. The standards were completed and published in November 2016.
18. ***International Society for Applied Ethology (ISAE).*** 2009 to 2011. Dr. Jeremy Marchant-Forde served as chair for the organizational committee. In July 2011, the 45th International conference for ISAE was held in Indianapolis. In 2008, the meeting was held Cain's Australia. A total of 236 people from 102 countries registered for the meeting and 59% of them gave presentations.
19. ***Sow Longevity Committee:*** National Pork Board. 2005 to 2010. As a committee member I was involved in reviewing the scientific literature, to help write fact sheets, programs and policy statements on sow longevity issues for the National Pork Board.
20. ***WERA-204.*** Agricultural Bioethics. 2006 to 2008. Multi state committee that was actively involved in holding symposiums and oral / poster presentations at the National American Society of Animal Science meetings. As a committee member I was involved in identifying issues, agendas, speakers and helping review the submitted abstracts.
21. ***Swine Health / Animal Well Being Committee.*** Iowa Pork Producers Association (IPPA). 2008 to 2013. Newly formed committee in 2008. Committee member role was to provide scientific advice on welfare issues at the state level. In 2008, IPPA **invited** me and seven others to visit Denmark and review the free access stalls for sows with the intention of holding educational seminar at their January 2009 meeting. The IPPA Animal Well-being committee serves an important swine producing state. The February 2008 USDA report indicates that there are 8500 operations (36,129,336 market hogs; 482,455 feeder pigs; and 23,395 seed stock were checked off in Iowa with a gross market value of ***$4,679,611,661***with hogs in Iowa). Iowa pork industry: creates more than 63,000 jobs, contributes more than ***$2 billion*** in annual payroll, and contributes ***$12 billion*** annually in economic impact to the State of Iowa (Iowa State University's Department of Economics).
22. ***NCR-1029: Animal Behavior and Welfare.*** 2005 to 2010. Multi state committee that was actively involved in validating "fear" tests for swine, goats, sheep, beef, dairy and poultry. Three tests were compared; novel-approach, avoidance and startle testing. Iowa State University in the summer of 2008 completed the swine portion.
23. ***NCCC-209: Agricultural bioethics multi-state research committee.*** 2009 to 2011. Animal scientists have contributed greatly to the abundant and readily available food supply that most Americans now enjoy. However, the mechanical and chemical technologies that were employed to increase animal production levels and lessen human labor have also brought forth questions related to the appropriateness of the restrictions on animal behavior and the lessening of animal lifespan associated with the high levels of growth rate, egg and milk production, etc. These questions arise within a world where social structures are changing rapidly. There is an undoubtedly mistaken belief that all scientists typically view science as a value-free enterprise, and therefore, give little attention to the ethical implications of their work. Nevertheless, science is a social practice that supports cultural agendas. These in turn determine socio-political structures that influence that has access to goods, services, liberties, and power. To address these concerns this committee is working on the following projects: (1) create a forum in which contentious issues in animal science and agriculture may be vigorously debated (2) increase the number of undergraduate and graduate courses that deal with the ethics of animal sciences and animal agriculture, (3) create "renewed attention to the philosophy of science within the animal agriculture and veterinary disciplines", (4) sponsor workshops / symposia which

would "cover the basic patterns of argument used to justify an action in light of its consequences, in light of claims of right, consent and respect...." and (5) establish a new regional project on agricultural bioethics to encourage the development of active interdisciplinary research projects and outreach programs.

24. ***American Society of Animal Sciences. Early Career Achievement Award committee***. 2012 to 2014. As a past recipient of the award, the role was to serve for one year on the committee. In this role, potential applications are reviewed. During this review, a matrix was created listing the candidate's strengths and weakness. Each reviewer's comments were sent to the committee chair whom ranked the information and selected the award recipient.
25. ***ARS National Program 101: Animal Production Retrospective Review.*** 2015 to 2015. The full committee consisted of: Janice Boarman (Chair), Chris Ashwell, Bauck Stewart, Jeffery Firkins, Rodney Geisert, David Gerrard, Kim Vonnahme and Anna Johnson. Early 2015 the committee members were sent all the programs that fit under the 101 program. Specifically, I reviewed the farm animal well-being program that covered Indiana, Texas and Tennessee and dairy, poultry, beef and swine. The charge was to assess the past, current and future direction of the programs, to determine if the work was novel and not overlapping with other segments of the government or industry and to rank how productive the centers were. On March 1st 2015, a full day conference call was held where the committee heard from 21 USDA-ARS staff members. The committee was able at this time to ask questions to clarify things reviewed prior to the conference call or to clarify information presented on the conference call. A final report was written by the committee and submitted to the ARS National Program staff.
26. ***Master Pork Partner***. Iowa Pork Producers Association. 2019 to 2019. award aims to *recognize production company employees* who have demonstrated *positive impacts on their production system* but who are not involved in day-to-day, on-farm duties and management. https://www.iowapork.org/producer-resources/master-pork-producer-nominations/ Asked to review five nominations and send responses back to MS. J. Eggers. Production Education Director.
27. ***United States Department of Agriculture -National Institute of Food and Agricultural***. 2019 to 2020. Chair of the review panel for the Agriculture and Food Research Initiative (AFRI) Welfare and Well-being of Agricultural Animals program. Role was to identify and recruit the panel. Ten persons served on the panel. Reviewed the submitted abstracts (n = 29), helped assign proposals to reviewers. Assisted with questions. Attended the virtual panel January 6th – January 10th 2020, Kansas City, Kansas. Completed a summary report at the conclusion of the process.
28. ***Taskforce on proper animal handling and willful acts of abuse***. 2019 to 2020. Taskforce member. To create training modules that explain proper pig handling and what acts of willful acts of abuse could occur in handling. The focus of these training modules is for handlers and producers to recognize "grey areas." Other members Dr. J. Johnson, USDA-ARS, Dr. M. Benjamin, Michigan State University and Dr. A. DeDecker, Smithfield One.
29. ***National Pork Board***. 2021. Task Force on Mass Euthanasia and Depopulation. Reviewed three proposals and provided scientific guidance and additional animal-based measures to measure welfare. Ms. S. Wisdom was the lead. Committee members Dr. C. Rademacher. Dr. R. Woiwode and Dr. D. Lay.
30. ***Animal Well-Being Committee. Sub Committee of the Swine Health Committee. Iowa Pork Producers Association (IPPA).*** 2020-to 2021. This committee advises on state swine well-being issues. Current projects include moving non-ambulatory pigs at marketing and fitness to transport. The IPPA Animal Well-being committee serves an important swine producing state. According to the 2017 *Iowa Pork Industry Report, the swine industry contributed $36.7 billion in sales with $12.2 billion in added value beyond the cost of inputs ($24.5 billion), $8.3 billion in labor income, 141,813 jobs, $0.76 billion in state and local taxes and $1.56 billion in federal taxes*. Of the $36.7 billion in sales from pig production and related economic activity: pig production contributed $13.1 billion, slaughtering $18.3 billion and processing $5.4 billion.

31. ***Pig welfare symposium.*** 2015 to present. Steering committee member. Chaired by Ms. S. Webb (Director Swine Welfare at the National Pork Board 2015-2017 and Vice President of Swine Welfare at the National Pork Board Dr. S. Crawford 2017 to present). Steering committee comprised of Dr. A. Baysinger (Merck), Dr. C. Goldhawk (Elanco), Dr. D. Hockman (NPPC), Dr. G. Almond (NCSUS), Dr. J. Brown (Prairie Swine Center), Dr. J. Marchant-Forde (USDA-ARS), Dr. J. Haala (Christensen Farms), Dr. L. Mack (American Humane), Ms. L. Jones, (JBS), Dr. S. Millman (ISU), Mr. P. Ayers (Maschoffs), Dr. S. Moeller OSU), Dr. M. Pairis-Garcia (OSU) and Dr. Y. Li (UMN). Role has been to create the scientific program, review abstracts and to help host the symposium November 2017. Details available at: http://www.pork.org/pig-welfare-symposium/ For the November 7 to 9th 2017 meeting, 249 persons attended. Of this 23% were producers, 27% academia, 12% packer/processor, 23% allied industry, 2% media, 9% veterinarians, 1% retail/foodservice and 3% other (defined as World Animal Protection, Preferred Capital Management, Animal Welfare Institute, 3M and the America Society for the Prevention of Cruelty to Animals). A total of 31 virtual attendees were present. I chaired the lameness breakout session on Wednesday November 8th 9:30 am to 11:30 am. Four speakers presented: Mr. J. Stock, Ph.D. student, Department of Animal Science, Iowa State University "Selecting for feet and leg traits that reduce lameness occurrence". Dr. A. Forseth, Swine Medicine Education Center, Post-Doctoral, Iowa State University "Validation of a lameness diagnostic manual for naturally-occurring sow lameness". Dr. M. Campler, Post-Doctoral, Department of Animal Science The Ohio State University "Do rubber mats in farrowing help lame sows?" and Dr. L. Connor, Professor Department of Animal Science, University of Manitoba "Sow lameness in different housing systems": What factors should we consider?"

32. ***Euthanasia review panel***. National Pork Board. 2021.

DEPARTMENTAL & INSTITUTIONAL SERVICE (N = 42)

On-going (N = 3)

1. ***College of Agriculture Honors Committee***. ***College of Agriculture and Life Sciences***. 2013 to present. Chaired by Dr. Cunnick. Monthly meetings to work on students updated POS, review honor proposals and reports and attend the honors poster fair to critique the work.
2. ***Awards, Recognition and Employee Appreciation. Department of Animal Science***. 2021. Additional committee members: D. Beitz (Chair), J. Dekkers, D. Loy, J. Sebranek, C. Youngs, S. Lamont, M. Wenger, J. Selsby, J. Ross, A. Keating, A. Johnson, L. Bobeck, S. Lonergan, M. Lytle
3. ***Promotion and Tenure Committee: Department of Animal Science***. 2021. Additional committee members: D. Loy (Chair), E. Lonergan, S. Lamont, C. Morris, N. Gabler, J. Sterle, J. Sebranek and J. Reecy.
4. ***Professional Development Committee: College of Agriculture and Life Sciences and Iowa State University.*** 2017 to present. *Purpose*: The Professional Development Committee is responsible for facilitating the professional growth of faculty, professional and scientific employees, staff and administrators. This involves evaluating proposals or nominations for various professional development grants and awards, assessing professional development needs, and developing and overseeing programs to meet those needs. For example, this committee reviews and ranks Foreign Travel grant applications that are then forwarded to the Faculty Senate Committee on Faculty Recognition and Development. *Committee composition and operations*: Faculty members are appointed by the Dean or the Dean's designee in consultation with department Chairs and the Professional Development Committee Chair. Four faculty and one student are voting members. The term of faculty membership is three years with approximately one-third of the committee rotating off each year. No more than two consecutive terms may be served. The student member is appointed to a 1-year term that may be renewed. The committee members elect the Chair. The Chair or his/her designee represents the committee on the Faculty Senate Committee on Faculty Recognition and Development. Members: Anna Johnson, Animal Science (Chair). Cynthia Haynes, Horticulture, Donald Lewis, Entomology, Jan Thompson, Natural Resource Ecology & Management and Ebby Luvaga, Economics. https://www.cals.iastate.edu/committees/professionaldevelopment

Completed (N = 40)

1. ***Search Committee:*** Lush Endowed Chair in Animal Breeding and Genetics. Chaired by Dr. J. Dekkers. Co-committee members Drs. S. Lamont, N. Serao, A. Wolc, D. Loy and J. Yu. CALS canceled the search. Spring 2021.
2. ***Promotion and Tenure Evaluation Committee 3-year review:*** Dr. M. Rossoni Serão. Chaired by Dr. A. Johnson. S. Hansen. Co-committee members Drs. E. Huff-Lonergan, B. Skaar, J. Selsby and, J. Sterle. 2021.
3. ***Peer Review of Teaching***. Dr. S. Schmitz-Esser. Spring 2021. MICRO 440: Section 1. Department of Animal Science, Iowa State University.
4. ***Creating Inclusive Spaces Committee***. 2021. Chaired by Dr. S. Lamont, Equirty Advisor. *Creating Inclusive Spaces.* Assessment of Physical Environments in CALS Departments in Support of Diversity, Equity and Inclusion. This assessment process is conducted by Dr. Susan J. Lamont, CALS Equity Advisor, with valuable input into the assessment tool content and assessment process by Dr. Anna Johnson (Animal Science) and Dr. Julie Irish (Interior Design). The goal of the assessment is to support departments in their management decisions toward continual enhancement of diversity, equity and inclusion for visitors, students, and employees in the physical environments of their departments. The output of each assessment is a report provided to the department for their use in achieving their departmental goals. The report is made after a walk-through assessment of public spaces in the department and will include a summary of existing positives, as well as suggestions for changes. January / February 2021.
5. ***Diversity, Equity and Inclusion (DEI)***. 2020 to 2020. Chaired by Dr. S. Lamont. Co-Committee members Drs. J. Bundy, J. Dixson, E. Bobeck, and Ms. J. Paxton. Report given to Chair: Dr. D. Thomson and presented to full faculty 8th March 2021.
6. ***Search Committee:*** Lush Endowed Chair in Animal Breeding and Genetics. Chaired by Dr. J. Dekkers. Co-committee members Drs. S. Lamont, N. Serao, A. Wolc, D. Loy and J. Yu. Position was offered but the candidate declined and the position was closed. Fall 2016.
7. ***Social / Communications***. 2007 to 2020. Department of Animal Science, Iowa State University. Committee member role is to help with and implementing ideas where faculty staff and students can co mingle, one annual event is the Christmas party.
8. ***ISUADVANCE. Iowa State University. Advancing from Associate Professor to Professor: A two-part workshop series***. 2020. Panel discussion. Additional committee members V. Salotti, Associate Dean, S. Sundarajan Associate Dean and M. H. Greenlee, Professor. November 4th 2020. Ames, Iowa.
9. ***Affiliate faculty status in the Department of Animal Science***. Dr. L. Sadler. Sponsored by Dr. E. Bobeck. Chair Dr. S. Lamont. Committee members Dr. A. Johnson and Dr. D. Koltes. Faculty voted in support.
10. ***Promotion and Tenure Evaluation Committee:*** Dr. E. Bobeck. Chaired by Dr. S. Hansen. Co-committee members Drs. S. Lamont, S. Stalder and N. Gabler. 2020.
11. ***Promotion and Tenure Evaluation Committee:*** Dr. S. Schmitz-Esser. Chaired by Dr. L. Baumguard. Co-committee members Drs. J. Dekkers, Dr. S. Lamont, Dr. J. Reecy. 2020.
12. ***Search Committee:*** Department Animal Science Chair. Dr. Daniel Thompson began summer 2020. Member. Chair: Professor M. Retallick. Also, on the committee: D. Beitz, J. C. Dekkers, A. Keating, S. Hansen, J. Bundy, L. Greiner, M. Rossoni-Serao, H. Ramirez-Ramirez, M. Ruble, M. Wegner, D. Acker, J. Chinchilla-Vargas, G. Irwin, C. Fryer, J. Reecy, G. Dirusso, M. Monson, M. Paustian, P. McGonegle and L. Karriker.
13. ***Promotion and Tenure Evaluation Committee:*** Dr. E. Bobeck three-year review preliminary evaluation committee for consideration to continue with her academic career with the Department of Animal Science at Iowa State University. 29th March 2019. Also, on the committee were Dr. N. Gabler (Chair), Dr. J. Dixon and Dr. S. Lamont.
14. ***Post Tenure Review Committee:*** Dr. P. Auwerda. Chaired by Dr. J. Ross. Co-committee members Dr. Lamont, Dr. Huff-Lonergan and Dr. Selsby. 2019.

15. ***Promotion Evaluation Committee:*** Ms. N. Ferwerda. Chaired by Dr. A. Johnson. Co-committee members Dr. A. Keating, Dr. C. Youngs and Dr. N. Gabler. 2019.
16. ***Promotion Evaluation Committee:*** Dr. J. W. Ross. Chaired by Dr. C. Tuggle. Co-committee members Dr. J. Dixon, Dr. J. Patience, Dr. E. Huff-Lonergan. 2018.
17. ***Promotion Evaluation Committee:*** Mrs. N. Ferwerda. Chaired by Dr. A. Keating. Co-committee member Dr. N. Gabler. 2018.
18. ***Search Committee:*** Field Specialist II/III within the Department of Extension, Agriculture and Natural Resources Iowa State University Extension and Outreach and the Iowa Pork Industry Center. Miss Amanda Chipman began fall 2017.
19. ***Search Committee:*** Iowa Pork Industry Institute (IPIC) Director position. Dr. Jason Ross began September 1, 2016.
20. ***Search Committee:*** Field Specialist II/III within the Department of Extension, Agriculture and Natural Resources Iowa State University Extension and Outreach and the Iowa Pork Industry Center. Mr. Erik Potter began fall 2016.
21. ***Stakeholders Committee for Animal Health and Welfare for Research***. 2011. Wrote outcomes, assumptions and action items and findings were presented back to external advisory committee in 2011.
22. ***Seminar Committee***: 2014-2015. Committee member. Help to identify speakers for the seminar sessions. Chaired by Dr. C. Tuggle.
23. ***Search Committee: Assistant/Associate Professor Animal Physiology***. Co-chaired the committee with Dr. J. Selsby. Committee members: J. Sterle, J. Bundy and A. Keating. The search was considered a failed search, fall 2016 by Dean Winterstein.
24. ***Search Committee:*** Field Specialist II/III within the Department of Extension, Agriculture and Natural Resources Iowa State University Extension and Outreach and the Iowa Pork Industry Center. Position was offered but the candidate declined and the position was closed. Fall 2016.
25. ***Search Committee: Teaching coordinator***. Animal Science. Tenure Track 12-month appointment. Dr. J. Sterle began August 2011.
26. ***Section leader: Physiology***. 2011 to 2014. Monthly meetings were held between the section and the Department Chair. A cy-box was created that stores all documents of relevance for this section.
27. ***Special Committee***: 2012. Drs Lamont, Baumgard, Butters-Johnson and Sebranek reviewed space allocation for the Department of Animal Science. A report was presented back to Dr. Hogberg for his review. One report was for the faculty to review and vote on immediately. The secondary report was for Dr. Hogberg's use and implement.
28. ***Promotion and Tenure Evaluation Committee***: Dr. P. Gunn's three-year review preliminary evaluation committee for consideration to continue with his academic career with the Department of Animal Science at Iowa State University. 2015. Co-committee members were Drs. D. Loy, D. Morrical, J. Russell, and J. Reecy (chair).
29. ***Promotion and Tenure Evaluation Committee***: Dr. N. Gabler. Chaired by Dr. D. Beitz. Co-committee members Drs. S. Lonergan, Dekkers, Butters-Johnson and Reecy. 2012.
30. ***Promotion and Tenure Evaluation Committee:*** Chaired Dr. A. Keating's three-year review preliminary evaluation committee for consideration to continue with her academic career with the Department of Animal Science at Iowa State University. 27th March 2013. Also, on the committee were Dr. S. Carpenter, H. Harris, S. Lonergan and C. Youngs.
31. ***Promotion and Tenure Evaluation Committee:*** Dr. S. Hanson. Chaired by Dr. D. Garrick. Co-committee members Drs E. Huff-Lonergan, J. Patience and J. Russell. 2013.
32. ***Position Description Committee:*** **Assistant/Associate Professor in Animal Science.** 12-month tenure-track Assistant/Associate Professor position with 50% responsibilities in teaching, 25% in applied research and 25% extension/outreach. Serving with Dr. Dekkers (Chair), Drs Beermann, Patience, Stalder and Mr. G. Krahn.
33. ***Peer Review of Teaching***. 2011 to 2012. Department of Animal Science, Iowa State University. Committee member role is to help with a white paper detailing how the department and incorporate a

peer review of teaching document into the promotion and tenure portfolio and to assist associate and full professors with continued teaching improvements.

34. ***Department of Animal Science Graduate Student Excellence Award***. 2015. The purpose of this award is to recognize outstanding achievements and exceptional performance in two or more of the teaching, research and outreach activities that support the mission discovery, development and dissemination of knowledge of basic animal biology, applied animal science, and animal products of the Department of Animal Science. Reviewed 6 applications. Winner was Ms. Angelica Van Goor.
35. ***Undergraduate Curriculum***. Department of Animal Science, Iowa State University. 2010-2012. The primary responsibility and charge of the undergraduate curriculum committee is to review and make recommendations on curriculum and courses in the department. Any issues that deal with undergraduate teaching will flow through this committee including determining outcomes for courses and assessing whether the outcomes are being met.
36. ***Swine teaching and research facilities.*** 2021 to 2021. Additional committee members: Drs. L. Greiner (Teaching Coordination), N. Gabler (Research Coordination), K. Stalder and J. Ross.
37. ***Faculty Governance Committee: Department of Animal Science***. 2020 to 2021. Committee member role is to review the faculty handbook and internal polices Additional committee members: Drs. K. Stalder (chair), J. Dekkers, D. Loy, C. Tuggle, and J. Selsby.
38. ***Animal Science Major.*** Iowa State University. 2010 to 2021. Committee member role is to identify (1) if the major is still relevant and useful (2) qualifications for students entering the MS and Ph.D. programs (3) role of the major professor for admitting students into the major and (4) required classes for the MS and PhD levels.
39. ***Graduate Affairs Committee.*** 2018 to 2021. Additional committee members: Dr. N. Gabler chair), A. Keating, N. Serao, K. Stalder, R. Tarte, Rose Mary Ross (Staff) Amy Petry (graduate student). The Graduate Affairs Committee is responsible for reviewing all graduate applications for the Department of Animal Science. I serve as one of the representatives for the physiology section.
40. ***Internal Advisory Board: Department of Animal Science***. 2020 to 2021. Committee member role is to provide guidance and advise to the Department chair on making the Department stronger, more efficient and to work towards being the global Animal Science Department. Additional committee members: D. Thomson (chair), J. Ross, T. Houser, J. Sterle, J. Bundy, N. Gabler, J. Dekkers, L. Baumguard and C. Walker.

PAST CLUBS (N = 1)

1. ***Nutrition and Behavior club***. 2017-2021. Co-advisor with Dr. S. Hansen. This up and coming club provides a connection for students with the shared interest of animal nutrition and behavior. It is our goal that you can enhance your interest and make connections with other students like you as well people in the industry and graduate school. Information available at: https://www.stuorg.iastate.edu/site/2230/information

LEADERSHIP (N = 3)

1. ***Women and Philanthropy***. 2019. 20th Anniversary. The Power of Education. Tuesday 17 September, 2019, Ames, Iowa.
2. ***LEAD 21***. 2020 – 2021. LEAD21 is intended to meet the needs for leadership development of faculty, specialists, program and team leaders, research station and center directors, district and regional directors, department heads and chairs, and others in land grant universities' colleges of agricultural, environmental, and human sciences and National Institute of Food and Agriculture. Information available at: http://lead-21.org/
3. ***Cardinal Women***. 2021 – 2022. Total of 52 individuals were selected (out of 78) to participate in the fourth cohort of this personal and professional development program. Individuals represented the Presidents Division Student Affairs, Operations and Finance, Academic affairs, College of Agricultural and Life Sciences, Ivy College of Business, College of Design, College of Engineering, College of Human Sciences, College of Liberal Arts and Sciences, College of Veterinary Medicine, Library, Extension, and the Ames lab. The Cardinal Women program is a growth opportunity specifically for

women who are Iowa State University Faculty and Staff. Participants engage in discussions designed to foster leadership development, goal orientation and purpose in their personal and professional spheres. Since it began in 2018, Cardinal Women has impacted Iowa State University through the alumni from all areas of our organization who participate in the program. Tera Lawson and Dr. Denise Williams-Klotz, co-founders and co-directors of Cardinal Women, have worked to create a program that provides space for conversation, tools for development, and a community where ISU leaders can thrive. https://www.cardinalwomen.iastate.edu/