

Michael E. Persia

Associate Professor • Virginia Tech

Work Experience

Virginia Tech, Associate Professor, Animal and Poultry Science, 08/17-present
45% Research/45% Extension/10% Teaching

Virginia Tech, Assistant Professor, Animal and Poultry Science, 12/13-08/17
45% Research/45% Extension/10% Teaching

Iowa State University, Assistant Professor, Animal Science, 07/09-12/13
70% Research/30% Teaching

Syngenta Animal Nutrition, Manager, Animal Nutrition, 06/06-07/09

- Co-technical lead for registration of phytase in USA, including budget, design, conducting, interpreting and reporting of swine and poultry experiments
- Technical lead for registration of phytase enzyme in European Union and Brazil, including budget, design, conducting, interpreting and reporting of swine and poultry experiments
- Conducting collaborative research involving enzyme application and development in poultry, swine and ruminant nutrition
- Project manager early stage enzyme project designed to increase NSP utilized in animal rations
- Animal lead on for first corn expressed enzyme product for biofuels
- Animal Nutrition technical lead on dry corn fractionation business team
- Committee work: internal institutional animal welfare committee; development of SOP for coordination between technical, development and laboratory functions within Animal Nutrition Group; employee communication best practices for project leadership and management for entire seeds and biotechnology organization; reviewing and streamlining regulatory submissions to reduce timeline to submission of scientific dossier.

University of Delaware, Associate Scientist 03/03-06/06

Education

University of Illinois, Champaign-Urbana, IL 08/99-03/03

PhD. in Animal Science

Advisor: Dr. Carl Parsons

Dissertation: *Interactions between nutrition and health or stress in poultry*

The Ohio State University, Wooster, OH 06/97-08/99

Master of Science in Animal Science

Advisor: Dr. Michael Lilburn

Thesis: *The characterization of dietary enzyme supplementation on corn and wheat fed turkeys*

Bachelor of Science in Animal and Biological Sciences, Minor in Poultry Science and Technology

Honors and Awards

- Global Grand Winner (Applied Research) IWA Global PIA 2012
 - Water reclamation from ethanol production leftovers with animal feed production using a fungal process
- Gamma Sigma Delta, Illinois Chapter 2002-present

Professional and Academic Service

- NRC committee, 10th edition of the Nutrient Requirements for Poultry 2017-2020
- Poultry Science Association 1997-present
 - Director (PSA Board) 2014-2017
 - Merck Animal Health Fellowship Committee, Member 2014-2016
 - Maurice Stein Fellowship Award Committee, Chair 2015
 - Maurice Stein Fellowship Award Committee, Member 2016
 - Nutrition Program Section for PSA meeting, Senior Chair 2013
 - Nutrition Program for PSA meeting, Junior Chair 2012
 - Student Competition for PSA meeting, Chair 2011
 - Environmental Committee, Member 2006-08
 - Ad-hoc reviewer for Poultry Science 2006-present
- Southern Poultry Science Society 2003-present
 - Past President SPSS 2012-13
 - President SPSS 2011-12
 - 1st Vice President SPSS 2010-11
 - 2nd Vice President SPSS 2009-10
 - Resolutions Committee, Chair 2008
 - Ad-hoc reviewer for Journal of Applied Poultry Research 2006-present
- Mid-Atlantic Nutrition Conference, General and Poultry Committees 2013-present
- Poultry Nutrition Committee, Chair 2016-2017
 - Poultry Nutrition Committee, Chair 2018-2019
- World Poultry Science Society (USA branch) 2007-present
- American Society of Animal Science 2006-09
- Collaborating Faculty – Department of Animal Science, Iowa State University 2013-2018
- Rhodimet Research Grant, Scientific Reviewer 2012
- BARD Grant, Scientific Reviewer 2014
- Virginia Poultry Federation, Ex Officio Representative from VT 2014-present
- Virginia Egg Council, Ex Officio Representative from VT 2014-present
- Virginia Poultry Disease Task Force, Member 2014-present
- Biosecurity Auditor 2014-present
- Committee to rewrite biosecurity requirements, Member 2016
- Virginia Poultry Health and Management Seminar, Chair 2014-present
- Poultry Youth Committee, Co-Chair 2014-present
- VT Departmental Review Committee, Member 2018-2019
- VT Departmental Tenure and Promotion Committee, Member 2018-present
- VT Departmental Poultry Committee, Member 2014-present
- VT Animal Production Program Team, VCE, Member 2014-present

- VT APSC Research Day Program Committee, Member 2018
- VT Poultry Health Faculty Search Committee, Member 2016
- VT 4H Livestock (and Poultry) Youth Development Search Committee, Member 2015
- VT Poultry Farm Manager Search Committee, Member 2015
- VT IACUC Sub-Committee on SOP generation, Member 2016-present
- Poultry Club at Virginia Tech, Club Advisor 2014-present
- Iowa Egg Council, invited guest from ISU 2009-2013
- Iowa Turkey Federation, Ex Officio Representative from ISU 2009-2013
- ISU Nutritional Sciences Program, Member 2009-2013
- ISU Local Academic Quadrathlon Committee, Chair 2010-2013
- ISU Regional Academic Quadrathlon Committee, Member 2010-2013
- ISU Department Technology Fee Teaching Funds Committee, Chair 2011-2013
- ISU College Technology Fee Teaching Funds Committee, Member 2011-2013
- ISU Comparative Nutrition Faculty Search Committee, Member 2011
- ISU Block and Bridle (Main Club), Club Co-Advisor 2010-2012
- ISU Black and Bridle (Poultry Club), Club Founder and Advisor 2010-2013

Teaching Experience

Virginia Tech

(* = primary instructor)

- ALS 3204 – Animal Nutrition (3 credits)
 - Spring 2019 133 students (Guest lecture: Poultry Nutrition)
 - Fall 2018 ~ 50 students (Guest lecture: Poultry Nutrition)
 - Spring 2018 ~ 100 students (Guest lecture: Poultry Nutrition)
 - Fall 2017 ~ 50 students (Guest lecture: Poultry Nutrition)
 - Spring 2017 ~ 100 students (Guest lecture: Poultry Nutrition)
 - Fall 2016 ~45 students (Guest lecture: Poultry Nutrition)
 - Spring 2016 ~ 99 students (Guest lecture: Poultry Nutrition)
 - Spring 2015 ~111 students (Guest lecture: Poultry Nutrition)
 - Spring 2014 ~140 students (Guest lecture: Poultry Nutrition)
- APSC 1454 – Intro to Animal Science (3 credits)
 - Spring 2018 ~ 60 students (4 guest lectures: Poultry Science)
 - Fall 2017 ~ 160 students (4 guest lectures: Poultry Science)
 - Spring 2017 ~ 50 students (4 guest lectures: Poultry Science)
 - Fall 2016 ~ 160 students (4 guest lectures: Poultry Science)
 - Spring 2016 ~ 50 students (4 guest lectures: Poultry Science)
 - Fall 2015 ~ 160 students (4 guest lectures: Poultry Science)
 - Spring 2015 ~ 50 students (4 guest lectures: Poultry Science)
 - Fall 2014 ~140 students (4 guest lecturers: Poultry Science)
 - Spring 2014 ~ 50 students (4 guest lectures: Poultry Science)
- APSC 1464 – Intro to Animal Science Lab (1 credit)
 - Spring 2019 ~ 70 students (3 guest labs: Poultry Science)
 - Fall 2018 ~ 150 students (6 guest labs: Poultry Science)
 - Spring 2018 ~ 75 students (3 guest labs: Poultry Science)
 - Fall 2017 ~ 160 students (6 guest labs: Poultry Science)
 - Spring 2017 ~ 50 students (2 guest labs: Poultry Science)
 - Fall 2016 ~ 160 students (6 guest labs: Poultry Science)
 - Spring 2016 ~ 50 students (2 guest labs: Poultry Science)

Fall 2015 ~ 160 students (7 guest labs: Poultry Science)
Spring 2015 ~ 70 students (3 guest labs: Poultry Science)
Fall 2014 ~ 140 students (6 guest labs: Poultry Science)
Spring 2014 ~ 70 students (co-taught with Dr. Wood)*

- APSC 4004 – Animal Issues
Spring 2019 ~ 75 students (guest lecture: Poultry Issues)
Fall 2018 ~ 60 students (guest lecture: Poultry Issues)
Spring 2018 ~ 60 students (guest lecture: Poultry Issues)
Fall 2017 ~ 60 students (guest lecture: Poultry Issues)
Spring 2017 ~ 60 students (guest lecture: Poultry Issues)
Fall 2016 ~ 60 students (guest lecture: Poultry Issues)
Spring 2016 ~ 60 students (guest lecture: Poultry Issues)
Fall 2015 ~ 60 students (guest lecture: Poultry Issues)
Spring 2015 ~ 60 students (guest lecture: Poultry Issues)
Fall 2014 ~ 60 students (guest lecture: Poultry Issues)

- **APSC 4404 – Poultry Enterprise Management (4 credit)***
Fall 2018 (17 students)
Fall 2017 (9 students)
Fall 2016 (10 students)
Fall 2015 (12 students)
Fall 2014 (16 students)

Iowa State University

- An S 214 – Domestic Animal Physiology (3 credits)
Spring 2010 – guest lecturer 2 lectures on bone physiology (~ 50 students)

- **An S 223 – Introduction to Poultry Science (3 credits)***
Fall 2013 – (40 students)
Fall 2012 – (40 students)
Fall 2011 – (35 students)
Fall 2010 – (23 students)
Fall 2009 – guest lecturer 2 lectures (~25 students)

- An S 320 – Animal Feeds and Feeding (3 credits)
Spring 2014 – guest lecturer 2 lectures (~75 students)
Fall 2013 – guest lecturer 2 lectures (~30 students)
Spring 2013 – guest lecturer 2 lectures and one lab (~15 students)
Fall 2012 – guest lecturer 2 lectures (~25 students)

- **An S 480G – Poultry Leadership and Fellows (1 credit)***
Fall 2013 – (6 students)
Fall 2012 – (5 students)

- An S 515 – Integrated Crop and Livestock Production Systems
Fall 2013 – guest lecturer 1 lecture on poultry production (~ 15 students)
Fall 2011 – guest lecturer 1 lecture on poultry production (~ 10 students)
Fall 2009 – guest lecturer 1 lecture on poultry production (~ 10 students)

- **An S 518 – Non-ruminant Nutrition (3 credits)***
Spring 2013 – co-instructor with Dr. Nick Gabler 50% (16 students)
Spring 2011 – co-instructor with Dr. Nick Gabler 50% (14 students)

- **An S 603 – Animal Nutrition Seminar (1 credit)***
Fall 2011 – co-instructor with Dr. Jim Russell 50% (23 students)

Midwest Poultry Consortium – Center of Excellence

- **AS 314 – Poultry Nutrition (3 credits)***
Summer 2014 – Co-instructor with Dr. Todd Applegate from Purdue 50% (15 students)
Summer 2013 – Primary instructor (17 students)
Summer 2012 – Primary instructor (12 students)
Summer 2011 – Co-instructor with Dr. Mike Lilburn from OSU 50% (15 students)
Summer 2010 – Co-instructor with Dr. Mike Lilburn from OSU 50% (14 students)

University of Delaware

- **AnSc 101H Intro to Animal Sciences Honors (1 credit)***
Fall 2005 – (10 students)
Fall 2004 – (8 students)

Graduate Mentoring

Student	Degree	Major	Graduation Date
1. Green, JJ	MS	Animal Science	07/2011
Effects of feeding high concentrations of cholecalciferol on the performance and mineral metabolism of poultry species First Employment as Animal Nutritionist at Chapin Manufacturing, Batavia, NY			
2. Murugesan, G. Raj	PhD	IGPNS ¹	05/2013
Changes in intestinal physiology modified by exogenous enzymes and direct-fed microbial on gut integrity, energy metabolism, body composition and performance of poultry First Employment as Poultry Technical Specialist at Biomin America, San Antonio, TX			
3. Bolek, Kevin	MS	IGPNS	07/2013
The effect of chick methionine status and methionine source on broiler performance and physiological response to heat stress PhD in Nutritional Science at University of California-Davis, Davis, CA			
4. Walugembe, Muhammed	MS	Animal Science	07/2013
Impact of high and low dietary fiber on various strains of chickens with divergent growth rates (Co-advised with Dr. Max Rothschild) PhD in Animal Science at Iowa State University, Ames, IA			
5. Hanson, Matie	MS	Animal Science	07/2014
Effects of exogenous enzymes and direct-fed microbial on broiler performance and nutrient digestibility when fed variable inclusions of soy products First Employment as Animal Nutritionist at US Feeds, Eldora, IA			
6. Gareis, Alysha	BS/MS	Animal Science	12/2014
Effects of two feed additives on performance, energy digestibility, and body composition of first-cycle laying hens fed two concentrations of dietary energy. First Employment as Quality Assurance Lab Manager at Consumer’s Supply Distributing LLC., North Sioux City, SD.			
7. Connie Mou	MS	APSC ²	08/2016

The effects of various concentrations of phytase on broiler growth performance, phosphorus digestibility, tibia ash, and phosphorus utilization.

PhD in Poultry Science at University of Georgia, Athens, GA

8. Barrett, Nathaniel MS APSC 10/2016

The Acute and Chronic Effects of a Cyclic Heat Stress on 24 to 28 Week Old Laying Hens on Performance, Egg Quality, Apparent Metabolizable Energy, and Blood Chemistry.

Research Program Manager, Virginia Tech, Blacksburg, VA

9. Zumbaugh, Chuck MS APSC 12/2017

Evaluation of a phytogetic feed additive on performance, nutrient digestion, and absorption in turkey poults.

PhD in Animal Science at Virginia Tech, Blacksburg, VA

10. Jamie Lewis MS APSC 12/2017

Non-Thesis Option

11. James Wen PhD APSC 05/2018

Effect of Amino Acids and Vitamin D on Performance and Biological Response in Poultry.

Technical Services Manager at Evonik Inc, Alpharetta, GA

12. Danielle Lewis MS APSC 08/2018

Effects of Direct-Fed Microbial Products, Butyrate, and Botanicals on Performance and Health of Broilers Raised on Used Pine Shaving Litter.

Veterinary School, Virginia-Maryland College of Veterinary Medicine, Blacksburg, VA

¹ Interdepartmental Graduate Program in Nutritional Sciences

² Animal and Poultry Science

Current Graduate Students

Alamanda Calvert PhD APSC 10/2019 (expected)

(Co-advised with Dr. Audrey McElroy)

Albaraa Sarsour PhD APSC 05/2021 (expected)

Undergraduate Research Mentoring

Student	Research Program	Semester
1. Kylie Gudenkauf	Science with Practice	SP 2009
The effects of high concentration feeding of phytase on chicken gastro-intestinal health		
2. Robin Lemoine	Science with Practice	SP 2010
Nutritional evaluation of alternative soy processing techniques for poultry		
3. Neva Nachtrieb	Research Internship	SU 2010
4. Emily Smith	Science with Practice	SP 2011
Evaluation of various carbohydrate degrading enzymes on broiler performance and carcass characteristics		
5. Jiomar Santiago	George Washington Carver	SU 2011
Effects of direct fed microbials supplementation on endotoxin transport, trans-epithelial resistance and performance in broiler chickens		
6. Jessica Profitt	Science with Practice	FA 2011
Energy Content for Alternatively Processed Ethanol By-Products		
7. Ceslie Ozbun	Science with Practice	SP 2012
Evaluation of energy values of various sources of oils sources when fed to poults		
8. Jessica VandeVorde	Honors Scholar	SP 2012
Interactions of enzymes and DFM's in terms of nutrient absorption in broilers		
9. Alysha Gareis	Science with Practice	SP 2012
The digestibility effects of an added enzyme in DDGS		
10. Jiomar Santiago	George Washington Carver	SU 2012

Exogenous enzymes and direct-fed microbials on energy metabolism in broiler chickens		
11. Matie Hansen	Science with Practice	FA 2012
Increasing soy utilization in broiler diets: Effects of enzymes and direct fed microbials		
12. Hannah Phillips	Science with Practice	SP 2013
The evaluation of enzyme combinations on energy utilization in first-cycle layers		
13. Connie Mou	Science with Practice	FA 2013
Effects of commercial and super doses of phytase on pullet growth and performance		
14. Abby Sindt	Science with Practice	FA 2013
Effects of commercial and super doses of phytase on pullet bone integrity		
15. Jamie Lewis	Science with Practice	FA 2013
Evaluation of feeding flaxseed oil on egg yolk fatty acid content of first-cycle laying hens		
16. Jessica VandeVorde	Honors Scholar	FA 2013
Characteristics of Male Fertility in Brown Egg Layer Breeder Lines		
17. Levi Gardner	Pratt Fellowship	SU 2014
Evaluation of the feeding value of various barley cultivars using a precision-fed chick assay		
18. Stuart Hill	Capstone Research	FA 2014
Evaluation of a New Barley Cultivar and Ingredient Form (whole v. ground) on the Performance and Nutrient Digestibility of Broiler Chickens		
19. Trey Nelson	Capstone Research	SP 2015
Determination of Freezer Yield Loss of Commercially Produced Individual Quick Freeze (IQF) Chicken Products		
20. Katie Ritenour	Nutrition Honors Project	SP 2015
Digestible Energy of Hulled vs. Hulless Barley Varieties		
21. Alisa Gusterer	Capstone Research	SP 2015
Investigation of the nutritional and immune benefits of feeding a microbial protein product to laying hens		
22. Brittany Singh	Pratt Fellowship	SU 2015
Calcium Concentration's Effect on DDGS Extracted Corn Oil Digestibility in Commercial Broiler Chicks (awarded 1 st place poster at Mid-Atlantic Nutrition Conference poster competition)		
23. Jon Howard	MAOP	Su 2015
Effects of Lactoplan on live performance of broilers challenged with an avian E. coli		
24. Brittany Singh	Capstone Research	SP 2016
Microbial Inhibition as a Result of Chlorine's Effect on Water-Soluble Antibiotics		
25. Katie Ritenour	Capstone Research	SP 2016
Microbial Inhibition of Water-Soluble Antibiotics		
26. Kerri Hardin	Capstone Research	SP 2016
Ileal Amino Acid and True Metabolizable Energy of a Microbial Protein Product in Commercial Broilers		
27. M. Danielle Lewis	Pratt Fellowship	FA2016
Effects of Concentration of DDGS Extracted Corn Oil on Digestibility in Commercial Broiler Chickens		
28. M. Danielle Lewis	Capstone Research	SP 2017
Effects of Concentration of DDGS Extracted Corn Oil on Digestibility in Commercial Broiler Chickens (awarded 2nd place poster at Mid-Atlantic Nutrition Conference poster competition)		
29. Nina Lee	Capstone Research	FA2017
The effects of phytase addition to broiler diets on inflammation and immune response of the digestive tract (presented at Mid-Atlantic Nutrition Conference poster competition)		
30. Kristyn Lucci	Capstone Research	SP2018

Effects of Glucanase on Performance in Poultry		
31. Emma Strough	Capstone Project	FA2018
Biosecurity Management and Adaptation for the Paul B. Siegel Poultry Research Center at Virginia Tech's Chicken Hill.		
32. Becky Tran	Fralin Fellowship	2018-2019
Effects of Direct Fed Microbials on the blood chemistry, core body temperature and performance of heat stressed broiler chickens.		
33. Alyssa Lyons	Capstone Project	SP2019
Effects of dried egg product on the growth and performance of growing broiler chickens.		
34. Alicia Arneson	Capstone Project	SP2019
Tryptophan requirements of first cycle laying hens from 18 to 30 wk of age, with a focus on early egg weights and egg mass		
35. Alyssa Lyons	Pratt Fellowship	FA2019
Energy Requirements in Laying Hens: Using imaging technology to increase precision energy measurements		

Committee Service

Student	Degree	Graduated
1. Jen Puttress	BS w/ Honors	05/2010
2. Erika Fierstone	MS	11/2010
3. Hanna Sun	MS	08/2011
4. Laurie Walker	MS	08/2011
6. Derrick Coble	PhD	07/2013
7. Sara Pearce	PhD	07/2014
8. Chris Ott	MS	07/2015
9. Shuai Zhang	PhD	07/2016
10. Shaimaa Hamad	MS	09/2016
11. Nishchal Sharma	PhD	05/2017
(External Reviewer for University of New England)		
12. Antoiene Ehouman	MS (non-thesis)	08/2018
13. Kadajah Russell	MS	12/2018
14. John Ignosh	PhD	05/2020 (expected)
15. Doug Liebe	PhD	05/2020 (expected)
16. Aaron Oxendine	MS	05/2020 (expected)

Publications

Peer Reviewed Manuscripts

- 1) Barrett, N.W. K. Rowland, C.J. Schmidt, S.J. Lamont, M.F. Rothschild, C.M. Ashwell, **M.E. Persia**. 2019. Effects of Acute and Chronic Heat Stress on the Performance, Egg Quality, Body Temperature and Blood Gas Parameters of Laying Hens. *Poult. Sci.* (Submitted).
- 2) Monson, M.S., A.G Van Goor, C.M. Ashwell, **M.E. Persia**, M.F. Rothschild, C.J. Schmidt and S.J. Lamont. 2019. Genetic lines respond uniquely to acute heat stress and low dose lipopolysaccharide within the chicken thymic transcriptome. *Scientific Reports* (Submitted).
- 3) Rowland, K., C.M. Ashwell, **M.E. Persia**, M.F. Rothschild, C. Schmidt, S.J. Lamont. 2019. Genetic analysis of production, physiologic, and egg quality traits in heat-challenged

commercial white egg-laying hens using 600k SNP array data. *Genetics Selection Evolution*. (Submitted).

- 4) Wen, J., K.A. Livingston, and **M. E. Persia**. 2019. Effect of high concentrations of dietary vitamin D3 on pullet and laying hen performance, skeleton health, eggshell quality and yolk vitamin D3 content when fed to W36 laying hens from day of hatch until 68 weeks of age. *Poult. Sci.* (Accepted).
- 5) Rowland, K., **M.E. Persia**, M.F. Rothschild, C. Schmidt, S.J. Lamont. 2019. Venous blood gas and chemistry components are moderately heritable in commercial white egg-laying hens under acute or chronic heat exposure. *Poult. Sci.* (In press).
- 6) Wen, J., A. Helmbrecht, M.A. Elliot, J. Thomson, and **M.E. Persia**. 2019. Evaluation of the tryptophan requirement of small-framed first cycle laying hens. *Poult. Sci.* 98:1263-1271. <http://dx.doi.org/10.3382/ps/pey447>
- 7) Wen, J., A. Helmbrecht, M.A. Elliot, J. Thomson, and **M.E. Persia**. 2019. Evaluation of the valine requirement of small-framed first cycle laying hens. *Poult. Sci.* 98:1272-1279. <http://dx.doi.org/10.3382/ps/pey448>
- 8) Jiang, S., S. Lamont, **M.E. Persia**. 2018. Differential growth performance and intestinal immune gene expression in diverse genetic lines of growing chickens fed a high concentration of supplemental phytase. *J. Ag. Sci.* 156:258-264. <https://doi:10.1017/S0021859618000096>.
- 9) Matarneh, S., C.-N. Yen, J. Elgin, M. Beline, S. Saulo, J. Wicks, E. England, R. Dalloul, **M.E. Persia**, I. Omara, H. Shi, and D.E. Gerrard. 2018. Phosphofructokinase and mitochondria partially explain the high ultimate pH of broiler pectoralis major muscle. *Poult. Sci.* 97:1808–1817 <http://dx.doi.org/10.3382/ps/pex455>
- 10) Monson, M.S., A.G. Van Goor, C.M. Ashwell, **M.E. Persia**, M.F. R, C.J. Schmidt and S.J. Lamont. 2018. Immunomodulatory effects of heat stress and lipopolysaccharide on the bursal transcriptome in two distinct chicken lines. *BMC Genomics* 19:643 <https://doi.org/10.1186/s12864-018-5033-y>
- 11) Ott, C.P., I.I. Omara, **M.E. Persia**, R.L. Payne, R.A. Dalloul. 2018. The impact of β -glucans on performance and response of broiler chickens during a coccidiosis challenge. *Poult. Sci.* 97:2713–2721 <http://dx.doi.org/10.3382/ps/pey148>
- 12) Daughtry, M., E. Berio, Z. Shen, E. Suess, N. Shah, A. Geiger, E. Berguson, R. Dalloul, **M.E. Persia**, H. Shi, D. Gerrard. 2017. Satellite Cell-mediated Breast Muscle Regeneration Decreases with Broiler Size. *Poult. Sci.* 96:3457–3464. <https://doi.org/10.3382/ps/pex068>
- 13) Ehr, I.J., **M.E. Persia**, and E.A. Bobeck. 2017. Comparative omega-3 fatty acid enrichment of egg yolks from first-cycle laying hens fed flaxseed oil or ground flaxseed. *Poult. Sci.* 96: 1791–1799. <http://dx.doi.org/10.3382/ps/pew462>
- 14) Evans N.P., Collins D.A., Pierson F.W., Mahsoub H.M., Sriranganathan N., **Persia M.E.**, Karnezos T.P., Sims M.D., Dalloul R.A. 2017. Investigation of Medium Chain Fatty Acid Feed Supplementation for Reducing Salmonella Typhimurium Colonization in Turkey Poults. *Foodborne Pathog Dis* 14:531-536.

- 15) Foltz, K.L., M.M. Ritzi, N.W. Barrett, N.P. Evans, D. Collins, N. Sriranganathan, H. Mahsoub, R.A. Dalloul, J. Sewell, and **M.E. Persia**. 2017. Efficacy of *Lactobacillus plantarum* supplementation in broilers challenged with avian pathogenic *Escherichia coli* and *Salmonella Typhimurium*. *J Appl Poult Res*. DOI: 10.3382/japr/pfw074.
- 16) Murugesan, R.; B.J. Kerr, **M.E. Persia**. 2017. Energy content of select dietary supplemental lipids for broilers, turkeys, and laying hens. *J Appl Poult Res*. 26:536–547
- 17) Reis, M., E. Fassani, A.A. Garcia, P. Rodrigues, N. Barrett, **M.E. Persia**, and C. Schmidt. 2017. Effect of *Bacillus subtilis* (DSM 17299) on performance, digestibility, intestine morphology and pH in broiler chickens. *J Appl Poult Res*. 26:573-583.
- 18) Van Goor, A., C.M. Ashwell, **M.E. Persia**, M.F. Rothschild, C.J. Schmidt and S.J. Lamont. 2017. Unique Genetic Responses Revealed in RNA-seq of the Spleen of Chickens Stimulated with Lipopolysaccharide and Short-Term Heat. *Plos One*. 12(2): e0171414. doi:10.1371/journal.pone.0171414
- 19) Bjorkquist, A.G., C.M. Ashwell, **M.E. Persia**, M.F. Rothschild, C.J. Schmidt and S.J. Lamont. 2016. QTL for blood chemistry components of an advanced intercross line of chickens under heat stress. *BMC Genomics*. 17:287-302. DOI 10.1186/s12864-016-2601-x.
- 20) Fleming, D.S., J.E. Koltjes, E.R. Fritz-Waters, M.F. Rothschild, C.J. Schmidt, C.M. Ashwell, **M.E. Persia**, J.M. Reecy, S.J. Lamont. 2016. Single nucleotide variant discovery of highly inbred Leghorn and Fayoumi chicken breeds using pooled whole genome resequencing data reveals insights into phenotype differences. *BMC Genomics*. 17:812. DOI 10.1186/s12864-016-3147-7.
- 21) Fleming, D.S., J.E. Koltjes, A.D. Markey, C.J. Schmidt, C.M. Ashwell, M.F. Rothschild, **M.E. Persia**, J.M. Reecy and S.J. Lamont. 2016. Genomic analysis of Ugandan and Rwandan chicken ecotypes using a 600k genotyping array. *BMC Genomics*. 17:407-423. DOI: 10.1186/s12864-016-2711-5.
- 22) Schaal, T., J. Arango, A. Wolc, J. Brady, J. Fulton, I. Rubinoff, I. Ehr, **M.E. Persia**, and N. O'Sullivan. 2016. Commercial Hy-Line W-36 pullet and laying hen venous blood gas and chemistry profiles utilizing the portable i-STAT® analyzer. *Poult. Sci*. 95:466–471.
- 23) Davis, R.V., S.J. Lamont, M.F. Rothschild, **M.E. Persia**, C.M. Ashwell, and Carl J. Schmidt. 2015. Transcriptome Analysis of Post-Hatch Breast Muscle Development in Legacy and Modern Broiler Chickens. *PLoS ONE* 10(3): e0122525. doi:10.1371/journal.pone.0122525.
- 24) Ehr, I.J., B.J. Kerr and **M.E. Persia**. 2015. Effects of peroxidized corn oil on performance, AMEn and abdominal fat pad weight of broiler chicks. *Poult. Sci*. 94:1629–1634.
- 25) Schmidt, C.J., E.M. Pritchett, L. Sun, R.V.N. Davis, A. Hubbard, K.E. Kniel, S.M. Markland, Q. Wang, C. Ashwell, **M. Persia**, M.F. Rothschild, and S.J. Lamont. 2015. RNA-seq: Primary Cells, Cell Lines and Heat Stress. *Cytogenet Genome Res* 2015;145:78–179 DOI: 10.1159/000430927.
- 26) Van Goor, A.G., K.J. Bolek, C.M. Ashwell, **M.E. Persia**, M.F. Rothschild, C.J. Schmidt, and S.J. Lamont. 2015. Identification of quantitative trait loci for body temperature, body weight,

breast yield, and digestibility in an advanced intercross line of chickens under heat stress. *Genet Sel Evol* 47:96 DOI 10.1186/s12711-015-0176-7.

- 27) Walugembe, M., J.C.F. Hsieh, N.J. Koszewski, S.J. Lamont, **M.E. Persia**, and M.F. Rothschild. 2015. Effects of dietary fiber on cecal short fatty acid and cecal microbiota of broiler and laying hen chicks. *Poult. Sci.* 94:2351–2359.
- 28) Bobeck, E.A., N.A. Nachtrieb, A.B. Batal and **M.E. Persia**. 2014. Effects of xylanase supplementation of corn-soybean meal-dried distiller's grain diets on performance, metabolizable energy and body composition when fed to first-cycle laying hens. *J. Appl. Poult. Res.* 23:1–7.
- 29) Coble, D.J., D. Fleming, **M.E. Persia**, C.M. Ashwell, M.F. Rothschild, C.J. Schmidt and S.J. Lamont. 2014. RNA-seq analysis of broiler liver transcriptome reveals novel responses to high ambient heat. *BMC Genomics* 2014, 15:1084 doi:10.1186/1471-2164-15-1084
- 30) Murugesan, G.R. and **M.E. Persia**. 2014. Efficiency of a direct fed microbial and xylanase enzyme on the dietary energy efficiency and performance of broiler chickens. *J. Sci. Food Agric.* DOI 10.1002/jsfa.6984.
- 31) Murugesan, G.R., L. Romero and **M.E. Persia**. 2014. Effects of protease, phytase and a *Bacillus* sp. direct-fed microbial on nutrient and energy digestibility, ileal brush border digestive enzyme activity and cecal short-chain fatty acid concentration in broiler chickens. *PLoS ONE* 9(7): e101888. doi: 10.1371/journal.pone.0101888.
- 32) Murugesan, G.R., N. K. Gabler and **M.E. Persia**. 2014. Effects of direct-fed microbial supplementation on broiler performance, intestinal nutrient transport and integrity under experimental conditions with increased microbial challenge. *Br. Poult Sci.* 55:1, 89-97.
- 33) Schoonmaker, J.P., **M.E. Persia**, and D.C. Beitz. 2014. Effect of feeding corn modified to contain a unique amylase on performance and carcass characteristics of feedlot steers. *Professional Animal Scientist* 2014 30:561-565.
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Popular Press/Extension Articles and Presentations

- 1) Persia, M.E. Recent Advances in Poultry Nutrition. Presented at Poultry Research Group Seminar. Blacksburg, VA, April 4, 2019.
- 2) Persia, M.E. Effects of butyrate and botanical feed additives on the performance of broilers raised on used pine shaving litter. Video published by Engormix.com. March 20, 2019.
- 3) Persia, M.E. Effects of protease treatment on broiler chick ileal amino acid digestibility and apparent metabolizable energy. Video published by Engormix.com. March 20, 2019
- 4) Urban Poultry Keeping. Presented at Backyard Poultry Seminars, Chesterfield, VA. March 16, 2019.
- 5) Virulent Newcastle Disease: California 2018-2019. Presented at Issues, Current Topics, and Updates- Animal Production as part of the VCE Professional Development Web-conference. Blacksburg, VA, February 7, 2019.
- 6) Virginia Tech Update. Presented at the Virginia Poultry Health and Management Seminar, Weyers Cave, VA, August 8, 2018.
- 7) Poultry Nutrition Basics for the Small Flocks. Presented at Livestock-Dairy-Forages In service, Blacksburg, VA, June 5-7, 2018.
- 8) Biosecurity: Why Is It Important for small producers? Presented at BACKYARD POULTRY: RAISING POULTRY IN SMALL FLOCKS, The Franklin Center, Rocky Mount, VA, May 1, 2018.
- 9) Biosecurity: Why Is It Important? Presented at Poultry Youth Day, Rockingham Fair Grounds, Harrisonburg, VA, April 27, 2018.

- 10) Persia, M.E. High concentrations of dietary vitamin D. Video published by Engormix.com. March 2, 2018.
- 11) Persia M.E. Effects of various concentrations of butyric acid in broilers. Video published by Engormix.com. March 2, 2018.
- 12) The Importance of Biosecurity and Poultry Health for Urban Poultry Growers. Joint presentation (J. Walters, and M.E. Persia) at Virginia Urban Agriculture Summit, Arlington, VA, October 5th, 2017.
- 13) Biosecurity and health aspects of poultry rearing in urban settings. Joint presentation (L. Jacobs, J.S. Garcia, J. Walters, and M.E. Persia) at Virginia Urban Agriculture Summit, Arlington, VA, October 5th, 2017.
- 14) Virginia Tech Update. Presented at the Virginia Poultry Health and Management Seminar, Weyers Cave, VA, August 9, 2017.
- 15) Transitions to antibiotic-free poultry production: Poultry farmers and producers will need help. Presented at Livestock-Dairy-Forages In service, Blacksburg, VA. June 8, 2017.
- 16) Virginia Tech Activities. Presented at Virginia Poultry Health and Management Seminar. Weyers Cave, Virginia. August 10, 2016.
- 17) What do my birds need to thrive? Presented at Small-Flock Poultry Workshop. Giles County, VA. June 2, 2016.
- 18) What do my birds need to thrive? Presented at Small-Flock Poultry Workshop. Christiansburg, VA. May 19, 2016.
- 19) What do my birds need to thrive? Presented at Small-Flock Poultry Workshop. Dublin, VA. March 8, 2016.
- 20) Building a better bird with nutrition. Presented at Small-Flock Poultry Workshop. Dublin, VA. March 8, 2016.
- 21) Why is biosecurity important to the poultry industry? Presented at the Food Animal Practitioners Club, Virginia-Maryland Regional Veterinary School. Blacksburg, VA, February 24, 2015.
- 22) Nutrition: What Can I Feed the Chickens That I Can Raise Myself? Presented at the 2014 Small-Scale Egg Production in a Range Setting Field Day. Goldsboro, NC, September 24, 2014.
- 23) Biosecurity: Why Is It Important to Small Producers? Presented at the 2014 Small-Scale Egg Production in a Range Setting Field Day. Goldsboro, NC, September 24, 2014.
- 24) Urban Poultry Biosecurity. Presented at VCE Professional Development Conference, Blacksburg, VA. February 27, 2014.
- 25) Hanson, M.N. and M.E. Persia. 2014. Effects of Dietary Soy Inclusion on Broiler Chick Performance and Metabolizable Energy. [AS-Leaflet-R2896](#)

- 26) Ehr, I., B.J. Kerr and M.E. Persia. 2014. Effect of Slow and Rapid Peroxidation of Corn Oil on the Performance and Energy Storage of Broiler Chicks. [AS-Leaflet-R2898](#)
- 27) Hongyu, S., E.J. Lee, H. Samaraweera, M.E. Persia and D.U. Ahn. 2014. Effects of Increasing Concentrations of Corn Dried Distiller's Grains with Solubles on the Egg Production and Internal Quality of Eggs. [AS-Leaflet-R2899](#)
- 28) Murugesan G.R., Weber T.E., Persia M.E., Kerr B.J. 2013. Energy Utilization of Reduced Oil-Dried Distillers Grains with Solubles (RO-DDGS) in Broiler Chickens. Article published in Feedinfo.com.
- 29) Murugesan, G.R., B.J. Kerr and M.E. Persia. 2013. Evaluation of Energy Values of Various Oil Sources when Fed to Broiler Chicks. [AS-Leaflet-R2804](#)
- 30) Murugesan, G.R. and M.E. Persia. 2013. New Model for Examining the Energy Metabolism of Laying Hens. [AS-Leaflet-R2805](#)
- 31) Bolek, K.J. and M.E. Persia. 2013. The Effect of Chick Methionine Status on Broiler Performance and Physiological Response to Acute and Chronic Heat Stress. [AS-Leaflet-R2806](#)
- 32) Murugesan G.R., B.J. Kerr and M.E. Persia. 2012. Evaluation of Energy Values of Various Oil Sources When Fed to Poultry. Article published in Feedinfo.com.
- 33) Persia M.E., and B.J. Kerr. 2011. Effects of Dietary and Water Sulfur Concentrations on Chick Performance and Water Intake. Article published in Feedinfo.com.
- 34) Persia, M.E. 2007. Maximizing nutrient release and/or absorption through utilization of second generation phytase: Quantum Phytase™. Article published in FeedInfo.com.
- 35) Persia, M.E. and W.W. Saylor. 2006. Effects of over-processing soybean meal on phosphorus utilization of chicks. Article published in FeedInfo.com.

Invited Presentations

- 1) Persia, M.E. Reevaluation of Amino Acid Requirements of Laying Hens Selected for Egg Production and Feed Efficiency with Particular Interest in Trp and Val. Presented at Multi-State Poultry Feed and Nutrition Conference. Indianapolis, IN, May 21-22, 2019.
- 2) Vitamin D in Laying Hens: When Too Much is not Enough. Presented at Workshop USP & VT: Working on the future of animal science. Pirassununga, Sao Paulo, Brazil. January 8, 2019.
- 3) Vitamin D in Laying Hens: When Too Much is not Enough. Presented at Animal Science Seminar Series Penn State University. University Park, PA. August 31, 2018.
- 4) Antibiotic Use in Animal (Poultry) Production. Presented at update for BSR coordinated working group. Minneapolis, MN. July 12, 2018.

- 5) Vitamin D in Laying Hens: How High is High Enough? Presented at Poultry Institute, Chinese Academy of Agricultural Sciences, Jiangsu Institute of Poultry Science, Jiangsu, China. December 4, 2107.
- 6) Growth and Physiology of the bird, how it has changed and its effect on woody breast. Presented at Poultry University. Athens, GA, October, 7, 2017.
- 7) Recent research evaluating hulless barley as a feed ingredient for broilers. Presented at Feeding Hulless Barley: An opportunity to consider. Winchester, VA, March 3, 2017.
- 8) Vitamin D in laying hens: How high is high enough? Presented at the Australian Poultry Science Society Annual Meeting, Sydney, Australia, February 14, 2017.
- 9) Feed enzymes in laying hens. Presented at the Multi-State Poultry Feeding and Nutrition Conference, Indianapolis, Indiana, May 24, 2016.
- 10) Impact of enzymes and probiotics on poultry performance. Presented at Think Before We Feed: Science, Efficiency, Response, Uniformity Technical Meeting, Santa Fe, NM, May 3-6, 2016.
- 11) Measurement of energy utilization in chickens. Presented at the Midwest Poultry Federation Convention, Saint Paul, MN, March 15, 2016.
- 12) Nutrient utilization and bird performance differences among chicken breeds in response to heat stress. Presented at the Poultry Science Association Annual Meeting, Symposia: Adapting the Chicken for Climate Change. Louisville, KY, July 30, 2015.
- 13) Phytase and enzyme use in laying hen diets. Presented at the 2015 Michigan Pork and Poultry Symposium. Lansing, MI, February 19, 2015.
- 14) Evaluation of the energy content and other considerations of feeding poultry corn oil extracted during the production of dried distillers grains with solubles. Presented at the 75th Minnesota Nutrition Conference. Prior Lake, MN, September 17-18, 2014.
- 15) Feed enzyme technology: From laboratory to application. Presented at II Symposium on Emerging Issues in Poultry Nutrition and Meat Production. Raleigh, NC, August 12-15, 2014.
- 16) Measuring differences in dietary energy in laying hens: Is egg production our best method? Presented at Multi-State Poultry Feeding and Nutrition Conference, Indianapolis, IN, May 20-22, 2014.
- 17) Effects of Enzyme and DFM Combinations on Chicken Performance and Energy Metabolism. Presented at Mid-Atlantic Nutrition Conference, Timonium, MD, March 27, 2014.
- 18) Further Thoughts on Energy Utilization in Poultry. Presented at Texas A & M University. College Station, TX. November 4, 2013.

- 19) Effects of high concentration vitamin D enriched diets on egg vitamin D content, hen production, and egg quality. Presented at the Iowa Poultry Association Fall Festival. West Des Moines, IA. September 12, 2013.
- 20) An update on Rhodimet Research Grants: Methionine sources and heat stress. Presented at the 7th Advancia International Methionine Seminar. Potsdam, Germany. August 26th 2013.
- 21) Notions de Base & Importance de la Nutrition des Volailles pour les Pondeuses et les Poulets de Chair. Presented at Séminaire sur la Nutrition et l'Alimentation Optimales des Volailles. Port-au-Prince, Haïti. July 17, 2013.
- 22) Economie de la Production d'Oeufs et de l'Alimentation des des Pondeuses aux EUA. Presented at Séminaire sur la Nutrition et l'Alimentation Optimales des Volailles. Port-au-Prince, Haïti. July 17, 2013.
- 23) Evaluation of energy in laying hen diets: a holistic approach. Presented at Glimpse: The future in 2020, The Alletch 29th Annual International Symposium. Lexington, KY, USA. May 19-22, 2013.
- 24) DDGS de maíz en dietas de aves: mucho más que un sub producto barato del maíz. Disponibilidad futura de este ingrediente. Presented at the XIII International Seminar on Poultry Production and Pathology. Viña del Mar, Chile November 21-23, 2012.
- 25) Re- evaluación del metabolismo energético en producción avícola: los indicadores de performance y digestibilidad son suficientes? Presented at the XIII International Seminar on Poultry Production and Pathology. Viña del Mar, Chile November 21-23, 2012.
- 26) Feeding distiller's dried grains with solubles to poultry. Presented at Feed Energy Colony Summit. Mitchell, SD, November 8, 2012
- 27) Evaluation of energy enzymes in laying hen diets: A holistic approach. Presented at Poultry Science Association Annual Meeting. Athens, GA, July 11, 2012.
- 28) Egg vitamin D enrichment through feed nutrition. Presented at 4th Annual Egg Industry Issues Forum, Denver, Colorado, April 10-11, 2012.
- 29) Anti-nutritional consequences of phytate in poultry diets. Presented at the Ensminger ISU-IAS Bilateral Academic Exchanges on Animal Science. Beijing, China, Oct 16, 2011.
- 30) Anti-nutritional consequences of phytate in poultry diets. Presented at the Ensminger ISU-HAU Bilateral Academic Exchanges on Animal Science. Wuhan, China, Oct 17, 2011.
- 31) Energy metabolism of Fat. Presented at Feed Energy Technical Symposium, Mitchell, SD, July 14, 2011.
- 32) Effects of Enzyme (Phytase) Supplementation on Intestinal Environment and Poultry Performance. Presented at the 37th Annual Poultry Nutrition Conference at the Carolina Feed Industry Association Annual Meeting, RTP, NC. November 9-10, 2010.

- 33) What goes in comes out, Part 1, Poultry. Presented at Extension Professional Development – Water Quality for Small- and Medium-sized Livestock Farms. Platteville, WI, August 10, 2010.
- 34) ABC's of Fat. Presented at Feed Energy Technical Symposium, Mitchell, SD, July 29, 2010.
- 35) An enzymatic approach to dealing with the negative consequences of phytate. Presented at Multi-State Poultry Feeding and Nutrition Conference and DSM Nutritional Products, Inc.'s Technical Symposium, May 26, 2010.
- 36) Effects of enzyme supplementation on intestinal environment and poultry performance. Presented at Mid-Atlantic Nutrition Conference, March 25, 2010.
- 37) Evaluation and use of enzymes in poultry diets. Presented at Midwest Poultry Federation Convention, March 16, 2010.
- 38) Maximizing nutrient release and/or absorption through utilization of second generation phytase: Quantum Phytase™. Presented at Arkansas Nutrition Conference. September 11, 2007.
- 39) Nutritional strategies to address air and water quality issues. Presented at Delaware Agriculture Week. January 20, 2006.

Research Grants, Contracts and Gifts

- 1) Persia, M.E., Private Contract. 2019. \$38,000. Evaluation of various feed additives in first-cycle laying hens.
- 2) Persia, M.E., Private Contract. 2019. \$49,700. Pilot Study: Comparative Evaluation of Egg Product and Chemical Anticoccidial drug on Broiler Growth Performance Raised under Antibiotic-Free (ABF) Management Practices.
- 3) Persia, M.E., Private Contract. 2018-2019. \$34,900. Tryptophan requirements of first cycle laying hens from 18 to 30 wk of age, with a focus on early egg weights and egg mass.
- 4) Persia, M.E., Private Contract. 2018. \$10,000. Recovery of Feed Additive from 0-16-day Old Broiler Chicks.
- 5) Persia, M.E. Private Contract. 2018-2019. \$49,847. Pilot Study: Response Determination of Dry Egg Product on Growth Performance of Male Broilers: Efficacy Evaluation birds raised on used litter.
- 6) Persia, M.E. Private Contract. 2018-2019. \$25,000. Effects of Butyrate and Botanical Feed additives on the Performance of Broilers raised on used pine shaving litter.
- 7) Persia, M.E. Virginia Agricultural Council. 2018-2019. \$15,000. Estimation of the Lysine and Methionine Requirements of Starter (Young) Broiler Chickens Using a Short Duration Feeding Approach.

- 8) Persia, M.E. Private Contract. 2018 – 2019. \$27,000. Effects of a feed supplement on the performance, egg quality, and skeletal health of laying hens under late egg production (46 to 72).
- 9) Persia, M.E. Private Contract. 2018-2019. \$58,110. Study to Determine the Effects of Correlink™ - ABS1781 - Bacillus subtilis on Performance Parameters of Male Broilers: Efficacy Evaluation.
- 10) Persia, M.E. Private Contract. 2018. \$23,000. Effects of enzyme treatment on broiler chick apparent metabolizable energy (AMEn) and ileal amino acid digestibility (AAD).
- 11) Persia, M.E. Pratt Foundation. 2018-2020. \$95,000. Effects of direct fed microbials on the performance, nutrient digestibility, and nutrient partitioning of growing broiler chickens exposed to increased environmental temperature.
- 12) Persia, M.E. Private Contract. 2018. 45,500. Effects of various concentrations of porcine plasma product on the performance of 42 day old broiler chicks.
- 13) Persia, M.E. Private Contract. 2017-2018. \$46,137. The use of Enhanz™ to replace synthetic glycine in 0-49 d broilers.
- 14) Persia, M.E. Private Contract. 2017-2018. \$11,000. Effect of enzymes on laying hen nitrogen corrected Apparent Metabolizable Energy (AMEn).
- 15) Persia, M.E. and K.A. Livingston. Private Contract. 2017-2018. \$15,000. Effects of Butyrate and Botanicals, Herbs and Essential Oils on the Performance of Broilers raised on used pine shaving litter.
- 16) Persia, M.E. Private Contract. 2017 – 2018. \$33,000. Effects of feed supplements on performance, and egg quality of laying hens under peak egg production (18 to 42 weeks of age).
- 17) Persia, M.E. Private Contract. 2017-2018. \$10,000. Effect of xylanase on laying hen nitrogen corrected Apparent Metabolizable Energy (AMEn) and ileal amino acid digestibility.
- 18) Persia, M.E. Private Contract. 2017-2018. \$41,525. Effects of Bacillus probiotics on the performance and health of broilers raised on used pine shaving litter.
- 19) Persia, M.E. and F.W. Pierson. Virginia Agriculture Council. 2017-2019. \$20,000. Evaluation of alternative methods for the prevention and control of histomonosis (blackhead) in turkeys.
- 20) Persia, M.E. Private Contract. 2016-2017. \$60,000. Evaluation of VeGain in pullet and early first cycle laying hens.
- 21) Persia, M.E. Private Contract. 2016-2017. \$91,350. Assessment of Hemicell HT® efficacy for improved feed utilization in laying hen production for EU registration.
- 22) Persia, M.E. Virginia Ag Council. 2016-2018. \$20,000. Evaluation of higher concentrations of butyric acid in broiler diets raised without antibiotics.

- 23) Persia, M.E., K.A. Livingston and J. Allen. American Egg Board – Egg Nutrition Center. 2015-2017. \$95,000. Vitamin D supplementation to laying hens may not only improve bird health, but human health as well.
- 24) Persia, M.E. Private Contract. 2015-2016. \$60,000. Effect of Vannix™ Formulas on the Performance and Health of Broilers.
- 25) Persia, M.E., R. Dalloul and N. Evens. Private Contract. 2015-2016. \$30,000. Effects of Lactoplan on live performance of broilers challenged with an avian E. coli and colonization of S. typhimurium during a short-term broiler chicken challenge model.
- 26) Persia, M.E. Private Contract. 2014-2015. \$25,000. Investigation of the nutritional and immune benefits of feeding a microbial protein product to laying hens.
- 27) Persia, M.E. Private Contract. 2014-2015. \$49,000. Comparison of the effect of 2 phytases on performance and bone parameters of broilers fed a negative control diet.
- 28) Persia, M.E. Private Contract. 2014-2015. \$48,000. Evaluation of the Valine and Tryptophan requirements of first cycle laying hens from 26 to 45 wk of age.
- 29) Persia, M.E. and R. Dalloul. Private Contract. 2014-2015. \$30,000. Impact of beta-glucan prebiotic on growth and immune performance of broilers.
- 30) Persia, M.E. 2013-2014. Private Contract. Effects of direct fed microbials on egg production persistency in late first cycle laying hens. \$47,000.
- 31) Persia, M.E. 2013-2014. Private Contract. Evaluation of feeding dietary flaxseed oil on egg yolk fatty acid content of first-cycle laying hens. \$20,000.
- 32) Persia, M.E. 2013-2014. Private Contract. Effects of enzyme supplementation on energy digestibility, performance and body composition of first-cycle laying hens fed various concentrations of dietary energy. \$50,000.
- 33) Persia, M.E. 2013-2104. Harold E. Ford Foundation. Industry Education Recruitment Funding. \$1,050.
- 34) Persia, M.E. 2013. Private Contract and IPRT. Evaluation of the choline utilization of a new product using a chick model and verification using commercial diets. \$19,915.
- 35) Noll, S.X. and M.E. Persia. 2012-2013. United Soybean Board. Improving turkey and broiler performance using soybean meal with a low oligosaccharide content. \$81,460 (ISU subcontract \$16,500).
- 36) Persia, M. E. 2012-2013. Private Contract. The effects of various OptiPhos supplementation levels on the performance of laying hens: Long term performance of commercial laying hens fed diets deficient in available phosphorus supplementation of different levels of OptiPhos or inorganic phosphate. \$80,094.
- 37) Persia, M. E. 2012-2013. Private Contract. Effect of varying levels of soy as a protein source in broiler diets and its effect on single enzyme efficacy or when fed in combination. \$50,010.

- 38) Persia, M. E. 2012-2013. Private Contract. Effect of varying levels of soy as a protein source in Broiler diets and its effect on enzyme efficacy on its own and in combination with DFMs. \$50,010.
- 39) Persia, M. E. 2012-2103. Harold E. Ford Foundation. Industry Education Recruitment Funding. \$1,995.
- 40) Persia, M. E. 2011-2012. Private Contract. Evaluation of feed efficiency in response to first-cycle laying hens fed diets containing dried distillers grains with solubles and supplemented with Tylan®. \$43,737.
- 41) Kerr, B. J., T. Weber and M. E. Persia. 2011-2012. Private Contract. Energy utilization of oil extracted-dried distillers grains with solubles (OE-DDGS) in swine and poultry. \$34,582.
- 42) Persia, M. E. 2011-2013. Private Contract. Effects of enzyme supplementation on broiler performance and other selected response parameters over multiple broiler flocks. \$90,000.
- 43) Persia, M. E. 2011-2012. Private Contract. Interactions of enzymes and DFMs in terms of digestibility and fibre disappearance at the ileal level in broilers. \$44,380.
- 44) Persia, M. E. 2011-2012. Private Contract. The effects of Hostazym enzyme supplementation on performance and nutrient digestibility of first-cycle laying hens fed various concentrations of dietary energy. \$46,405.
- 45) Persia, M. E. 2011-2102. Harold E. Ford Foundation. Industry Education Recruitment Funding. \$1,700.
- 46) Schmidt, C.J., C.M. Ashwell, S.J. Kemp, S.J. Lamont, M.E. Persia and M.F. Rothschild. 2011-2016. USDA-AFRI. Adapting Chicken Production to Climate Change through Breeding. \$4,707,445.
- 47) E.R. Benson, H. Xin, M.E. Persia, R. Alphin, and A. L. Johnson. 2011-2013. Quantitative Electroencephalography as an Indicator of Broiler and Layer Chicken Welfare Status during Exposure to Various Stressful Conditions. \$238,500.
- 48) Persia, M. E. 2011-2012. Rhodimet Research Grant. The effects of methionine status on broiler performance and physiologic responses to acute and chronic heat stress. \$71,675.
- 49) Persia, M. E. 2010-2011. Private Contract. Investigating the efficacy of Phytase A and a Competitor Phytase on the Performance, Bone Mineralisation and Nutrient Digestibility and Litter Parameters in Broiler Chickens Fed a Corn/Soy-Based Diet. \$60,000.
- 50) Persia, M. E. 2010-2011. Private Contract. Evaluation of energy enzymes in diets varying in energy on broiler growth performance and white meat yield. \$45,140.
- 51) Persia, M. E. 2010-2011. Private Contract and IPRT. The effects of direct fed microbial supplementation on broiler chicks exposed to a challenge dose of Coccivac vaccine to simulate a mild coccidiosis challenge followed by heat stress on bird performance, nutrient and endotoxin transport and intestinal mucin production. \$29,863.

- 52) Persia, M. E. 2010-2011. Private Contract. Feed (energy) restriction methodology to evaluate enzyme efficacy in laying hen diets. \$18,430.
- 53) Johnson, L., P. Murphy, M. E. Persia, T. Wang, S. Jung, and C. Glatz. 2010-2011. USDA – NIFA. Protein Utilization. IA: Advanced Soybean Refineries, Year 3. \$558,401 (\$60,693).
- 54) Xin, H., S. Millman, M. Ibarburu-Blanc, H. Li, M. E. Persia and B. Brehm-Stecher. 2010-2011. USDA-NIFA - Midwest Poultry Research Program. Evaluation of energy values of various oil sources when fed to poultry \$438,345 (\$30,000).
- 55) Persia, M.E. and B.J. Kerr. 2010-2011. Iowa Egg Council, Iowa Turkey Federation and Iowa Soybean board. Evaluation of energy values of various oil sources when fed to poultry (co-funding). \$7,500.
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