**Publications**

Baier, F.S., T. Grandin, T.E. Engle, S.L. Archibeque, J.J. Wagner, and L.N. Edwards-Callaway, 2020, Impact of liver abscess presence on stress related physiological parameters associated with well-being in feedlot cattle. Applied Animal Science, 36, 437-46.

Barnes TB, Cadaret C, Beede K, Schmidt TB, Petersen JL, Yates DT. 2019. Hypertrophic muscle growth and metabolic efficiency were impaired by chronic heat stress, improved by zilpaterol supplementation, and not affected by ractopamine supplementation in feedlot lambs. J Anim Scie. 97:4101-4113. 1093/jas/skz271

Beard JK, Mulliniks JT, Yates DT. 2019. Function and dysfunction of fatty acid mobilization: a review. Diabesity 5:1-5.

Beede KA, Limesand SW, Petersen JL, Yates DT. 2019. Real supermodels wear wool: summarizing the impact of the pregnant sheep as an animal model for adaptive fetal programming. Animal Frontiers. 9:34-43. 10.1093/af/vfz018.

Burrack RM, Duffy EM, Yates DT, Schmidt TB, Petersen JL. 2020. Whole blood transcriptome analysis in feedlot cattle after 35-days of supplementation with a β1-adrenergic agonist. J Applied Gen. 61:117-121. 10.1007/s13353-019-00527-6.

Cadaret CN, Merrick EM, Barnes TL, Beede KA, Posont RJ, Petersen JL, Yates DT. 2019. Sustained maternal inflammation during the early third trimester yields intrauterine growth restriction, impaired skeletal muscle glucose metabolism, and diminished β cell function in fetal sheep. J Anim Sci. 97:4822-4833. 10.1093/jas/skz321.

Casagrande, R.R., L. Alexander, L.N. Edwards-Callaway, Effects of gun model and number of stuns on stunning-related variables of cattle in a 1 commercial slaughter facility, Meat Science, Meat Science, 170, 108231.

Drwencke, A. M., G. Tresoldi, M. M. Stevens, V. Narayanan, A. V. Carrazco, F. M. Mitloehner, T. E. Pistochini, and C. B. Tucker. 2020. Innovative cooling strategies: Dairy cow responses and water and energy use. J. Dairy Sci. 103:5440-5454. 10.3168/jds.2019-17351.

Edwards-Callaway, L.N. and M. S. Calvo-Lorenzo, 2020, Board Invited Review: Animal welfare in the U.S. slaughter industry- A focus on fed cattle, Journal of Animal Science, 98, 1-21.

Jalali, S., K. D. Lippolis, J. K. Ahola, J. J. Wagner, J. W. Spears, D. Couch, and T. E. Engle. 2020. Influence of supplemental copper, manganese, and zinc source on reproduction, mineral status, and performance in a grazing beef cow-calf herd over a 2-year period. Appl. Anim. Sci. 36:745-753.

Kline, H.C., Z. D. Weller, T. Grandin, R. Algino, K. E. Belk, and L.N. Edwards-Callaway, 2020, Accuracy of visual evaluation of carcass bruise trim weight, Meat and Muscle Biology, 4, 1-6.

Kline, H.C., Z. Weller, T. Grandin, R. Algino, and L.N. Edwards-Callaway, 2020, From unloading to trimming: studying bruising in individual slaughter cattle, Translational Animal Science, 4: 1-9.

Li, Y. Z., L. J. Johnston, and M. S. Dawkins. 2020. Utilization of optical flow algorithms to monitor development of tail biting outbreaks in pigs. *Animals.* 2020, 10, 323/doi:10,3390/ani10020323.

Mijares, S., M. Davis, J. Ahola, L. Bigler, T. Engle, L. Alexander, and L.N. Edwards-Callaway, 2020, Development and validation of a mud scoring system for use in cattle at slaughter – A short communication, Meat Science, 172, 108354.

Moriel, P., Vedovatto, M., Palmer, E. A., Oliveira, R. A., Silva, H. M., Ranches, J., Vendramini, Joao M. B. 2020. Maternal supplementation of energy and protein, but not methionine hydroxy analog, enhanced postnatal growth and response to vaccination in Bos indicus-influenced beef offspring. J. Anim. Sci. 98(5).

Nilson SM, Workman AM, Sjeklocha D, Brodersen B, Grotelueschen DM, Petersen JL. 2020. Upregulation of the type I interferon pathway in feedlot cattle persistently infected with bovine viral diarrhea virus. Virus Res. 278:197862. 10.1016/j.virusres.2020.197862.

Ohlheiser, A.L., J.K. Ahola, F. S. Baier, R.J. Callan, A. S. Lear, S.R. Byers, and L.N. Edwards-Callaway, 2020, Oxytetracycline injection site reactions provide a model to assess nociception by pressure algometry and mitigation by flunixin meglumine in dairy cows, American Journal of Veterinary Research, 81, 471-8.

Posont RJ and Yates DT. 2019. Postnatal nutrient repartitioning due to adaptive developmental programming. Vet Clin Food Anim 35:277-88.

Swanson RM, Tait Jr RG, Galles RM, Duffy EM, Schmidt TB, Petersen JL, Yates DT. 2020. Heat stress-induced deficits in growth, metabolic efficiency, and cardiovascular function coincided with chronic systemic inflammation and hypercatecholaminemia in ractopamine-supplemented feedlot lambs. J Anim Sci. 98:skaa168. 10.1093/jas/skaa168.

Thorndyke, M. P., O Guimaraes, N. M. Tillquist, J. Zervoudakis, and T. E. Engle. 2020. Molybdenum exposure in drinking water or feed impacts apparent absorption of copper differently in beef cattle consuming a high forage diet. Biol. Trace Element Res. https://doi.org/10.1007/s12011-020-02440-0

Tresoldi, G., K. E. Schütz, and C. B. Tucker. 2020. Sampling strategy and measurement device affect vaginal temperature outcomes in lactating dairy cattle. J. Dairy Sci. 103:5414-5421. 10.3168/jds.2019-16667

Vander Poel, M., Collier, R., Renquist, B., Xiao, Y., Diaz, D.E. 2020. Evaluation of lactating Holstein cows during heat stress in response to a dietary feed additive in mid lactation. Journal of Dairy and Veterinary Sciences. 14(5), 2573-2196.

Walker, J., I.N. Roman-Muniz, and L.N. Edwards-Callaway, 2020, Timely Euthanasia in the United States Dairy Industry – Challenges and a Path Forward, Animals, 10, 71.

Weimer, SL, Mauromoustakos, A, Karcher, DM, and MA Erasmus. 2020. Differences in performance, body conformation, and welfare of conventional and slow-growing broiler chickens raised at 2 stocking densities. Poultry Science. 99:4398-4407. https://doi.org/10.1016/j.psj.2020.06.009

Weimer, S., R. Wideman, C. Scanes, A. Mauromoustakos, K. Christensen, and Y. Vizzier-Thaxton. 2020. Broiler stress responses to light intensity, flooring type, and leg weakness as assessed by heterophil-to-lymphocyte ratios, serum corticosterone, infrared thermography, and latency to lie. Poultry Science. 99:3301-3311. DOI: 10.1016/j.psj.2020.03.028.

Yates DT, Petersen JL, Schmidt TB, Cadaret CN, Barnes TB, Posont RJ, Beede KA. 2018. Fetal origins of impaired muscle growth and metabolic dysfunction: lessons from the heat-stressed pregnant ewe. J Animal Sci. 96:2987-3002. doi: 10.1093/jas/sky164.

Zanetti, D., L. A. Godoi, B, M. M. Estrada, T. E. Engle, M.V.C. Pacheco, J.M.V. Pereira, E. Detmann, M.F. Paulino, S.C. Valadares Filho. 2020. Influence of a mineral supplement containing calcium, phosphorus and micronutrients on intake, digestibility, performance and mineral status in young Nellore bulls in a Feedlot. Anim. Prod. Sci. 60: 277-287.

Zhu, Y., Y. Z. Li, M. Reese, E. Buchanan, J. Tallaksen, and L. J. Johnston. 2020. Behavior and performance of suckling piglets provided three supplemental heat sources. *Animals.* 2020, 10, 1155/doi:10.3390/ani10071155.

**Conference Abstracts/Other Presentations**

Edwards-Callaway, L.N., C. Cramer, I. N. Roman-Muniz, E. Calaba, L. Stallones, S. Thompson, S. Ennis, H. Simpson, E. Kim, and M. Pairis-Garcia, Preliminary exploration of swine veterinarian perspectives on euthanasia on-farm, Journal of Animal Science, Accepted May 2020.

Guimaraes, O., H. Y. Loh, M. P. Thorndyke, N. M. Tillquist, J. W. Spears†, and T. E. Engle. 2020. The influence of trace minerals source on copper, manganese, and zinc binding strength to rumen digesta in cattle fed high forage-based diet. J. Anim. Sci.

Guimaraes, O., H. Y. Loh, M. P. Thorndyke, N. M. Tillquist, J. W. Spears, and T. E. Engle. 2020. The influence of trace minerals source on copper, manganese, and zinc binding strength to rumen digesta in cattle fed a dairy-based diet. J. Anim. Sci.

Johnston, L. J. M. Reese, E. Buchanan, Y. Z. Li, A. M. Hilbrands, B. M. Lozinski, J. Tallaksen, K. A. Janni, B. Hetchler, and E. Cortus. 2020. Effects of a solar-powered cooling system on performance of heat-stressed lactating sows. American Society of Animal Science Midwest Section/ADSA Midwest Branch 2020 Joint Meeting. March 2-4, 2020. Omaha, Nebraska. Oral presentation.

Simpson, H., C. Cramer, L.N. Edwards-Callaway, L. Stallones, S. Thompson, S. Ennis, E. Kim, and I. N. Roman- Muniz. Mar 2020. Dairy worker perspectives on performing euthanasia as an essential component of their job. American Society of Animal Science Midwest Section/ADSA Midwest Branch 2020 Joint Meeting. Omaha, Nebraska

Simpson, H., L.N. Edwards-Callaway, C. Cramer, I.N. Roman-Muniz, L. Stallones, S. Thompson, S. Ennis, E. Kim, and M. Pairis-Garcia, Preliminary exploration of caretaker and manager perspectives of on-farm euthanasia on swine operations. American Society of Animal Science Midwest Section/ADSA Midwest Branch 2020 Joint Meeting. Omaha, Nebraska

Thorndyke, M. P, O. Guimaraes, N. M Tillquist, B. V. Tangredi, J. Zervoudakis, and T. E. Engle. 2020. The influence of long-term molybdenum supplementation (in drinking water or feed) on beef calf performance through weaning. American Society of Animal Science Midwest Section/ADSA Midwest Branch 2020 Joint Meeting. Omaha, Nebraska

Tillquist, N. M., M. P. Thorndyke, T.A. Thomas, S.J. Coleman, and T. E. Engle. 2020. Investigating the influence of copper supplementation on copper homeostatic genes in bovine liver. American Society of Animal Science Midwest Section/ADSA Midwest Branch 2020 Joint Meeting. Omaha, Nebraska

Gibbs R, Swanson RM, Beard J, Schmidt TB, Petersen JL, Yates DT. 2020. Deficits in growth, muscle mass, and body composition following intrauterine growth restriction persisted in lambs at 60 d of age but were improved by daily clenbuterol supplementation. Translational Animal Science. 4(S1):S53-57. doi.org/10.1093/tas/txaa097

Reith RR, Duffy EM, Swanson RM, Fuller AM, Schmidt TB, Yates DT, Petersen JL. 2020. Heat stress and β-adrenergic agonists alter the adipose transcriptome and fatty acid mobilization in ruminant livestock. Translational Animal Science. 4(S1):S141-144. doi.org/10.1093/tas/txaa122

Sieck RL, Treffer L, Ponte Viana M, Khalimonchuk O, Schmidt TS, Yates DT, Petersen JL. 2020. Beta-adrenergic agonists increase maximal output of oxidative phosphorylation in bovine satellite cells. Translational Animal Science. 4(S1):S94-97. doi.org/10.1093/tas/txaa112

Li, Y. Z. J. Zhu, M. Reese, E. Buchanan, and L. Johnston. Mar 2020. Effects of chilled drinking water and cooled floor pads on behavior of lactating sows under heat stress. American Society of Animal Science Midwest Section/ADSA Midwest Branch 2020 Joint Meeting. Omaha, Nebraska. Poster Presentation.

Li, Y. Z. Oct 2019. Parasite prevalence on organic pig farms. Swine Seminar UMN. 385J AnimSci/Vet Med. University of Minnesota. St Paul, MN.

Li, Y. Z. Oct 2019. Parasite prevalence on organic pig farms (Invited). Extension-in-Service Annual Meeting. National Pork Board. Sacramento, CA. Available at: <https://library.pork.org/web/212a26176db19407/2019-swine-education-in-service/>

Lou, M., Y. Z. Li, B. Ventura, and J. Deen. Mar 2020. Struggle behavior and vocalization of male piglets during castration. American Society of Animal Science Midwest Section/ADSA Midwest Branch 2020 Joint Meeting. Omaha, Nebraska. Oral presentation.

Engle T. July 2020. ASAS Ruminant Nutrition Symposium II. Presentation title: Effect of trace mineral source on rumen fermentation and trace mineral distribution in the rumen. Virtual Meeting.

Li, Y. Z., A. Hernandez, R. Carr, S. Major, and D. DeWitte. Mar 2020. Parasite prevalence and fecal egg counts on organic pig farms. American Society of Animal Science Midwest Section/ADSA Midwest Branch 2020 Joint Meeting. Omaha, Nebraska. Poster (PSVIII-21).

**Theses/Dissertations**

Guimaraes, O. 2020. MS. Trace mineral source impacts rumen trace mineral distribution and fiber digestion in steers fed a low-quality forage-based diet. Colorado State University

Lou, Maria. 2020. MS. The grimace scale as a method of acute pain assessment for neonatal livestock. University of Minnesota.

Nelsons, W. 2020. MS. Evaluation of ProPath for control of liver abscesses, pulmonary lesions, and heat stress of feedlot cattle managed under a natural feeding protocol. Colorado State University.

Rios-Lugardo, Andrea. 2020. MS. (Rendimiento productivo, características de la canal y cortes y calidad de carne de corderos alimentados con dietas isonitrogenadas con dos niveles de nutrientes digeribles totales). University of Puerto Rico

Swanson, R. 2020. MS. Heat stress-induced deficits in growth, metabolic efficiency, and cardiovascular function coincided with chronic systemic inflammation and hypercatecholaminemia in ractopamine-supplemented feedlot lambs; Atypical cyclicity at puberty in beef cows is associated with early deficits in muscling, metabolic indicators, and myoblast function in offspring but does not impact feedlot performance. University of Nebraska-Lincoln.

Throndyke, M. 2020. MS. Molybedenum exposure in drinking water vs feed affects copper apparent absorption differently in beef cattle consuming a high forage diet. Colorado State University.

Tillquist, N. 2020. MS, Investigating hepatic copper trafficking in beef cattle. Colorado State University.

**Extension Materials/Presentations**

DeWitte, D., Y. Z. Li, R. Carr, A. Hernandez, and S. Major. Mar 2020. UM organic swine research underway. Steven County Times. 2020 Farm Progress (B9).

Edwards-Callaway. 2020. Animal welfare during marketing: A dairy cow's journey from farm to plant, Dairy Cattle Welfare Council, webinar.

Edwards-Callaway. 2020. At-Risk Animals – Considerations, Dairy MAX, remote.

Edwards-Callaway. 2020. Consumer Expectations and the Evolving Science of Animal Welfare, National Cattlemen’s Beef Association Cattlemen’s College, San Antonio, TX.

Edwards-Callaway. 2020. Delivering Animal Well-being Outcomes, Global Roundtable for Sustainable Beef, webinar.

Edwards-Callaway. 2020. Evolving Science of Animal Welfare, Dairy MAX, remote.

Engle. Feb 2020. Larimer County Livestock Field Day. Presentation title: Got guts? Digestive Anatomy. Presentation and hands on dissection of gastrointestinal tracts of sheep. Larimer County Fair Grounds, Loveland, CO.

Engle. May 2020. Central and South America Consulting Ruminant Nutritionist Symposium, sponsored by Qualitech, Inc. Presentation title: The future challenges of research in beef cattle mineral nutrition. Virtual presentation.

Li, Y. Z. June 2020. Can camelina meal be used as a feed ingredient to reduce parasites in organic pig production? WCROC. Newsletter. Available at: <https://wcroc.cfans.umn.edu/wcroc-news/camelina-feed-ingredient>.

Snyder, A, Weimer, S. 2020. Understanding salmonella, its presence and control in live poultry. University of Maryland Extension Bulletin. FS-1137. https://extension.umd.edu/learn/publications/understanding-salmonella-its-presence-and-control-live-poultry

Tresoldi, G and Tucker, CB. 2020. The ups and downs of body temperature. Aug 25, 2020 issue of Hoard's Dairyman.

Weimer, SL. 2020. Animal welfare is the key to the sustainability of the poultry industry. University of Maryalnd Extension Bulletin. FS-1136. https://extension.umd.edu/learn/publications/animal-welfare-essential-sustainability-poultry-industry-program