

Dawn Koltes

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Professional Experience

Iowa State University (8/17-)

Adjunct Assistant Professor in Animal Science

- Investigating genetic and environmental factors that contribute to gastrointestinal health in poultry

University of Arkansas (7/15-7/17)

Research Scientist in Center of Excellence for Poultry Science

Adjunct Graduate Faculty in Animal Science

-Investigating factors that contribute to reduced gastrointestinal health in poultry and swine

Iowa State University (5/13-6/15)

Post-doctoral research assistant

-Characterizing porcine enteroids and characterizing pathways associated with increased intestinal permeability

-Characterizing the how lipids activate the immune system

Education

Iowa State University (1/09 – 5/13)

Doctorate of Philosophy in Genetics

Dissertation title: Novel mechanisms involved with lipid metabolism in adipose tissue of dairy cows

Advisor: Dr. Diane Spurlock

Iowa State University (8/06 – 12/08)

Master of Science in Animal Breeding and Genetics

Thesis title: The involvement of the novel proteins, perilipin, ATGL, and CGI-58, in lipolysis of early and mid-lactation Holstein cows

Advisor: Dr. Diane Spurlock

University of Arkansas (8/02 – 5/06)

Bachelor of Science in Animal Science with honors

Awards

Travel grant to attend Animal Bioethics Curriculum Conference. January 26-28th, 2017.

ASN Energy & Macronutrient RIS student-postdoc abstract award at Experimental Biology conference April 2013.

Midwest Young Dairy Scholar Award at ASAS/ADSA Midwest conference 2013.

Placed 3rd in the Master's Division of Oral presentation at ASAS/ADSA Midwest conference 2008

Referred Papers

V. Mani, J. Rubach, D. Sanders, T. Pham, D.A. Koltes, N. Gabler, M. Poss. Evaluation of the protective effects of zinc butyrate in IPEC-J2 cells and grower pigs under heat stress. *Translational Animal Science*, Volume 3, Issue 2, March 2019, Pages 842–854, <https://doi.org/10.1093/tas/txz023>

M.F. A. Baxter, S. Dridi, **D.A. Koltes**, J.D.Latorre, W.G. Bottje, E.S. Greene, S.W. Bickler, J.H. Kim, R. Merino-Guzman, X. Hernandez-Velasco, N.B. Anthony, B.M. Hargis, and G Tellez. Evaluation of intestinal permeability and liver bacterial translocation in two modern broilers and their Jungle fowl ancestors. *Front Genet.* 2019 May 21;10:480. doi: 10.3389/fgene.2019.00480. eCollection 2019.

J. E. Koltes, **D.A. Koltes**, B.E. Mote, J. Tucker, and D.S. Hubbel, III. Automated collection of heat stress data in livestock: new technologies and opportunities. *Translational Animal Science* 2(3): 319-323. doi: 10.1093/tas/txy061.

X. Sun, **D.A. Koltes**, C. N. Coon, K. Chen, and C. M. Owens. Instrumental compression force and meat attribute changes in woody broiler breast fillets during short-term storage. *Poult Sci* 2018 Jul 1;97(7):2600-2606. doi: 10.3382/ps/pey107.

M.F. A. Baxter, J.D.Latorre, **D.A. Koltes**, S. Dridi, E.S. Greene, S.W. Bickler, J.H. Kim, R. Merino-Guzman, X. Hernandez-Velasco, N.B. Anthony, W.G. Bottje, B.M. Hargis, and G Tellez. Assessment of a nutritional rehabilitation model in two modern broilers and their jungle fowl ancestor: a model for better understanding of childhood undernutrition. *Front Nutr.* 2018 Mar 23; 5:18. doi: 10.3389/fnut.2018.00018. eCollection 2018.

N. K. Gabler, **D. A. Koltes**, S. Schaumberger, R. Murugesan, and N. Reisinger. Diurnal heat stress reduces pig intestinal integrity and increases endotoxin translocation. *Translational Animal Science* 2(1): 1-10. doi: 10.1093/tas/txx003.

D. A. Koltes, H. Lester, M. Frost, D. Aldridge, K.D. Christensen, and C.G. Scanes. Effects of bacitracin methylene disalicylate and diet change on gastrointestinal integrity and endotoxin permeability in the duodenum of broiler chicken. *BMC ResearchNotes* 2017. DOI: 10.1186/s13104-017-2781-8

D. A. Koltes, M.E. Spurlock, and D. M. Spurlock. Adipose triglyceride lipase protein abundance and translocation to the lipid droplet increase during leptin induced lipolysis in bovine

adipocytes. *Domest Anim Endocrinol.* 2017 Oct; 61:62-76. doi: 10.1016/j.domaniend.2017.06.001.

D.A. Koltes and N. K. Gabler. 2016. Characterization of porcine intestinal enteroid cultures under a lipopolysaccharide challenge. *J. Animal Sci.* 94:335-339. Dio:10.257/jas2015-9793.

Li Y., Han D., Li J., **Koltes D.**, Deng X. 2015. A microarray study of altered gene expression during melanoblasts migration in normal pigmented White Leghorn and hyperpigmented mutant Silky Fowl. *Front. Agr. Sci. Eng.* 1:299-306

M.P. Faylon, **D. E. Koltes** and D. M. Spurlock. 2014. Regulation of lipid droplet-associated proteins following growth hormone administration and feed restriction in lactating Holstein cows. *J Dairy Sci.* May; 97(5):2847-2855.

D.A. Koltes and D.M. Spurlock. 2012. Adipose tissue angiopoietin-like protein 4 messenger RNA changes with altered energy balance in lactating Holstein cows. *Domest. Anim. Endocrinol.* Nov 43 (4) 307-16.

D. M. Spurlock, J. C. M. Dekkers, R. Fernando, **D. A. Koltes**, and A. Wolc. 2012. Genetic parameters for energy balance, gross efficiency, and related traits in Holstein cattle. *J Dairy Sci.* Sep;95(9):5393-402.

D.A. Koltes and D.M. Spurlock. 2011. Coordination of lipid droplet-associated proteins during the transition period of Holstein dairy cows. *J. Dairy Sci.* Apr 94(4):1839-48.

D. A. Elkins and D. M. Spurlock. 2009. Phosphorylation of perilipin is associated with indicators of lipolysis in Holstein cows. *Horm. Metab. Res.* 41:736-740.

Invited Talks

Effects of selection on nutrient utilization. 11th International Congress of Avian Specialists. Queretaro, Mexico. March 7-9, 2018.

Comparison of intestinal nutrient capacity of broiler and layer chickens. 10th International Congress of Avian Specialists. Queretaro, Mexico. March 7-9, 2017.

Effects of growth promoting antibiotics on duodenum health in broiler chickens. 10th International Congress of Avian Specialists. Queretaro, Mexico. March 7-9, 2017.

Understanding adaptation to physiological stress, environmental stress and genetics in livestock. Poultry Science Seminar. Fayetteville, AR, November 14, 2016.

Leptin increases adipose triglyceride lipase in bovine primary adipocytes. Experimental Biology Conference. Boston, MA. April 20-24, 2013.

Novel mechanisms involved with lipid metabolism in adipose tissue of dairy cows. ASAS/ADSA Midwest Conference. Des Moines, IA. March 11-13, 2013.

Abstracts

- M. Wiersema, L. Koester, S. Schmitz-Esser, and D. A. Koltes. Characterizing gastrointestinal microbial communities from laying hens housed in conventional and aviary housing types. PSA Annual Meeting. July 15-18, 2019.
- T. Bong, L. Reber, S. Orlowski, N. Anthony, S. Rochell, and **D. A. Koltes**. The impact of age and selection on intestinal morphology at 14 and 42 days of age in broilers and layers. PSA Annual Meeting. July 23-26, 2018.
- L. Reber, M.F.A. Baxter, B.M. Hargis, G. Tellez, and **D.A. Koltes**. Effects of a malabsorptive rye diet on growth and adipose tissue in commercial broilers. PSA Annual Meeting. July 23-26, 2018.
- L. Reber, M.F.A. Baxter, B.M. Hargis, G. Tellez, and **D.A. Koltes**. Effects of a malabsorptive rye diet on growth and adipose tissue in commercial broilers. International Poultry Scientific Forum. Jan. 28-30, 2018.
- L. Reber, M.F.A. Baxter, B.M. Hargis, G. Tellez, and **D.A. Koltes**. Effects of a malabsorptive rye diet on growth and adipose tissue in commercial broilers. Gut Health Symposium. November 13-15, 2017.
- C. Pender, G.R. Murugesan, **D. Koltes**. Effect of synbiotic supplementation on intestinal development and integrity of broilers. Gut Health Symposium. November 13-15, 2017.
- G. Tellez, M.F. Baxter, **D.A. Koltes**, S. Dridi. Metazoan Models and Nutrigenomics: The New Paradigm in Human Nutrition. Gut Health Symposium. November 13-15, 2017.
- S. Orlowski, N. Anthony, S. Rochell, **D. A. Koltes**. Changes in intestinal length and jejunal integrity between broiler and layer chickens. PSA Annual Meeting. July 16-21, 2017.
- C. Pender, G.R. Murugesan, **D. Koltes**. Effect of synbiotic supplementation on intestinal development and integrity of broilers. PSA Annual Meeting. July 16-21, 2017.
- B.A. Mallmann, K. Christensen, **D. Koltes**, S.L. Weimer, J. P. Caldas-Cueva, C. Coon, C. M. Owens. Impact of increased activity during rearing on incidence of woody breast in male broilers. PSA Annual Meeting. July 16-21, 2017.
- B.A. Mallmann, **D. Koltes**, A. Piekarski, J. P. Caldas-Cueva, K. Christensen, C. Coon, C. M. Owens. Use of manual palpation in live broilers to identify the onset of the woody breast myopathy. PSA Annual Meeting. July 16-21, 2017.
- J. P. Caldas-Cueva, X. Sun, S. J. Landis, **D. A. Koltes**, K. D. Christensen, and C. M. Owens. Use of image analysis to identify woody breast characteristics in broiler carcasses from 7 and 10 week old commercial broilers. PSA Annual Meeting. July 16-21, 2017.

- M.A. Sales T.C. Tsai, C.V. Maxwell, **D.A Koltes**. Decreased ileal permeability in piglets at weaning following exposure to irradiated topsoil. ASAS-CSAS Annual Meeting and Trade Show. July 8-12, 2017.
- M. A. Sales, T. C. Tsai, C. V. Maxwell, D. A. Koltes, and J. E. Koltes. MicroRNA discovery in peripheral blood mononuclear cells of topsoil-exposed piglets. ASAS-CSAS Annual Meeting and Trade Show. July 8-12, 2017. – Late Breaking Abstract
- T.C. Tsai, M.A. Sales, **D.A. Koltes**, C. Maxwell, and J.E. Koltes. Differential gene expression in peripheral mononuclear cells of pigs exposed to topsoil in early life. ASAS-CSAS Annual Meeting and Trade Show. July 8-12, 2017.
- S. Chewning, **D.A Koltes**, J. Powell, L.M. Meyer, J. Tucker, D. Hubble, and J.E. Koltes. Analysis of serial vaginal temperature measurements in crossbred beef cattle grazing novel or toxic fescue. ASAS-CSAS Annual Meeting and Trade Show. July 8-12, 2017.
- D. A. Koltes**, S. Chewning, L.M. Meyer, J. Powell, D. Hubble, J. Tucker, J.E. Koltes. In search of novel phenotypes and biomarkers associated with tall fescue and heat tolerance in crossbred beef cattle. Plant and Animal Genome. Jan. 14-18, 2017
- X. Sun, B. A. Mallmann, **D. A. Koltes**, K. D. Christensen and C. M. Owens. Using image measurements of broiler carcass to identify severity of woody breast online. International Poultry Scientific Forum. Jan. 31-Feb. 2, 2017
- K. Vignale, **D. Koltes**, J. Weil, S. West, S.L. Weimer, V. Iseri, K. D. Christensen. The effect of chromium propionate on performance responses in heat stressed male broiler chickens. International Poultry Scientific Forum. Jan. 31-Feb. 2, 2017
- K. Vignale, **D. Koltes**, J. Weil, S. West, S.L. Weimer, V. Iseri, K. D. Christensen. The effect of encapsulated butyric acid and zinc on performance and gut integrity in heat stressed male broiler chickens. International Poultry Scientific Forum. Jan. 31-Feb. 2, 2017
- C. Pender, R. Murugesan, **D. Koltes**. Effect of synbiotic supplementation on intestinal integrity of broilers. International Poultry Scientific Forum. Jan. 31-Feb. 2, 2017
- S. Weimer, A. Mauromoustakos, R. Wideman, **D. Koltes**, K. Christensen, Y. Vizzier-Thaxton. Non-invasive methods for measuring stress and lesion severity attributed to bacterial chondronecrosis with osteomyelitis in four and five-week old broilers. International Poultry Scientific Forum. Jan. 31-Feb. 2, 2017
- S. Weimer, A. Mauromoustakos, R. Wideman, **D. Koltes**, K. Christensen, Y. Vizzier-Thaxton. Infrared thermography as a non-invasive method for measuring stress in one-week old broiler chicks. International Poultry Scientific Forum. Jan. 31-Feb. 2, 2017
- S. Weimer, A. Mauromoustakos, R. Wideman, **D. Koltes**, K. Christensen, Y. Vizzier-Thaxton. Infrared thermography utilization as a predictive evaluator of bacterial chondronecrosis

- severity in clinically lame broilers. International Poultry Scientific Forum. Jan. 31-Feb. 2, 2017
- M. Baxter, J.D. Latorre, N. Anthony, S. Bickler, **D.A. Koltes**, S.C. Ricke, S. Park, S. Dridi, E.S. Greene, R. Merino, B.M. Hargis G. Tellez. 2016. Nutritional rehabilitation responses in two genetic lines of chickens. Symposium on Gut Health in Production of Food Animals. November 14-16, 2016.
- K.D. Christensen, S. L. Weimer, X. Sun, B. A. Mallmann, C. M. Owens, **D. A. Koltes**. 2016. Association of live parameters with white striping at various ages in male broiler chickens. PSA Annual meeting. Poult. Sci. 95(E-Suppl. 1).
- K.D. Christensen, S. L. Weimer, X. Sun, B. A. Mallmann, C. M. Owens, **D. A. Koltes**. 2016. Live indicators of woody breast in commercial male broiler chickens at various ages. PSA Annual meeting. Poult. Sci. 95(E-Suppl. 1).
- S.L. Weimer, R.F. Wideman, **D. A. Koltes**, K.D. Christensen, Y. Vizzier-Thaxton. 2016. Effect of light intensity and flooring type on leg surface temperature, leg bone necrosis, and latency to lie of broilers tested individually and in groups. PSA Annual meeting. Poult. Sci. 95(E-Suppl. 1).
- D.A. Koltes**, S.L. Weimer, X. Sun, B. A. Mallman, C. M. Owens, K. D. Christensen, T. York, and C. Wyatt. 2016. The addition of phytase to the diet does not contribute to woody breast or white striping in commercial male broilers. PSA Annual meeting Poult. Sci. 95(E-Suppl. 1).
- V. Mani, J. K. Rubach, **D. A. Koltes**, N. K. Gabler, and M. J. Poss. 2015. The protective effects of Butipearl™ Z during heat stress as measured through *in vitro* studies with swine intestinal epithelial cells and an *in vivo* swine trial. J. Anim. Sci. Vol. 94, E-Suppl. 2
- S.L. Weimer, R.F. Wideman, **D.A. Koltes**, W. Kuenzel, C. Maxwell. K.D. Christensen, and Y. Vizzier-Thaxton. 2015. Time-course comparison of classical and non-invasive measurements of corticosterone with broilers given corticosterone in the drinking water. International Poultry Scientific Forum. Jan. 25-28, 2016. Poult. Sci. 95(E-Suppl. 1).
- D.A. Koltes** and N.K. Gabler. 2015. Characterization of porcine enteroid cultures under a lipopolysaccharide challenge. Digestive Physiology of the Pig. Kliczków, Poland. May 19-21.
- D.A. Koltes** and D.M. Spurlock. 2013. Leptin increases adipose triglyceride lipase in bovine primary adipocytes. FASEB J. 27:373.8.
- D.A. Koltes** and D.M. Spurlock. 2013. Novel mechanisms involved with lipid metabolism in adipose tissue of dairy cows. ASAS/ADSA Midwest Conference. Des Moines, IA. March 11-13, 2013

D.A. Koltes and D.M. Spurlock. 2011. Energy balance alters leptin but not adiponectin mRNA in Holstein cows. J. Anim. Sci. Vol. 89, E-Suppl. 1/J. Dairy Sci. Vol. 94 E-Suppl. 1

D.M. Spurlock, A. Wolc, **D. A. Elkins**, E. Scalese, J.C.M.Dekkers, and R. Fernando. 2011. Genetic analysis of dry matter intake in Holstein cows. J. Anim. Sci. Vol. 89, E-Suppl. 1/J. Dairy Sci. Vol. 94 E-Suppl. 1

D.A. Koltes and D.M. Spurlock. 2011. Fasting induced adipocyte factor increases with reduced energy balance in lactating Holstein cows. J. Dairy Sci. Vol. 94(5):2659-2671

D.A. Elkins and D.M. Spurlock. 2010. Regulation of Adipose Triglyceride Lipase in vivo. FASEB J. 24:547.3D.

D.A. Elkins and D.M. Spurlock. 2008. Adipose triglyceride lipase is a novel lipase in dairy cattle. J. Anim. Sci. Vol. 86, E-Suppl. 2/J. Dairy Sci. Vol. 91, E-Suppl. 1

D.A. Elkins, H.L. Park, and D.M. Spurlock. 2008. Phosphorylation of perilipin is associated with lipolytic activity in dairy cows. J. Animal Sci., Volume 86, E Supplement 3

Industry Reports

D.A. Elkins and D.M. Spurlock. 2009. Phosphorylated perilipin abundance associated with energy mobilization in lactating dairy cows. Iowa State University Animal Industry Report.

Teaching Experience

Iowa State University- faculty

- *Instructor on Record: AN S 214* Domestic Animal Physiology, lecture-based undergraduate course taught both Fall and Spring. The course serves a survey class at the sophomore level covering anatomy and physiology of the muscular, renal, skeletal, neural, mammary, cardiovascular, respiratory, immune, endocrine, reproductive, and digestive systems of domestic animals. The course includes quizzes and homework for each system discussed, 4 exams plus a cumulative final. (Fall 2017-)
- *Instructor of Record: AN S 633* Seminar in Animal Reproduction, student-seminar based graduate course taught in the Fall. The course focuses on exposing students to research in the department, college, and university while allowing students the ability to practice giving scientific presentations. (Fall 2019)

University of Arkansas

- *Instructor on Record: ANSC/POSC 5942* Endocrine Physiology of Domestic Animals, taught an 8-week course over the mechanisms of hormone secretion, function and regulation of hormones in domestic animals. The course focused on the role of hormones within a physiological process (nutrient uptake, energy balance, growth, etc.), and included peer-reviewed paper discussion of hormones within these systems.

Students were also assigned to write a 6-pg grant following the USDA pre-doctoral format and review 2 of their peers' grants. (2015,2016)

- *Lecturer: ANSC 5743L* Advanced Analytical Methods in Animal Science Laboratory, guest lectured 1 lecture and 2 labs covering methodologies used in cell culture. The lab consisted of the students isolated bovine adipocytes and stromal vascular cells from adipose tissue. Stromal vascular cells were plated using aseptic cell culture techniques and students check for proliferation and contamination 5 days later (2015). Added 2 lectures over RNA structure, functions, and molecular techniques utilizing RNA. (2016).
- *Guest-Lecturer: POSC 4343* Poultry Nutrition, Lectured one 1-hour class over the lower half of the small intestines. **ANSC 4452** Milk Production, Lectured one 3-hour class over lactation physiology. **POSC 1012** Avian Biology, Lectured one 1-hour class over differences between ethics and animal welfare.

Iowa State University- graduate student

- *Lecturer: Nutritional Science 503* Adipose Tissue Biology, guest lectured for 3 of the 15 weeks of class on Integrated lipid metabolism in dairy cattle, Methodologies used to study adipose tissue, Transcriptomics, and Emerging information about adipose tissue browning and microRNAs (2013). **Animal Science 352** Livestock improvement through animal breeding, guest lectured on Multiple Trait Selection (2012); guest lectured on Weighted Averages (2007). **Animal Science 345** Animal growth and development, guest lectured on Lipid Metabolism (2011). **Animal Science 214** Domestic Animal Physiology, guest lectured on the Ruminant Gastrointestinal System (2009, 2010).
- *Teaching assistant: Animal Science 352* Livestock improvement through animal breeding with Dr. Philip Spike (2007) and Dr. Diane Spurlock (2012); responsible for a weekly hands-on lab section (both years), and **Animal Science 214** Domestic Animal Physiology with Dr. Joshua Selsby (2009 and 2010); responsible for grading weekly quizzes.

Service to the Department

- Co-chair for local Academic Quadrathlon: Involved in planning and organization of the local 2019 academic quadrathlon that will select the team of students to represent Iowa State University at the regional level.
- University of Arkansas Academic Quadrathlon: Aided with questions and grading for Dairy and Poultry Sections (2015-2016).
- *Animal Breeding and Genetic Graduate Student Organization Family Pancake Breakfast*: Assisted in the organization of the first and second annual alumni/ student networking breakfast (2011, 2012).
- *Iowa State University Academic Quadrathlon*: Served on the departmental committee, assisted in organization of the quadrathlon, and the dairy practical station of this event (2011- 2013).

- *Departmental Undergraduate Poster Competition*: Judged undergraduate posters from students participating in undergraduate honor research projects and the Science with Practice program (2010-2013).
- *Midwest Academic Quadrathlon*: Assisted in organization and supervision of the dairy practical station of this event (2009-2013).
- *Iowa State University Dairy Days*: Gave tours of the Iowa State University Dairy during the annual event that brought over 1000 people to the dairy (2010, 2013).
- *Pedigree of Animal Breeders* (www.animalgenome.org/lush): Helped enter initial thesis and dissertations from Lush and Hazel's students and assisted with curation.

Service to the Research Community

- Journal Reviews for: *Animal* (2014), *BMC Genetics* (2016), *BMC Genomics* (2015, 2016), *Journal of Animal Science* (2016), *Livestock Science* (2016, 2018), *Poultry Science* (2017), *PLoS One* (2018, 2019), *Meat and Muscle Biology* (2019, 2020).
- Special Topic editor for *Frontiers Genetics* (2017-2018)

Membership in Professional Societies

Sigma Xi (2013-)

Gamma Sigma Delta (2013-)

Poultry Science Association (2015-)