

## Elizabeth Bobeck, Ph.D.

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Appointment: B-base: 70% Research; 30% Teaching

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**POSITION RESPONSIBILITY STATEMENT**

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01/01/2016-CURRENT

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Dr. Bobeck's responsibility is to develop and maintain an independent and externally funded, nationally and internationally-recognized research program in poultry nutrition and management, including layers. This will be accomplished through use of modern research techniques and training of individuals to use these techniques to improve poultry production and health. This hypothesis-driven research will make basic scientific discoveries in nutrition and health in the mechanistic control of nutrient metabolism, immune function, and improved performance and health. The outcomes of research effort will be training of graduate students, application for competitive external research funding, timely publication of results in peer-reviewed scientific journals, and involvement in relevant scientific communities and societies. Dr. Bobeck will also contribute to undergraduate and graduate student instruction, curriculum and course development in nutrition, and related poultry biology and production systems. When Dr. Bobeck participates as an instructor in the Midwest Poultry Consortium Poultry Center of Excellence summer courses program, her efforts will be included in the 30% teaching effort of her 9-month appointment. Dr. Bobeck will also engage in undergraduate student advising. The division of effort is based on the appointment as 70% research and 30% teaching, respectively. This position does not have formal extension or outreach responsibilities other than those inherent to the research conducted. Involvement in professional and institutional service will be as needed and appropriate.

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## EDUCATION

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- Post-Doctoral Research Fellow, Department of Medical Microbiology & Immunology
  - University of Wisconsin-Madison; 2013-2015
  - Focus: Human Immunology, Hematopoietic, and Stem Cell Transplant Biology
- Post-Doctoral Research Associate, Department of Animal Science
  - Iowa State University; 2012-2013
  - Focus: Applied Poultry Nutrition
- Ph.D., Department of Animal Science
  - University of Wisconsin-Madison, 2007-2012
  - Focus: Poultry Nutrition and Nutritional Immunology
- B.S. Biology, Honors in Research
  - University of Wisconsin-Madison, 2003-2007

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## CURRENT POSITION: 2016-PRESENT

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- Assistant Professor, Department of Animal Science, Iowa State University
  - Research focus: Poultry nutrition, immunology, and welfare under two complementary, broad themes:
    - 1) Understanding the mechanisms by which diet and disease influence host immunobiology
      - Current and past projects:
        - Immunometabolism in primary poultry immune cells
        - Diet influence of immune populations and intestinal permeability
        - Mechanistic dissection of feed components and feed ingredient/ additive effect on immune function
        - Disease trajectory alterations through nutrition stimulation of immune system
        - Microbiome interaction with diet and immune function during disease
        - Omega 3 effect on laying hen and broiler bird immune response to LPS
        - Oil type and quality- immune inflammation outcomes in broilers
    - 2) Characterizing how poultry health, behavior, and welfare can be influenced through diet and management
      - Current and past projects:
        - Broiler environmental enrichment; behavior, welfare, and performance outcomes project
        - Distiller's dried grains with solubles digestibility and inclusion rate performance trial
        - Performance outcomes in soy and corn product combinations with varying digestibility
        - Omega 3 effect on laying hen and broiler bird bone health and performance
        - Oil type and quality- performance outcomes in broilers
        - Sustainable poultry production- outdoor poultry welfare, production, food safety, and husbandry in rotation with human food crops (broccoli, etc.)

- Responsible for developing curriculum and teaching: Poultry Science 223, Midwest Poultry Consortium AnS 314 Nutrition at UW-Madison (now, ISU), AnS 518, AnS 603
- Currently serving as Major Professor for two PhD students, 1 Master's student, and committee member for three graduate students (2 Ph.D., 1 MS)
- Graduated 3 Master's students
- 13 peer-reviewed publications, 26 abstracts
- 14 peer-reviewed extension articles
- 2 patents applied for
- Mentored 26 undergraduates in laboratory research and independent study
- Advise 15 undergraduate students

### EXPERIENCE PRIOR TO ISU

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- Post-doctoral Research Fellow, PI: Jenny E Gumperz, Department of Medical Microbiology and Immunology. University of Wisconsin-Madison, 2013-2015.
  - Research Topic: Influence of invariant Natural Killer T cells (iNKT) on human hematopoiesis and post-transplantation engraftment, identification of novel lipids and lipid mediators recognized by iNKT cells, and nutritional immunology; influence of dietary lipid intake on NKT cell recognition and activation. Developed model of human cord transplant into immunodeficient NSG mice for the study and improvement of hematopoiesis outcomes in human patients requiring immune reconstitution.
    - Mentored and trained 4 undergraduate students in lab tasks and research support of my project
    - Two manuscripts currently submitted and under review; delayed after postdoc period to conduct additional studies to add reviewer-requested data to the manuscripts
- Post-doctoral Research Associate, PI: Mike Persia, Department of Animal Science, Iowa State University, 2012-2013.
  - Research Topic: Dietary (lipid, vitamin, mineral) manipulation of growth, bone density, and intestinal health in broiler chickens and laying hens.
    - 3 papers published
- Graduate Research Assistant, PI: Mark E. Cook, Animal Science Department, University of Wisconsin-Madison, 2007-2012.
  - Research Topic: Development of oral antibodies against intestinal targets involved in phosphate uptake and absorption as an alternative non-drug therapy for human patients with chronic kidney disease; Development of avian antibodies against other targets of interest for purposes ranging from novel immunoassays for avian systems, to improvement of growth and development in livestock.
    - Mentored 14 undergraduates on independent research projects during graduate career.
    - Published 6 papers
    - Applied for and was granted one patent (2012-2015).
- Wisconsin Alumni Research Foundation Ambassador; Identification of patentable projects/intellectual property in research labs on UW-Madison campus. Education of graduate students and post-docs about intellectual property and patentability; 2010-2012.

- Teaching Assistant; Animal Science 101, Avian Physiology 203, Avian Health 512; Conducted research on the ability of undergraduate students to learn class material and develop opinions over the course of a semester, see published paper below (2014).

### AFFILIATIONS/MEMBERSHIPS

- Gamma Sigma Delta, ISU Chapter President 2019-2020, Vice President 2018-2019, member 2016-present
- Sigma Xi, member 2018-present
- Poultry Science Association, annual meeting session chair 2019, abstract reviewer 2016-present, member 2007-present
- Iowa Turkey Federation, ex-officio board member 2016-present
- World's Poultry Science Association, member 2008-present
- American Society of Animal Science, member 2011-2013
- University of Wisconsin-Madison Postdoctoral Association, member 2013-2015
- Iowa State University Postdoctoral Association, member 2012-2013
- American Society for Nutrition, member 2009-2012

### ASSISTANT PROFESSOR: PUBLICATIONS [N=13; N=10 AS FIRST OR LAST AUTHOR]

**Dr. Bobeck (Kraayenbrink) publishes solely under her maiden name of Bobeck, and can be found in literature searches as EA Bobeck, E.A. Bobeck, or E. Bobeck. Patents are held both under EA Bobeck and EA Kraayenbrink (legal name).**

*Impact factor: The ISI impact factors are current and may be variable over time.*

*\*Notation placed by student name where I was major/co-major professor or direct supervisor.*

*#Notation on publications placed by name, I served as corresponding author.*

1. M Meyer\*, **EA Bobeck**, Y Sato, and M El-Gazzar. 2021. Comparison of naturally-occurring versus experimental infection of *Staphylococcus aureus* septicemia in Laying Hens in two different age groups. *Avian Diseases*. doi: 10.1637/aviandiseases-D-20-00118. 5 year impact factor: 1.547. Journal Rank: 43/141: Veterinary Sciences. *Role: My lab collaborated with Dr Sato and Dr. El-Gazzar from ISU Veterinary Medicine to understand impact of a wild type staph infection based on inoculation route and hen age. We did not recreate disease found in field case but noted differences in inoculation impact based on age and route. A separate publication outlining immune impacts has been submitted as of 2021.*
2. KA Fries-Craft\*, SC Lindblom, BJ Kerr, and **EA Bobeck**<sup>#</sup>. 2021. Lipid source and peroxidation status alter immune cell recruitment in broiler chicken ileum. *J Nutrition*. (1): 223-234. doi: 10.1093/jn/nxaa356. 5 year Impact Factor: 5.075. Journal Rank: 20/89: Nutrition and Dietetics. *Role: My lab designed and implemented a novel way to determine influence of varying types of raw or cooked oils on inflammation in the digestive tract of broilers. We were responsible for sample collection, preparation, data analysis, and outcome interpretation. We worked in collaboration with Dr Brian Kerr and this publication is related to #10 below. Significance: We showed differential effects of cooking oils on recruitment of immune cells in broilers and were the first to use RNAscope technology to do so.*
3. KA Fries-Craft\*, JM Anast, S Schmitz-Esser, and **EA Bobeck**<sup>#</sup>. 2020. Host immunity and the colon microbiota of mice infected with *Citrobacter rodentium* are beneficially modulated by lipid-soluble

- extract from late-cutting alfalfa in the early stages of infection. *PLOS One*, July 16, 2020. <https://doi.org/10.1371/journal.pone.0236106>. 5 year Impact Factor: 3.337. Journal Rank: 24/69: Multidisciplinary Sciences. *Role*: My lab worked with SSE to design the study, and we executed the study as well as collected samples, ran diagnostic assays, and analyzed data. SSE and JMA assisted with microbiome work and we completed performance and immunology data. KFC completed this work for her MS degree. *Percent effort*: 80%. *Significance*: We were able to show that both alfalfa cutting (early or late) and type of extract (water or fat soluble) impacted the outcome of a pathogen inoculation in mice in terms of pathogen clearance, severity of inoculation, and immune response. We applied for a provisional patent with the results in March 2020. This work shows teamwork and collaboration in respective fields of expertise within the animal science department.
4. JL Maki, **EA Bobeck**, MJ Sylte, and T Looft. 2020. Eggshell and environmental bacteria contribute to the intestinal microbiota of growing chickens. *J An Sci Biotech*. 11(60). <https://doi.org/10.1186/s40104-020-00459-w>. 5 year Impact Factor: 3.470. Journal Rank: 2/61: Agriculture, Dairy, and Animal Science. *Role*: My lab provided the fertile eggs and eggshell cleanliness conditions for running the experiment, as well as experimental design and paper writing/review. *Percent effort*: 20% EB, 80% MS, TL and JM. *Significance*: This paper is one of the first to show eggshell microbial biodiversity alters poultry intestinal microflora using gnotobiotic chambers. It also shows collaboration with groups outside ISU (USDA-ARS).
  5. **EA Bobeck**<sup>#</sup>. 2020. Functional nutrition in livestock and companion animals to modulate the immune response. *J Anim Sci*. 98(3). <https://doi.org/10.1093/jas/skaa035>. 5 year Impact Factor: 2.155. Journal Rank: 16/61: Agriculture, Dairy, and Animal Science. *Role*: This is a conference paper from an invited lecture at the 2019 Animal Science Meetings in Austin, TX. 100% conceptualized, written, and edited by EB. *Significance*: This review discusses ways that nutrition can alter immune responses in animals, a hot topic in both livestock and companion animal nutrition.
  6. MM Meyer\*, KA Fries-Craft\*, and **EA Bobeck**<sup>#</sup>. 2020. Composition and inclusion of probiotics in broiler diets alter intestinal permeability and spleen immune cell profiles without negatively affecting performance. *J Anim Sci*. 98(1). doi: 10.1093/jas/skz383. 5 year Impact Factor: 2.155. Journal Rank 16/61: Agriculture, Dairy, and Animal Science. *Supervision*: Ms. Meyer and Ms. Fries-Craft both were Master's students under my supervision and equally contributed to the work. *Percent effort*: 60%. *Significance*: This paper is one of the first to report in birds differential effects of probiotic composition and dietary inclusion rate on immune cell populations.
  7. MM Meyer\*, AK Johnson, and **EA Bobeck**<sup>#</sup>. 2020. A novel environmental enrichment device increased physical activity and walking distance in broilers. *Poult Sci*. 99(1): 48-60. doi:10.3382/ps/pez581. 5 year Impact Factor: 2.537. Journal Rank: 8/61: Agriculture, Dairy, and Animal Science. *Role*: This paper represents behavior and welfare outcomes from a novel environmental enrichment device we developed and patented. Editing was done as a joint effort between Dr. Johnson and myself. *Percent effort*: 60%. *Significance*: This paper is the first to outline an environmental enrichment device that improves walking distance and behavior outcomes in growing broilers without negatively affecting welfare measures. *Supervision*: Ms. Meyer is my Master's student and this paper was submitted as part of her thesis work.
  8. KA Fries\* and **EA Bobeck**<sup>#</sup>. 2019. Evaluation of a High Protein DDGS Product in Broiler Chickens: Performance, Nitrogen-Corrected Apparent metabolizable energy, and standardized ileal amino acid digestibility. *Br Poult Sci*. 60(6):749-756. doi: 10.1080/00071668.2019.1652884. 5 year Impact Factor: 1.587. Journal Rank: 21/61: Agriculture, Dairy, and Animal Science. *Role*: I was 100% responsible for industry funding, project conceptualization and experimental design, supporting writing and of paper, which was completed by student. *Percent effort*: 80%. *Significance*: This work describes a new high-protein DDGS product in the poultry industry from an energy and protein basis



to be used in feeding guidelines. Supervision: Ms. Fries is my Master's student, and this was part of her graduate MS work.

9. MM Meyer\*, AK Johnson, and **EA Bobeck**<sup>#</sup>. 2019. A novel environmental enrichment device improved broiler performance without sacrificing bird physiological or environmental quality measures. *Poult Sci.* 98(11): 5247-5256. doi: 10.3382/ps/pez417. 5 year Impact Factor: 2.537. Journal Rank: 8/61: Agriculture, Dairy, and Animal Science. *Role*: This paper represents methods we used for her graduate project, which was an idea I conceptualized and brought to Dr. Johnson for help in welfare outcomes. Editing was done as a joint effort between Dr. Johnson and myself. Percent effort: 60%. *Significance*: This paper is the first to outline an environmental enrichment device that improves performance outcomes in growing broilers without negatively affecting welfare or environmental measures. It is the only enrichment option of its kind to improve performance and this is significant for industry. Supervision: Ms. Meyer is my Master's student and this paper was submitted as part of her thesis work.
10. MM Meyer\*, AK Johnson, and **EA Bobeck**<sup>#</sup>. 2019. Development and validation of broiler welfare assessment methods for research and on-farm audits. *J Anim Welf Sci.* doi: 10.1080/10888705.2019.1678039. 5 year Impact factor: 1.391. Journal Rank: 56/141: Veterinary Sciences. *Role*: This paper represents methods we used for her graduate project, which was an idea I conceptualized and brought to Dr. Johnson for help in welfare outcomes. Editing was done as a joint effort between Dr. Johnson and myself. Percent effort: 60%. *Significance*: This paper is the first to outline methods for quantifying welfare outcomes in broiler chickens and poultry in general, and give suggestions for use in industry and academics. Supervision: Ms. Meyer is my Master's student and this paper was part of her thesis work.
11. SC Lindblom, NK Gabler, **EA Bobeck**, and BJ Kerr. 2018. Oil source and peroxidation status interactively affect growth performance and oxidative status in broilers from 4 to 25 d of age. *Poult Sci.* <https://doi.org/10.3382/ps/pey547> 5 year Impact Factor: 2.537. Journal Rank 8/61: Agriculture, Dairy, and Animal Science. *Role*: I was responsible for formulating and mixing diets for this project that was spearheaded by BJK. I helped during the trial, including data collection and sample collection. I reviewed the data and manuscript. 20% total effort. *Significance*: This paper represents the performance impact of feeding heat-modified oils to broilers, a common feedstuff in industry, and reports negative performance and peroxidation status impact due to heating.
12. IJ Ehr\*, ME Persia, and **EA Bobeck**<sup>#</sup>. 2017. Comparative omega-3 fatty acid enrichment of egg yolks from first-cycle laying hens fed flaxseed oil or ground flaxseed. *Poult Sci.* 96(6):1791-1799. doi: 10.3382/ps/pew462. 5 year Impact Factor: 2.537. Journal Rank: 8/61: Agriculture, Dairy, and Animal Science. *Role*: This work was completed prior to me taking over IJ Ehr on as a MS student, but the writing and publication was done after he moved to my lab. 80% effort writing/revising/data analysis/publication. *Significance*: This paper outlines the transfer efficiency of omega-3 fortified ingredients in hen diets. It is the first to report the energy content of flaxseed oil and transfer ability of two omega-3 supplements. Supervised: IJ Ehr, MS student.
13. **EA Bobeck**, ML Piccione, JW Bishop, TG Fulmer, DJ Schwahn, C Helvig, M Petkovich, and ME Cook. 2017. Adenine-induced hyperphosphatemia in a murine model of renal insufficiency. *Nephrol Renal Dis.* 2(3): 1-7. doi:10.15761/NRD.1000126. 5 year Impact Factor: 1.2. *Role*: This paper represents work done during my PhD. Experimental work was completed at UW-Madison, but paper was written/revised/published while I was at ISU. 90% effort. *Significance*: This paper is the first to describe model flaws, outline changes to feed intake/gain due to adenine supplementation, and suggests improvements in a commonly used chemical model of renal injury in a murine model.

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**PUBLICATIONS PRIOR TO ISU [N=9, ALL AS FIRST OR LAST AUTHOR]**

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1. **EA Bobeck**, E Hellestad, C Helvig, M Petkovich, and M.E. Cook. 2015. Oral antibodies to human intestinal alkaline phosphatase reduce dietary phytate phosphate bioavailability in the presence of dietary 1 $\alpha$ -hydroxycholecalciferol. *Poult Sci.* 95(3): 570-580. <http://dx.doi.org/10.3382/ps/pev341>. 5 year Impact Factor: 2.537. Journal Rank: 8/61: Agriculture, Dairy, and Animal Science. *Role: This paper represents work done during my PhD. Experiment, data collection, statistics, and all writing work was completed at UW-Madison. 90% overall effort. Significance: This paper is the first to describe a novel, hen egg-antibody-based non-pharmaceutical method of reducing phosphate burden during chronic kidney failure. It outlines the ability to make an antibody to an enzyme, a method previously thought to be impossible.*
2. **EA Bobeck**, E Hellestad, ML Piccione, JW Bishop, TG Fulmer, C Helvig, M Petkovich, and ME Cook. 2015. Oral administration of an antibody to intestinal sodium-dependent phosphate co-transporter-2b reduces dietary phosphate absorption. *Poult Sci.* 94(6): 1128-1137. <http://dx.doi.org/10.3382/ps/pev085>. 5 year Impact Factor: 2.537. Journal Rank: 8/61: Agriculture, Dairy, and Animal Science. *Role: This paper represents work done during my PhD. Experiment, data collection, data analysis, and writing work was completed at UW-Madison. 90% effort. Significance: This paper is the first to describe a novel, hen egg-antibody-based non-pharmaceutical method of reducing phosphate burden during chronic kidney failure.*
3. **EA Bobeck**, NA Nachtrieb, AB Batal, and ME 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. <http://dx.doi.org/10.3382/japr.2013-00841>. 5 year Impact Factor: 1.398. Rank: 41/61: Agriculture, Dairy, and Animal Science. *Role: This paper represents work done during my post-doc at ISU. Experiment, data collection, data analysis, and all writing work was completed at ISU during my post-doc. 90% effort. Significance: This paper outlines an enzyme that can be used in reduced-energy diets to reduce diet cost. The enzyme improves energy availability in an energy-deficient diet as compared to energy-replete control, and is of direct interest to industry.*
4. **EA Bobeck**, DK Combs, and ME Cook. 2014. Introductory animal science-based instruction influences attitudes on animal agriculture issues. *J Anim Sci.* 92:856-864. 5 year Impact Factor: 1.714. Rank: 12/60 Agriculture, Dairy, and Animal Science. *Role: This paper represents work done during my PhD at UW-Madison. Experimental design, survey administration, data collection and analysis, and all writing/revision was completed at UW-Madison. This paper is the basis for current research being conducted in my lab regarding poultry-specific welfare concerns. 90% effort. Significance: This paper highlights how science-based animal science education can change perception of the livestock industry as well as welfare outcomes.*
5. ME Persia, M Higgins, T Wang, D Trample, and **EA Bobeck**. 2013. Effects of long-term supplementation of laying hens with high concentrations of cholecalciferol on performance and egg quality. *Poult Sci.* 92(11): 2930-2937. 5 year Impact Factor: 2.537. Journal Rank: 8/61: Agriculture, Dairy, and Animal Science. *Role: This paper represents work done during my post-doc at ISU. Experimental and all writing work was completed at ISU. I was involved in data compilation, analysis, and writing. 60% effort. Significance: Laying hen diets are being supplemented for value added products for human consumption, and this paper outlines feeding rates to achieve varying levels of vitamin D in the egg yolk.*
6. **EA Bobeck**, R Payne, BJ Kerr, and ME Persia. 2013. Supplemental lysine sulfate does not negatively affect performance of broiler chicks fed dietary sulfur from multiple dietary and water sources. *J Appl Poult Res.* 22(3): 461-468. 5 year Impact Factor: 1.398. Rank: 41/61: Agriculture, Dairy, and Animal Science. *Role: This paper represents work done during my post-doc at ISU. Experiment, data analysis, and writing work was completed at ISU. I was involved in data compilation, analysis, and*

writing. 60% effort. Significance: Sulfur is a contaminant in ground water in Iowa, and this paper highlights that multiple sources of sulfur (diet and water) do not significantly affect broiler performance.

7. **EA Bobeck**, KM Meyer, C Helvig, M Petkovich, and ME Cook. 2013. Sevelamer hydrochloride binds phosphate released from phytate in chicks fed 1 $\alpha$ -hydroxy cholecalciferol. *J Ren Nutr*, 21(1): 21-27, PMID 22406121. 5 year Impact Factor: 2.651. Rank: 44/83 Nutrition and Dietetics; 25/76 Urology and Nephrology. Role: *This paper represents work done during my PhD. Experiment, data analysis, and all writing work was completed at UW-Madison. 90% effort. Significance: This paper is the first to report that a long-ignored source of dietary phosphorus in human diets (phytate phosphorus) is able to be bound and excreted by a commonly used end-stage renal disease medication (sevelamer). This source of phosphorus is generally not accommodated for when prescribing low P diets, and concurrent vitamin D administration makes this source available, which could result in phosphorus burden on the kidneys if sevelamer did not remove it from the gastrointestinal tract.*
8. **EA Bobeck**, K Burgess, T Jarnes, ML Piccione, and ME Cook. 2012. Maternally-derived antibody to fibroblast growth factor-23 reduced dietary phosphate requirements in growing chicks. *Biochem Biophys Res Comm*. 420: 666–670. 5 year Impact Factor: 2.251. Rank: 170/293: Biochemistry and Molecular Biology. Role: *This paper represents work done during my PhD. Experiment, data collection, and all writing work was completed at UW-Madison. 90% effort. Significance: This project was my idea based on metabolic control of phosphorus. It was the first to describe that whole-animal (progeny) phosphorus homeostasis could be altered by providing a maternal vaccine. Chicks from vaccinated hens could be fed a phosphorus deficient diet and grow normally, and this observation resulted in a patent (see p9 CV).*
9. **EA Bobeck** and ME Cook. 2005. Heat stability of *Gallus domesticus* Immunoglobulin Y (IgY). *Wisconsin J Sci*. 1: 25-28. Role: *This paper represents an independent project done during my undergraduate research at UW-Madison. Experimental design, data analysis, and all writing work was completed at UW-Madison and submitted to an undergraduate peer-reviewed journal. 100% effort. Significance: This work describes methods to heat stabilize egg yolk antibody, which is necessary during pelleting processes for feed. It was the first to report that moisture played a larger role in antibody degradation than heat.*

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#### ASSISTANT PROFESSOR: MANUSCRIPTS UNDER REVIEW [N=1]

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1. NJ Hess, **EA Bobeck**, NS Bharadwaj, N Zumwalde, C McDougal, S Ma, JD Sauer, AW Hudson, and J Gumperz. 2020. iNKT-immunotherapy stabilizes cord blood engraftment by promoting monocyte PGE<sub>2</sub> secretion. Submitted to JCI Insight, 4/2020. 5 year Impact Factor: 6.014. Journal Rank 14/136: Medicine, Research, and Experimental Science. Role: *The work for this paper was done while I was at UW-Madison completing my post-doc with Dr. Jenny Gumperz. The work was continued by NJ Hess once I joined ISU faculty in 2016. The data compilation and writing was done while at ISU. The paper is 50% my effort, including data collection and writing with Dr. Gumperz and other collaborators providing supporting detail. Significance: This paper is the first to describe that iNKT cells stabilize umbilical cord engraftments through promoting secretion of PGE<sub>2</sub> by monocytes. This relationship has yet to be described in the literature and the application is helping sub-optimal hematopoietic stem cell engraftment in cancer or chemotherapy patients.*

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#### ASSISTANT PROFESSOR: PATENTS [N=2]

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1. KA Fries-Craft, S Schmitz-Esser, and **EA Kraayenbrink**. Provisional patent: ISURF # 04994 - 5th Cutting Chloroform Alfalfa Extract. Provisional patent applied for March 2020, full in March 2021.

KFC and EAK developed an alfalfa extract that improves immunity, alters immune cell profile, and alters microbiome (SSE).

2. **EA Kraayenbrink**, AK Butters-Johnson, and DJ Kraayenbrink. Patent: Laser Enrichment Device, System, and Method for Poultry. Provisional patent filed October 2018. Full patent submitted October 2019. DJK and EAK made independent observations about chick behavior leading to EAK approaching AKJ about collaborating on a broiler behavior project that eventually lead to this patent application.

#### PATENTS PRIOR TO ISU [N=1]

1. ME Cook, **EA Bobeck**, and KJ Burgess. Peptide and method for reducing the phosphate requirement and excretion from farm animals. US Patent Application filed 2013, granted in June 2015. This patent was granted from my graduate PhD work. I came up with the idea for the antibody, as well as the targets, and the animal trial. ME Cook was my graduate mentor at the time, and KJ Burgess was an undergraduate who helped with animal experimentation.

#### ASSISTANT PROFESSOR: ABSTRACTS [N=26, N=23 as first or last author]

1. KA Fries-Craft\*, MM Meyer\*, Y Sato, M El-Gazzar, and **EA Bobeck**<sup>#</sup>. 2020. Age and route of infection with *Staphylococcus aureus* elicit differential responses in laying hen immune cell profiles measured by flow cytometry. Submitted and accepted to World's Poultry Science to be presented August 2020 in Paris, France. Conference was postponed to 2021 due to COVID-19.
2. MM Meyer\*, M El-Gazzar, Y Sato, and **EA Bobeck**<sup>#</sup>. 2020. A *Staphylococcus aureus* infection hindered spare respiratory capacity of commercial laying hen immune cells measured using a metabolic assay. Submitted and accepted to World's Poultry Science to be presented August 2020 in Paris, France. Conference was postponed to 2021 due to COVID-19.
3. KA Fries-Craft\* and **EA Bobeck**<sup>#</sup>. 2020. Algae-based feed ingredient improves intestinal physiology and alters systemic immunity in broiler chickens during coccidiosis. (Poultry Science Association Annual Meeting. Louisville, KY. Moved online due to COVID-19).
4. MM Meyer\* and **EA Bobeck**<sup>#</sup>. 2020. An algae-derived feed ingredient positively impacted broiler growth performance in the grower phase but did not alter intestinal integrity. (Poultry Science Association Annual Meeting. Louisville, KY. Moved online due to COVID-19).
5. MM Meyer\*, AK Johnson, and **EA Bobeck**<sup>#</sup>. 2020. Broiler laser enrichment stimulated laser-following behavior and indirectly increased proportion of birds moving. (Poultry Science Association Annual Meeting. Louisville, KY. Moved online due to COVID-19).
6. C Spencer\*, KA Fries-Craft\*, and **EA Bobeck**<sup>#</sup>. 2019. Examining changes to intestinal morphology in broiler chickens in response to an algae-based feed additive in a model of coccidiosis. (2019 Fall Science with Practice Symposium, Iowa State University, Ames, IA).
7. M Barkley\*, MM Meyer\*, AK Johnson, and **EA Bobeck**<sup>#</sup>. 2019. Measuring latency to feed of broilers after exposure to an environmental enrichment device. (Senior Honors Project, Iowa State University Honors Program, Ames, IA).
8. MM Meyer\*, AK Johnson, and **EA Bobeck**<sup>#</sup>. 2019. A unique form of environmental enrichment motivated broiler physical activity and maintained tibia quality. (Poultry Science Association Annual Meeting, Montreal, Quebec).
9. **EA Bobeck**<sup>#</sup>, MM Meyer\*, and AK Johnson. 2019. Broiler enrichment: Welfare and performance benefits. Elizabeth A. Bobeck, Meaghan M. Meyer, Anna K. Johnson. (Poultry Science Association Annual Meeting, Montreal, Quebec).

10. MM Meyer\*, AK Johnson, and **EA Bobeck**<sup>#</sup>. 2019. Methods to evaluate broiler welfare and environmental enrichment for research and on-farm audits. (Poultry Science Association Annual Meeting, Montreal, Quebec).
11. KA Fries-Craft\* and **EA Bobeck**<sup>#</sup>. 2019. Probiotic supplementation reduces intestinal permeability and alters splenic immune cell populations without altering performance in healthy broilers. (Poultry Science Association Annual Meeting, Montreal, Quebec).
12. JJ Maki, MJ Sylte, **EA Bobeck**, and T Looft. 2019. Impact of Eggshell Microbes on the Succession, Establishment, and Function of the Poultry Intestinal Microbiota. (American Society for Microbiology: Microbe Conference, San Francisco, CA).
13. KA Fries-Craft, J Anast, S Schmitz-Esser, and **EA Bobeck**<sup>#</sup>. 2019. Responses to alfalfa supplementation in mice. (Midwest American Society of Animal Science Conference, Omaha, NE).
14. MM Meyer and **EA Bobeck**<sup>#</sup>. 2019. Responses of undergraduate students pre- and post-education on poultry industry and welfare issues. (Midwest American Society of Animal Science Conference, Omaha, NE).
15. **EA Bobeck**<sup>#</sup>. 2018. Divergent cellular fuel preferences in primary immune cells isolated from commercial type laying hens and broilers. (Poultry Science Association Annual Meeting, San Antonio, TX).
16. KA Fries\*, Meyer MM\*, Kerr BJ, and **EA Bobeck**<sup>#</sup>. 2018. Dietary peroxidized lipids alter immune cell recruitment in broilers. (Poultry Science Association Annual Meeting, San Antonio, TX).
17. KA Fries\* and **EA Bobeck**<sup>#</sup>. 2018. Optimization of aqueous and lipid-soluble extraction methods for alfalfa (*Medicago sativa*). (Midwest American Society of Animal Science Conference, Omaha, NE).
18. MM Meyer\*, \* JC Jespersen\*, and **EA Bobeck**<sup>#</sup>. 2018. Metabolic capacity comparison of laying hen and broiler line isolated peripheral blood mononuclear cells. (ASAS Midwest Meeting, Omaha, NE).
19. MM Meyer\*, JC Jespersen\*, and **EA Bobeck**<sup>#</sup>. 2018. Baseline metabolic capacity comparison of peripheral blood mononuclear cells from multiple chicken genetic lines. (PSA Annual Meeting, San Antonio, Texas).
20. CR Gregg\*, K Fries\*, and **EA Bobeck**<sup>#</sup>. 2018. Development of a Diagnostic Assay to test interleukin-4 concentration in hen serum. Science With Practice Spring Research Symposium, Iowa State University, Ames, IA.
21. JC Jespersen\*, MM Meyer\*, AK Johnson, and **EA Bobeck**<sup>#</sup>. 2018. Novel Enrichment Methods to Reduce Leg Lameness in Broilers. Presented at ISU Science with Practice Spring Symposium, Ames, IA.
22. MM Meyer\*, L Koester, S Schmitz-Esser, and **EA Bobeck**<sup>#</sup>. Determining intestinal bacterial colonization in pre-hatch chicken embryos. 2017. Presented at ISU Science with Practice Spring Symposium, Ames, IA.
23. SC Lindblom, **EA Bobeck**, and BJ Kerr. 2017. Effect of oil source and quality on broiler performance and oxidative status. *Poult. Sci.* 96 (E-Suppl. 1) p. 273. Presented at International Poultry Products Expo, Atlanta, Georgia.
24. MM Meyer\*, \* JJ Jespersen\*, and **EA Bobeck**<sup>#</sup>. 2017. Optimization of a Metabolic Assay in Laying Hen Peripheral Blood Mononuclear Cells. Presented at the Iowa Egg Industry Symposium, Ames, IA.
25. IJ Ehr\*, S Azarpajouh, **EA Bobeck**<sup>#</sup>, B Kerr, C Morris, K Stalder, N Gabler and AK Johnson. 2016. The effects of dietary omega-3 fatty acids ( $\omega$ -3) on commercial broiler bird bone health. Proceedings of the Poultry Science Association 105<sup>th</sup> Annual Meeting. 95:31.

26. JC Jespersen\*, I Ehr\*, C Morris, B Kerr, A Johnson, N Gabler, and **EA Bobeck**<sup>#</sup>. 2016. Dietary omega-3 fatty acids ( $\omega$ -3) did not attenuate performance during sustained inflammation on commercial broilers. *Proceedings of the Poultry Science Association 105<sup>th</sup> Annual Meeting*. 95:19.

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#### ABSTRACTS PRIOR TO ISU [N=11, N=10 AS FIRST AUTHOR]

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1. **EA Bobeck**, LE Felley, and JE Gumperz. 2015. iNKT cells improve human umbilical cord cell engraftment in an NSG model of transplant hematopoiesis. (CD1-MR1 International Conference, Lorne, VIC, Australia.)
2. **EA Bobeck**, X Xu, and JE Gumperz. 2014. Pleiotropic effects of human NKT cells on hematopoiesis. (Autumn Immunology Conference, Chicago, Illinois.)
3. **EA Bobeck**, W Hallett, X Xu, R Zarnowski, J Yang, B Hammock, and JE Gumperz. 2014. NKT cells influence hematopoiesis through differential mechanisms. (WI Stem Cell Symposium, Madison, WI.)
4. **EA Bobeck**, K Burgess, T Jarmes, ML Piccione, and ME Cook. 2012. FGF-23 neutralization through vaccination reduced phosphate requirements of chickens. (Poultry Science Association Annual Meeting, Athens, Georgia).
5. **EA Bobeck**, DK Combs, and ME Cook. 2011. Opinions of farm vs. urban freshman college students on issues involving animal agriculture before and after animal science instruction. T420. *J Anim Sci*, Volume 89, E-Supplement 1. (Animal Science/ Dairy Science Joint Annual Meeting, New Orleans, LA).
6. VA Leone, D Haughey, **EA Bobeck**, ME Cook, and FM Assadi-Porter. 2011. Evidence that maternal conjugated linoleic acid alters secondary metabolites in plasma of late-stage chick embryos that may lead to increased embryonic mortality. *J Anim Sci* 89, E-suppl: 357. (Animal Science/ Dairy Science Joint Annual Meeting, New Orleans, LA).
7. **EA Bobeck**, and ME Cook. 2010. Phosphate-dependent physiological changes during short-term dietary phosphorus deficiency with or without a dietary phosphorus binder. *FASEB J* April 6, 2010 24:917.22 (Experimental Biology Meetings, Anaheim, CA.)
8. **EA Bobeck**, and ME Cook. 2009. Dietary sevelamer hydrochloride prevents dietary 1-alpha hydroxycholecalciferol (1 alpha-OH D<sub>3</sub>)-induced increases in plasma phosphorus. *FASEB J* April 22, 2009 23:909.6. (Experimental Biology Meetings, New Orleans, LA.)
9. **EA Bobeck**, CL Cook, BE Gelbach, M Yang, and ME Cook. 2008. Thermoprotection of bioactive proteins added to animal feed. *World's Poult Sci J* 64, supplement 2: 199.
10. **EA Bobeck**, CL Cook, BE Gelbach, M Yang, and ME Cook. 2008. Thermoprotection of Bioactive Proteins Added to Animal Feed. *FeedInfo News Service Scie Rev*. Available from URL: <http://www.feedinfo.com>.
11. **EA Bobeck**, DL Trott, M Yang, and ME Cook. 2006. Methods in Heat Stabilization of *Gallus domesticus* Immunoglobulin Y (IgY). *Poultry Science* 85: supplement 1. (Poultry Science Association Annual Meeting, Edmonton, Canada.)

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#### ASSISTANT PROFESSOR: PEER REVIEWED EXTENSION PUBLICATIONS [N=14, N=12 AS FIRST OR LAST AUTHOR]

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1. Bilenky M, Nair A, Shaw S, and **EA Bobeck**. (2021). Integrating poultry into an organic vegetable cropping system: benefits, challenges, and considerations. *ISU Extension and Outreach*. <https://store.extension.iastate.edu/product/16041>
2. Meyer MM\* and **EA Bobeck**. (2021). Dietary probiotics alter broiler intestinal permeability parameters but not performance, *Iowa State University Animal Industry Report* 17(1). doi: <https://doi.org/10.31274/air.11541>



3. Fries-Craft K\*, MM Meyer\*, and **EA Bobeck**. (2021). Baseline Immune Cell Composition in Broiler Spleen is Altered by Probiotic Supplementation, *Iowa State University Animal Industry Report* 17(1). doi: <https://doi.org/10.31274/air.11540>
4. Fries-Craft K\*, BJ Kerr, and **EA Bobeck**. (2021). Immune cell populations in the broiler ileum exhibit differential cytokine profiles in response to lipid source and peroxidation, *Iowa State University Animal Industry Report* 17(1). doi: <https://doi.org/10.31274/air.11909>
5. Fries-Craft K\*, J Anast, S Schmitz-Esser, and **EA Bobeck**. (2021). Late-cutting lipid-soluble alfalfa extract beneficially modulates the colon microbiota to protect mouse body weight during *Citrobacter rodentium* challenge, *Iowa State University Animal Industry Report* 17(1). doi: <https://doi.org/10.31274/air.11911>
6. MM Meyer\*, AK Johnson, and **EA Bobeck**<sup>#</sup>. (2019). Methods validated in a research setting including modifications for producers to measure on-farm commercial broiler welfare. *Iowa State University Animal Industry Report* Available at: <https://www.iastatedigitalpress.com/air/article/id/7186/>
7. MM Meyer\*, AK Johnson, and **EA Bobeck**<sup>#</sup>. (2019). Novel walking lameness platform to assess lameness in broilers. *Iowa State University Animal Industry Report* . Available at: <https://www.iastatedigitalpress.com/air/article/id/7185/>
8. MM Meyer\*, AK Johnson, and **EA Bobeck**<sup>#</sup>. (2019). Validated broiler welfare measures recommended to researchers. *Iowa State University Animal Industry Report* Available at: <https://www.iastatedigitalpress.com/air/article/id/7187/>
9. KA Fries\* and **EA Bobeck**<sup>#</sup>. (2018). Energy Digestibility of a High Protein DDGS Product in Broilers, *Iowa State University Animal Industry Report* : AS 664, ASL R3257. Available at: [https://lib.dr.iastate.edu/ans\\_air/vol664/iss1/55](https://lib.dr.iastate.edu/ans_air/vol664/iss1/55)
10. KA Fries\* and **EA Bobeck**<sup>#</sup>. (2018). Evaluation of a High Protein DDGS Product on Broiler Performance, *Iowa State University Animal Industry Report* : AS 664, ASL R3258. Available at: [https://lib.dr.iastate.edu/ans\\_air/vol664/iss1/56](https://lib.dr.iastate.edu/ans_air/vol664/iss1/56)
11. KA Fries\* and **EA Bobeck**<sup>#</sup>. (2018). Amino Acid Digestibility of a High Protein DDGS Product in Broilers, *Iowa State University Animal Industry Report* : AS 664, ASL R3256. Available at: [https://lib.dr.iastate.edu/ans\\_air/vol664/iss1/54](https://lib.dr.iastate.edu/ans_air/vol664/iss1/54)
12. MM Meyer\*, L Koester, Lucas; S Schmitz-Esser, and **EA Bobeck**<sup>#</sup>. (2018). Determining Presence of Yolk Sac and Intestinal Bacterial Colonization in Pre-hatch Chicken Embryos, *Iowa State University Animal Industry Report* : AS 664, ASL R3259. Available at: [https://lib.dr.iastate.edu/ans\\_air/vol664/iss1/57](https://lib.dr.iastate.edu/ans_air/vol664/iss1/57)
13. E Akin, Z Kiefer, A Rangel, IJ Ehr\*, A Azarpajouh, **EA Bobeck**, AK Johnson, N Gabler, K Stalder, and B Kerr. (2017). The Effects of Dietary Omega 3 Fatty Acids on Commercial Broiler Behavior from Hatch to Market Weight, *Iowa State University Animal Industry Report* : AS 663, ASL R3168. Available at: [https://lib.dr.iastate.edu/ans\\_air/vol663/iss1/41](https://lib.dr.iastate.edu/ans_air/vol663/iss1/41)
14. B Evangelista, A Kastli; Z Kiefer; A Rangel, IJ Ehr\*, S, C Morris, **EA Bobeck**, AK Johnson, N Gabler, K Stalder, and B Kerr. (2017). The Effects of Dietary Omega 3 Fatty Acids on Commercial Broiler Lameness and Bone Integrity from Hatching to Market, *Iowa State University Animal Industry Report* : AS 663, ASL R3169. Available at: [https://lib.dr.iastate.edu/ans\\_air/vol663/iss1/42](https://lib.dr.iastate.edu/ans_air/vol663/iss1/42)

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### ASSISTANT PROFESSOR: OTHER EXTENSION EFFORTS [N=5]

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#### LECTURES [N=2]

1. **EA Bobeck** 2020. Iowa Poultry Fall Conference. Invited Lecture: Exploring nutritional and stress-based links to immunity in laying hens.
2. **EA Bobeck**. 2018. Opportunities for using nutrition to improve poultry production. Iowa Poultry Association Summer Lecture Series online lecture: <https://www.youtube.com/watch?v=bgAtGCEjo48>

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#### INTERVIEWS [N=3]

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1. Farmers Hen House- The Scramble Podcast. Interview with Brett Erickson. Fall 2020. Interview was on the topic of hen housing type and general questions about poultry. <https://soundcloud.com/user-298525310/the-scramble-featuring-dr-elizabeth-bobeck-of-iowa-state-university>
2. E McIntyre. Tractor Supply Co. Chicken Feed. Published online: Spring 2016 <https://www.tractorsupply.com/out-here-issues-2016-spring-chicken-feed>. Ms. McIntyre interviewed me about poultry nutrition and quoted me in this piece regarding nutrition for backyard poultry.
3. C Choi. 2018. Associated Press: Miami Herald. <https://www.apnews.com/fb3485dd37524ab7b806e17ebf70f160> <https://www.nwaonline.com/news/2018/dec/11/added-coloring-ways-consumer-food-deci/>. Ms. Choi interviewed me regarding the use of colors in hen diets to influence the yolk. I am directly quoted in her article.

### MEDIA RELATED TO RESEARCH (13)

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1. <https://www.wattagnet.com/articles/38819-researchers-use-laser-for-broiler-house-enrichment>
2. <https://www.feedstuffs.com/nutrition-health/laser-studied-broiler-house-enrichment>
3. <https://www.meatpoultry.com/articles/21939-lasers-used-in-broiler-house-enrichment-research>
4. <https://www.canadianpoultrymag.com/research/welfare/researchers-use-laser-to-stimulate-bird-activity-31128>
5. [https://www.uspoultry.org/mediacenter/pr\\_archive.cfm](https://www.uspoultry.org/mediacenter/pr_archive.cfm)
6. [Researchers Use Laser for Broiler House Enrichment \(9/24/2019\)](#)
7. <https://zootecnicainternational.com/featured/researchers-use-laser-broiler-house-enrichment/>
8. <https://www.uspoultry.org/communications/nv/current/12/>
9. <https://infoassetservice.atc.gr/OnlinePoultryJournal/Article.aspx?id=37574>
10. [http://www.chick-news.com/Share.aspx?Site\\_Copy\\_ID=227000](http://www.chick-news.com/Share.aspx?Site_Copy_ID=227000)
11. Land grant impact database: <http://www.landgrantimpacts.org/> Institution: Iowa Agriculture and Home Economics Experiment Station, Title: Iowa State researchers find lasers can be used to improve poultry health and productivity
12. <https://thepoultrysite.com/news/2019/11/researchers-use-laser-for-broiler-house-enrichment>
13. <https://www.youtube.com/watch?v=XLfrGADeoY0>

### ASSISTANT PROFESSOR: INVITED ORAL PRESENTATIONS [N=13]

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#### STATE INVITES [N=2]:

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1. Iowa Poultry Fall Conference. 2020. Invited Lecture: Exploring nutritional and stress-based links to immunity in laying hens.
2. Iowa Poultry Association online lecture series. June 2018. Opportunities for using nutrition to improve poultry production. 241 views as of 7/30/2020.

#### NATIONAL INVITES [N=7]:

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1. Validating Current Broiler Welfare Auditing Programs and Advancing Enrichment. Presented in Tech Talks at International Poultry Products Expo (IPPE), January 2020. Atlanta, GA.
2. Tunisia “train the trainers” USDA-sponsored training program. Broiler nutrition. July 2019. Ames, IA.
3. Annual Animal Science Association Meetings. Plenary speaker in the companion animal section. Seminar title: Functional Nutrition to Modulate the Immune System. July 2019. Austin, TX.



4. National Poultry Health Broiler and Turkey Health School. Seminar title: Avian Digestive System. May 2019. Ames, IA.
5. Roundtable for Sustainable Poultry & Eggs (US-RSPE) and the International Poultry Welfare Alliance First Annual Joint Meeting. Seminar title: Enrichments and Poultry Behavior: What have we learned? October 2019. Atlanta, GA.
6. Inaugural 4-minute abstract at Poultry Science Association Annual Meeting. Abstract selected and invited for this new program. Divergent cellular fuel preferences in primary immune cells isolated from commercial type laying hens and broilers. July 2018. San Antonio, TX.
7. Tunisia “train the trainers” USDA-sponsored training program. Broiler nutrition. July 2018. Ames, IA.

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INTERNATIONAL INVITES [N=4]:

1. 5-minute abstract sessions at 2019 Poultry Science Association Annual Meeting in Montreal, Canada. Abstract was selected out of all submissions. Broiler Enrichment: Welfare and Performance Benefits.
2. DDGS in poultry diets. South Korea. Broiler and Laying hen producers meetings (Seoul and Busan, South Korea). US Grains Council sponsorship. 2019.
3. AVEM (Avian Veterinary Conference; Mexico) Immune metabolism in poultry. March 2018.
4. DDGS in laying hen diets. Sonora Region (Mexico) Laying Hen Producers Organization. US Grains Council sponsorship. 2017.

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INVITED ORAL PRESENTATIONS PRIOR TO ISU [N=8]

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STATE INVITES [N=5]:

1. Oral antibodies for the treatment of hyperphosphatemia in chronic kidney disease. Departmental graduation exit seminar, UW-Madison, 2012.
2. Intestinal response to dietary phosphate restriction. Animal Science Nutrition Seminar, UW-Madison, 2011.
3. Intestinal phosphate uptake: regulation via novel antibody targets. Animal Science Nutrition Seminar, UW-Madison, 2011.
4. Biotransformation of aflatoxin B1: activation and detoxification. Animal Science Nutrition Seminar, UW-Madison, 2009.
5. Let them eat dirt: oral tolerance and the importance of early antigen exposure. Animal Science Nutrition Seminar, UW-Madison, 2008.

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NATIONAL INVITES [N=2]:

1. Pleiotropic effects of human NKT cells on hematopoiesis. Autumn Immunology Conference, Chicago, Illinois, 2014.
2. Oral Hen Egg Antibodies For The Control Of Hyperphosphatemia During Chronic Kidney Disease, Midwest Animal Science Annual Meeting, Des Moines, Iowa, 2013.

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INTERNATIONAL INVITES [N=1]:

1. Oral Presentation, abstract, and short paper: Thermoprotection of Bioactive Proteins Added to Animal Feed. Worlds Poultry Congress, Youth Program and Young Scientists Sessions, Australia, 2008.

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 ASSISTANT PROFESSOR: GRANTS AWARDED SINCE 2016: \$1,349,108
 

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RESEARCH TOTAL FUNDED BY YEAR: **2016**, \$17,750; **2017**: \$160,854; **2018**, \$72,325;  
**2019**: \$458,315; **2020**: \$139,972; **2021**: \$499,892

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TEACHING SUPPORT GRANTS [N=1] **2018**: \$5,242

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 ASSISTANT PROFESSOR: AWARDS AND HONORS [N=1]
 

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- 2016 Poultry Science Young Scholar Award, World's Poultry Science Meeting, Beijing, China. The World's Poultry Science Congress is held every 4 years, with average attendance >4,000 depending on travel location. The World's Poultry Science Association has 8,000 international members and this award is given to 20 participants under the age of 35.

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 AWARDS AND HONORS PRIOR TO ISU [N=12]
 

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- Selected out of 30+ applicants for one of two positions on competitive UW-Madison School of Medicine 2015 NIH T32 Hematology Training Grant
  - Post-doctoral Fellowship in Basic Hematological Research
- Wisconsin Stem Cell Symposium, top 10 poster out of 30+ entries, 2014
- Midwest Animal Science Association Young Scholar Award, 2013
- Wisconsin Alumni Research Foundation Ambassador, 2010-2012
- Wisconsin Entrepreneurial Bootcamp (WEB), 2011
- Nutritional Science Spring Graduate Poster Competition. 2011. 2<sup>nd</sup> place in poster competition
  - **Bobek E.A.** and M.E. Cook. Phosphate-dependent physiological changes during short-term dietary phosphorus deficiency with or without a dietary phosphorus binder. *FASEB J* April 6, 2010 24:917.22.
- Nutritional Science Spring Graduate Poster Competition. 2010. 1<sup>st</sup> place in poster competition
  - **Bobek E.A.** and M.E. Cook. Dietary sevelamer hydrochloride prevents dietary 1-alpha hydroxycholecalciferol (1 alpha-OH D<sub>3</sub>)-induced increases in plasma phosphorus. *FASEB J* April 22, 2009 23:909.6.
- World's Poultry Congress Youth Program, United States Delegate, 2008
- World's Poultry Congress, US Young Scientist Delegate, 2008
- Hydrophobic Protein Matrices for Stabilizing Heat-Labile Proteins. Poster selected for presentation and public viewing at Posters in the Rotunda, Wisconsin Capitol Building. One of 12 posters selected out of 200+.
  - **Bobek E.A.**, D.L. Trott, and M.E. Cook. 2006. Heat stability of *gallus domesticus* Immunoglobulin Y (IgY) (New Data).
- Hilldale Undergraduate Research Award. 2006-2007. This award is the highest research honor for undergraduates on UW-Madison campus

- Wisconsin Journal of Science (WISCI), 2005-2007. Undergraduate Peer-Reviewed Research Journal. Business Manager and Peer-Reviewer

## ASSISTANT PROFESSOR: TEACHING RESPONSIBILITIES [N=4 MAIN OR CO-INSTRUCTOR; N=3 GUEST LECTURER]

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### SUMMARY

Since joining the faculty in January 2016, my contributions to the Animal Science teaching program have positively impacted undergraduate and graduate students at ISU, but also a broader undergraduate base in the Midwestern region. I teach AnS 318 (Poultry Nutrition; 3cr; 13-22 students) at Midwest Poultry Consortium's Center of Excellence (COE), a regional, specialized undergraduate educational program, in May/June, and AnS 223 (Poultry Science; 3cr; 26-29 students) every fall. I have become responsible for a third of AnS 518 Digestive Physiology and Metabolism of Non Ruminants (odd years, I teach nutritional immunology; 10-15 students; 3cr; two 2h lectures/week) as of 2019. The nutrition faculty rotate responsibility for AnS 603 (1cr; fall; 15-25 graduate student seminar).

I additionally guest lecture for:

- VDPAM 408 (one 1-hour lecture; Avian Diseases; topic: nutritional diseases; 2cr; 25 veterinary students) in the spring of even years
- AnS 190 both spring and fall (Animal Handling; topic: poultry industry and handling; 1cr; approx. 30 students, one 2-hour lecture and lab/semester)
- AnS 320 (Feeds and Feeding; 3cr; topic: 2 50-minute lectures on poultry nutrition; approx. 100-120 students) both spring and fall semesters.

### INSTRUCTOR OR CO-INSTRUCTOR [N=4]

**AnS 223.** Poultry Science. Sole instructor. Taught fall, 3cr. Introduction to modern production trends with a focus on broiler, layer, and turkey industries. Topics covered include breeds, handling, management, physiology, nutrition, genetics, health & disease, and products. Weekly labs meet off campus

**AnS 373D.** Poultry Nutrition. Course coordinator and instructor. Taught at Midwest Poultry Consortium Center of Excellence (COE) previously in Madison, WI (listed as AnS 314), now held at ISU. Summer course, 3cr. Conceptual understanding of nutrient requirements for optimal growth and production of commercial poultry species. The use of computer programming for feed formulation is emphasized.

Info on Midwest poultry consortium: <http://www.mwpoultry.org/>

Center of Excellence scholarship program: <http://www.mwpoultry.org/COEhome.html>.

Info on Center of Excellence class syllabi: <http://www.mwpoultry.org/COEcourses.html>

**AnS 518.** Graduate nutrition and metabolism of monogastrics. 3cr, Spring of odd years. Co-Instructor (1/3) with Nick Gabler (2/3). Digestion and metabolism of nutrients. Nutritional requirements and current research and feeding programs for poultry and swine.

**AnS 603.** Graduate Nutrition Seminar. 1cr, Fall semester. Animal Science nutrition faculty rotate as co-instructors. Discussion of current literature; preparation, and submission of abstracts.

### GUEST LECTURER [N=3]

**AnS 190.** Livestock handling, safety, and welfare. Fall and Spring semesters, 1cr. 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 related to livestock handling and movement. I guest lecture for the poultry section both semesters.

**AnS 320.** Animal Feeds and Feeding. Fall and Spring semesters, 4cr. Composition, physical properties, and storage and processing of feedstuffs. Nutrient requirements of and diet formulation, and preparation systems for food and companion animal species at varying stages of age, activity or production. Manual and computer methodologies for diet formulation. I guest lecture for 2 lectures/semester based on poultry nutrition and diet formulation each Spring and Fall semester.

**VDPAM 408.** Poultry Diseases. Spring semester even years, 2cr. Bacterial, viral, parasitic, and nutritional diseases of domestic poultry and gamebirds; biosecurity, immunization, and management procedures to prevent poultry diseases. This course includes wet labs.

### ASSISTANT PROFESSOR: TEACHING RESPONSIBILITIES SUMMARY TABLE\*

Semester & Year	Course #	Course Title	Enrollment	% of course, for which responsible
Fall 2020	AnS 223	Poultry Science	28	100%
Summer 2020	AnS 373D	Poultry Nutrition	13	65%
Fall 2019	AnS223	Poultry Science	28	100%
Summer 2019	AnS 314	Poultry Nutrition	13	65%
Spring 2019	AnS 518	Monogastric Nutrition and Digestive Physiology	12	33%
Fall 2018	AnS 223	Poultry Science	29	100%
Summer 2018	AnS 314	Poultry Nutrition	22	65%
Spring 2018	AnS 603	Graduate Nutrition Seminar	20	50%
Fall 2017	AnS 223	Poultry Science	26	100%
Summer 2017	AnS 314	Poultry Nutrition	22	65%
Fall 2016	AnS 223	Poultry Science	28	100%
Spring 2016	AnS 223	Poultry Science	26	100%

\*Guest lecture responsibilities are not summarized here

### ASSISTANT PROFESSOR: GRADUATE STUDENT MENTORING

#### MAJOR PROFESSOR [N=4]

<i>Major Professor: Program of Study Committee</i>				
Student	Major Professor	Major	Degree	Expected Completion

Kayla Elmore	E. Bobeck	AND	M.S.	2022
Meaghan Meyer	E. Bobeck	ANS	Ph.D.	2023
Krysten Fries-Craft	E. Bobeck	ANS	Ph.D.	2023
Meaghan Meyer	E. Bobeck	ANS	M.S.	Completed August 2019
Krysten Fries-Craft	E. Bobeck	ANS	M.S.	Completed August 2019
Isa Ehr	E. Bobeck	ANS	M.S.	Completed August 2017
POSC COMMITTEE MEMBER [N=4]				
<i>Currently Serving as Program of Study Committee Member</i>				
Moriah Bilenky	A Nair	HORT	Ph.D.	May 2021
Graham Redweik	M Mellata	BACT	Ph.D.	May 2021
Jessica Johnson	N Gabler	ANS	MS	May 2023

## GRADUATE STUDENT PRODUCTIVITY [N=3]

Graduate Student	Abstracts	Animal Industry Reports	Refereed Publications	Manuscripts in preparation
Meaghan Meyer (MS)	14	4	4	1
Krysten Fries-Craft (MS)	8	4	3	2
Isa Ehr (MS)*	1	1	1	3

\*Dr. Bobeck became Isa Ehr's Major Professor in March of 2017 when his previous PI changed institutions during Isa's graduate career and requested to be removed as Major Professor. Therefore, Dr. Bobeck is co-author on fewer publications than is typical of a MS student under her direction for their entire graduate career.

## GRADUATE STUDENT AWARDS AND RECOGNITION [N=13]

Graduate Student Awards and Recognition	
Student	Award
Meaghan Meyer	<ol style="list-style-type: none"> <li>2020. Iowa Poultry Association Scholarship, in Honor of Tom J. Zanios</li> <li>2020. Charles H. and Inez M. Callahan Memorial Graduate Award</li> <li>2019. Iowa Poultry Association Scholarship for excellence in academic performance and interest in the poultry industry in honor of Tom J. Zanios</li> <li>2019. F. Wendell Miller Fellowship</li> <li>2018. Department of Animal Science: Charles H. and Inez M. Callahan Memorial Graduate Award (\$2,000)</li> <li>2018. College of Agriculture and Life Sciences: Graduate and Professional Student Senate (GPSS) Professional Advancement Grant (PAG) travel grant to attend the American Society of Animal Science-Midwest chapter's annual meeting in Omaha, NE (\$200).</li> </ol>
Krysten Fries-Craft	<ol style="list-style-type: none"> <li>2020. William Riley Gillette Graduate Scholarship in Animal Science, Iowa State University. In recognition of academic performance in the Department of Animal Science</li> <li>2020. World's Poultry Science Association, World's Poultry Congress Youth Program. Awarded to 44 applicants from 27 countries</li> <li>2019. Poultry Science Association, Student Research Certificate of Excellence. Presented in recognition of students who have presented high-</li> </ol>

	<p>quality research papers at the 2019 annual meeting in Montreal, Quebec, Canada</p> <p>4. 2019. Gamma Sigma Delta Agriculture Honors Society. Minimum GPA of 3.50</p> <p>5. 2018. Iowa Poultry Association: Scholarship for excellence in academic performance and interest in the poultry industry, in Honor of Tom J. Zanius (\$1,500)</p> <p>6. 2018. Poultry Science Association Travel Award: National Graduate Student Competition to attend yearly international research conference (\$1,000).</p> <p>7. 2018. College of Agriculture and Life Sciences: Graduate and Professional Student Senate (GPSS) Professional Advancement Grant (PAG) travel grant to attend the American Society of Animal Science-Midwest chapter's annual meeting in Omaha, NE (\$200).</p>
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## ASSISTANT PROFESSOR: UNDERGRADUATE STUDENT TRAINING AND MENTORED PROJECTS

### BROILER ENVIRONMENTAL ENRICHMENT PROJECT [N=12]

The following table describes opportunities where undergraduates were able to work with us on research projects, were trained in the following briefly described procedures and husbandry practices, and were mentored on two levels: by myself, and a MS or PhD graduate student in my lab. These outcomes were novel behavior or welfare measurements adapted from pig audit guidelines for broilers, in collaboration with Dr. Anna Johnson.

Undergraduate Student Name	Semester	Student Research Training and Additional Outcomes
Kayla Elmore	Spring 2020	Senior Honors capstone project/Mc Nair Scholar: determining what percent of a broiler pen interacted with a laser enrichment device, and how that affected movement in the remainder of the birds in the pen. 490H: 3 credit hours independent study, abstract, and poster (online)
Emily Kurtz	Summer 2019	Laser following: what percent of birds followed the laser enrichment device when it was activated, and duration of following behavior.
Marydith Barkley	Spring 2019	Latency to Feed: Measuring (seconds) how long after enrichment period it takes a bird to go to feeder using recorded video 490H: 3cr honors independent study, poster, and abstract
Maddison Wiersema	Spring 2018	Human-Approach Paradigm & Walking Distance: Measure the likelihood for a broiler to approach a human entering a pen, and measure how far a bird walks (cm) during novel enrichment periods using recorded video. 490H: 3cr honors independent study
Courtney Jaeger	Spring 2018	Home Pen Behavior: Using recorded video, categorize what birds are doing in a 4-minute video clip over a production period (resting, eating, interacting with peer in pen, etc). 490H: 3cr honors independent study
Kathryn Kuhl	Spring 2018	Walking Distance: Measure how far a bird walks (cm) during novel enrichment periods using recorded video. 490H: 3cr honors independent study



Julianna Jespersen	Spring 2018	Walking Lameness: Determine ability of broiler bird to walk and level of lameness over a production period (6wk). 1 Science with Practice Project and 1 Abstract as first author.
Julianna Jespersen	Spring 2018	Diet mixing and weighing birds: Understanding and identifying ingredients that are formulated into starter, grower, and finisher experimental poultry diets. Using weighing and measuring precision to produce each diet to specifications formulated by Dr. Bobeck. Weighing birds on weekly intervals; understanding of broiler behavior, normal growth and ambulation patterns, and growth rates.
Stephanie Nielson	Spring 2018	Diet mixing & weighing birds: Understanding and identifying ingredients that are formulated into starter, grower, and finisher experimental poultry diets. Using weighing and measuring precision to produce each diet to specifications formulated by Dr. Bobeck. Weighing birds on weekly intervals; understanding of broiler behavior, normal growth and ambulation patterns, and growth rates.
Maddison Wiersema	Spring 2018	Weighing birds on weekly intervals; understanding of broiler behavior, normal growth and ambulation patterns, and growth rates.
Caitlyn Spencer	Summer 2018	Home Pen Behavior & Walking Distance: Using recorded video, categorize what birds are doing in a 4-minute video clip over a production period (resting, eating, interacting with peer in pen, etc); Measure how far a bird walks (cm) during novel enrichment periods using recorded video.
Maddison Wiersema	Fall 2018	Walking Distance: Measure how far a bird walks (cm) during novel enrichment periods using recorded video.
Breanna Bagby	Fall 2018	Home Pen Behavior: Using recorded video, categorize what birds are doing in a 4-minute video clip over a production period (resting, eating, interacting with peer in pen, etc.). Independent study 490 (3 cr)

#### NUTRITION, IMMUNOLOGY, MOLECULAR BIOLOGY [N=13]

The following table describes opportunities where undergraduates were able to work with us on research projects, were trained in the following briefly described procedures and husbandry practices, and were mentored on two levels: by myself, and a MS or PhD graduate student in my lab.

Student Name	Semester	Lab Techniques and Additional Outcomes
Caitlyn Spencer	Fall 2019	Villus height and crypt depth changes at baseline and during a coccidiosis challenge in broilers exposed to an algae feed ingredient. Science With Practice Project, 1 abstract as first author
Tyler Lowe	Fall 2019-present	Isolating PBMCs, isolating splenocytes, freezing, thawing, and counting cells, homogenizing samples, reagent prep, general lab procedures, general poultry work and husbandry, feed mixing
Tanner Volkmann	Fall 2019-present	Isolating PBMCs, isolating splenocytes, freezing, thawing, and counting cells, homogenizing samples, reagent prep, general lab procedures, general poultry work and husbandry, feed mixing
Emily Kurtz	Summer and Fall 2019	Isolating PBMCs, isolating splenocytes, freezing, thawing, and counting cells, homogenizing samples, reagent prep, general lab procedures, general poultry work and husbandry, feed mixing



Sally Howard	Summer and Fall 2019	Isolating PBMCs, isolating splenocytes, freezing, thawing, and counting cells, homogenizing samples, reagent prep, general lab procedures, general poultry work and husbandry, feed mixing
Katelyn Bailey	Fall 2018-present	Isolating PBMCs, isolating splenocytes, freezing, thawing, and counting cells, homogenizing samples, reagent prep, general lab procedures, general poultry work and husbandry, feed mixing
Caitlyn Spencer	Summer 2018-present	Isolating PBMCs, isolating splenocytes, freezing, thawing, and counting cells, homogenizing samples, reagent prep, general lab procedures
William Mengler	Spring 2018	Isolating splenocytes, homogenizing tissue samples, freezing and counting cells, serum collection, reagent prep, general lab procedures
Sarah Bennett	Fall 2017-Spring 2018	Isolating splenocytes, isolating PBMCs, homogenizing tissue samples, freezing and counting cells, serum collection
Stephanie Nielsen	Fall 2017-Spring 2018	Preparation and freeze-drying of egg yolks, mixing poultry feed
Maddi Wiersema	Fall 2017-present	Preparing feed samples for analysis (grinding and drying).
Cece Gregg	Fall 2017-Fall 2018	ELISAs, thawing and counting cells, PEG extraction of egg yolk antibody, sterile solution preparation, autoclaving, general hourly duties. 1 Science with Practice Project, 1 abstract as first author.
Juli Jespersen	Spring 2016-Spring 2018	Isolating PBMCs, Soxtec Hexane Fat Extractor (Crude Fat determination protocol), DNA extraction, using the freeze dryer, general lab duties. 4 Abstracts, 1 as first author.

#### DEVELOPMENT OF EDUCATIONAL GRAPHIC MATERIAL [N=1]

The following table describes opportunities where I worked with an undergraduate student to develop novel infographics and graphic materials for my AnS 223 Poultry Science course.

Student Name	Semester	Techniques Learned and Additional Outcomes
Savannah Kittel	Fall 2018	Development of graphics for use in teaching anatomy, physiology, interactive graphics (blanks/filled in), infographics for common misconceptions in poultry industry, understanding gaps where undergraduates need additional supporting material to learn about poultry and poultry industry. Independent study 490 1credit

#### ASSISTANT PROFESSOR: STUDENT RECRUITMENT FOR MIDWEST POULTRY CONSORTIUM CENTER OF EXCELLENCE

##### BACKGROUND

One platform where I can positively influence further participation in poultry education and industry is the Midwest Center of Excellence scholarship program. The Midwest Poultry Consortium Center of Excellence was created over 20 years ago as a summer program for universities in the Midwest that had students interested in poultry, but without a poultry-specific program of their own at their University. To this end, students from 14 Midwestern Universities travel to UW-Madison each summer for 6 weeks of courses (three

3-credit courses in a row, each 2 weeks in length) with content experts, followed by a 6-week internship in the poultry industry. The full program is 2 summers long (year 1 and year 2) and credits transfer back to the student's home institution. Students are selected from sponsoring institutions based on academic performance and interest in a poultry-related career. Industry funds scholarships for the majority of students (tuition and housing), and partial scholarships are also awarded where the student is responsible for tuition. I am responsible for teaching and coordinating the Poultry Nutrition course and as of 2020, I am the Site Coordinator as the program has moved to ISU. Dr. Carl Parsons also teaches in the course and I coordinate guest experts. <https://www.cals.iastate.edu/news/releases/iowa-state-university-hosts-online-poultry-internship-program-midwest-poultry>.

All courses are held 8am-5pm with a break for lunch, and typically there are 2-3 50-minute lectures presented in the morning, with 1-2 50-minute lectures in the afternoon, and a 2-3-hour lab portion on a daily basis. I raise awareness for the program by hosting Chelsea Russel, who is a coordinator for MPC, in my AnS 223 course each fall. The table below positively reflects my efforts of student recruitment and participation of ISU in the program. In 2017-2019, ISU was among the top 3 out of 14 schools in terms of highest applicant rate as well as final selected participants.

TABLE: IOWA STATE UNIVERSITY'S SUCCESS IN COE REPRESENTATION

Year	Poultry Nutrition Professor	# full scholarship	FL	IA	# IA Applied	IL	IN	KS	MI	MN	MO	NE	ND	OH	SD	UWM	UW RF	VS**	Total
2020	Dr. Bobeck	29	3	5	10	2	4	1	5	2	1	1	1	2	1	0	2	0	29
2019	Dr. Bobeck	24	2	6	9	1	6	1	4	2	2	1	2	4	3	1	1	1	37
2018	Dr. Bobeck	25	0	7	16	2	2	1	3	1	1	0	4	5	4	1	1	0	35
2017	Dr. Bobeck	30	2	3	6	1	3	2	4	2	2	1	2	6	2	3	1	0	36
2016	Dr. Bobeck*	27	1	2	9	2	3	1	3	3	1	1	1	3	1	2	1	2	29
2015	none	27	0	3	6	1	4	2	4	2	0	1	1	4	1	1	1	5	32
2014	none	28	0	5	-	1	5	2	4	4	0	0	1	1	0	2	1	7	35
2013	Dr. Persia	29	0	4	-	1	6	2	4	3	0	1	1	0	0	2	3	5	34
2012	Dr. Persia	26	0	3	-	1	7	0	5	1	1	0	0	0	2	2	5	1	27

\*Dr. Bobeck joined faculty after students already selected

\*\*VS= visiting scholar

## GRANTS AND FELLOWSHIPS PRIOR TO ISU

- Selected out of 30+ applicants for one of two positions on competitive UW-Madison School of Medicine, 2015-2016 NIH T32 Hematology Training Grant, Post-doctoral fellowship in Basic Hematological Research
- Co-author on National Institutes of Health R21 Awarded April 2015: "Understanding the impact of human iNKT on hematopoiesis"
- Bohstedt-Kiwanis Travel Grant, 2012 Annual Poultry Science Meeting, Athens, GA
- Madison Initiative for Undergraduates: 2010 Co-author of Teaching Assistant Grant
- CALS Departmental Poultry Scholarship 2008, 2009, 2010, 2011, 2012
- Mary Heisdorf scholarship; College of Agriculture and Life Sciences Departmental Poultry Scholarship, 2008, 2009, 2010, 2011, 2012
- Cliff Carpenter Essay Competition Travel Grant, 2008 World's Poultry Congress, Brisbane, Australia

- World's Poultry Congress Young Scientist Grant, 2008, Brisbane, Australia
- Hilldale Undergraduate/Faculty Research Fellowship, 2006-2007
- CALS Senior Honor Thesis Research Fellowship, 2006-2007

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#### ASSISTANT PROFESSOR: PROFESSIONAL SERVICE

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- External Ph.D. thesis reviewer: 2019- Matthew Hilliar, University of New England, Armidale New South Wales, Australia
- Metabolism and Nutrition Program Committee, Poultry Science Association 2018-2019
- Gamma Delta Sigma: ISU Chapter President 2019-2020
- Gamma Delta Sigma: ISU Chapter Vice President 2018-2019
- Metabolism and Nutrition Abstract Review chair; Poultry Science Association 2017-present
- Metabolism and Nutrition Abstract Review; Poultry Science Association 2016-present
- Animal Science Departmental Curriculum committee member, 2017-present
- Animal Science Chuckwagon Breakfast committee member, 2017-present
- Animal Science Department Seminar committee member, 2016-present

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#### PROFESSIONAL DEVELOPMENT PRIOR TO ISU

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- Iowa State University Center for Excellence in Teaching and Learning: Fall 2012 Teaching Philosophy Course
- Wisconsin Entrepreneurial Bootcamp (WEB). Co-taught by John Morgridge, former CEO of Cisco Systems, and Steve Burrill of Burrill and Co., 2010
- Start-up Business Plan Development Course, 2008
- American Association of Immunologists Advanced Course in Immunology, Minneapolis, MN, 2008

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#### ASSISTANT PROFESSOR: SERVICE TO THE COLLEGE OF AGRICULTURE AND LIFE SCIENCE AND THE DEPARTMENT OF ANIMAL SCIENCE (N=11)

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##### ASSISTANT PROFESSOR: CURRENT STANDING AND AD HOC COMMITTEE MEMBERSHIP (N=7)

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1. ***Ad hoc Committee to build new Iowa State University Turkey Facilities:*** Participate in building design; provide user input for layout, functionality, and needs for live bird (nutrition/physiology/brooding room/scientific space use). (2019-present)
2. ***Standing Curriculum Committee member:*** responsible to attend twice monthly meetings. Currently aiding in efforts to collect information to complete departmental curriculum review, which involves going through each level of classes the department offers (400,300,200,100-level) and understanding outcomes, aligning with department mission. Other tasks include review of the Animal Science undergraduate and graduate catalog for revisions, required courses, etc. (2016-present)
3. ***Standing Chuckwagon breakfast Committee:*** Participate in twice-yearly homecoming breakfast and graduation lunch in support of alumni and graduating Animal Science students. Efforts include 4

hours of setup and takedown per event, and 3-4 hours of time spent participating in the event (cooking/restocking food/ interacting with guests) at Hanson Center. (2017-present)

4. ***Standing Seminar Committee:*** Brainstorm, contact, and organize guest speakers for Spring Animal Science seminar series (1x/weekly). Meet with speakers, introduce, and host on as-needed basis. (2017-present)
5. ***Standing Poultry Section Award Committee:*** Each year the Poultry Faculty at Iowa State University meets to nominate faculty and industry members for yearly awards presented at the Poultry Science Association. We do this as a service to our departmental and local poultry industry members. Since 2016, I have been responsible for at least 2 nomination packages/year, which involve writing and soliciting letters of support, developing a nomination package based on nominee input, and submission to Poultry Science Association.
6. ***Standing Academic Quadrathlon (AQ):*** AQ is an undergraduate-level competition where students take an exam on a species-basis, and the winning team of 4 goes to a national competition. Our department holds a preliminary competition each winter to decide which team to send in spring of each year to the national competition. Team competitions have ranged from 2-10+ teams. I am responsible for the Poultry Station, which involves a written test regarding poultry husbandry, nutrition, housing, genetics, and general management. (2016-present).
7. ***Standing Advisor/Campus contact for Center of Excellence (COE) Poultry Consortium:*** Since 2016, I am the on-campus contact for Midwest COE, in addition to serving on the selection committee and teaching AnS 314. In 2020, I additionally became the on-site coordinator for the first year of courses moving to Iowa State University.

ASSISTANT PROFESSOR: PAST COMMITTEE AND AD HOC COMMITTEE  
MEMBERSHIP (N=4)

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1. ***Ad hoc Committee to build new Iowa State University Poultry Facilities:*** Participate in building design; provide user input for layout, functionality, and needs for live bird (nutrition/physiology/brooding room/teaching space/scientific space use). (2016-2020)
2. ***Ad hoc New incoming ISU faculty panel:*** Participated in panel for new incoming ISU faculty members: how to be successful in first year (Fall 2016 and 2017). One of 4 panel members: Answered questions for incoming faculty, suggestions on how to navigate the first year, etc.
3. ***Ad hoc Lab manager selection for monogastric nutrition lab (2018):*** Candidate review of 17 applications to narrow down to 3 for in-person interviews. Participated in in-person interviews, asked relevant questions, as well as final candidate selection and hiring (Sandamali Dassanayanke, June 2018).
4. ***Ad hoc ISU Veterinary Medicine Poultry Veterinarian Search Committee:*** Develop criteria for the position (extension/research/teaching component), publicize job opening with potential candidates, review applications, and attend selection meetings. Attend interview of 3 finalists and select final candidate (Mohammed El-Gazzar). Summer-Fall 2017.

ASSISTANT PROFESSOR: SERVICE TO PROFESSIONAL ASSOCIATIONS

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1. As a service to my profession and colleagues, below is a list of journals I have been a peer-reviewer for since 2016, with the number of manuscripts/year listed in parenthesis. I also review grants for the Iowa Egg Industry Center (1/year since 2016).

Journal of Poultry Science (5/year) <a href="https://academic.oup.com/ps">https://academic.oup.com/ps</a>	European Journal of Lipid Science and Technology (1/year) <a href="https://onlinelibrary.wiley.com/journal/14389312">https://onlinelibrary.wiley.com/journal/14389312</a>
Journal of Applied Poultry Science (3/year) <a href="https://academic.oup.com/japr">https://academic.oup.com/japr</a>	Plos One (2/year) <a href="https://journals.plos.org/plosone/">https://journals.plos.org/plosone/</a>
Journal of Animal Science (2/year) <a href="https://academic.oup.com/jas">https://academic.oup.com/jas</a>	Journal of Immunobiology (2/year) <a href="https://www.omicsonline.org/immunobiology.php">https://www.omicsonline.org/immunobiology.php</a>
Journal of Animal Science and Biotechnology (5/year) <a href="https://jasbsci.biomedcentral.com/">https://jasbsci.biomedcentral.com/</a>	Virology (1/year) <a href="https://www.journals.elsevier.com/virology">https://www.journals.elsevier.com/virology</a>
Scientific Reports (Nature subsidiary) (2/year) <a href="https://www.nature.com/srep/">https://www.nature.com/srep/</a>	Animals (1/year) <a href="https://www.mdpi.com/journal/animals">https://www.mdpi.com/journal/animals</a>
Fermentation (1/year) <a href="https://www.mdpi.com/journal/fermentation">https://www.mdpi.com/journal/fermentation</a>	Nutrients (1/year) <a href="https://www.mdpi.com/journal/nutrients">https://www.mdpi.com/journal/nutrients</a>

2. Ex-officio member of the Iowa Turkey Federation, 2016-present. My role is to attend quarterly meetings, provide updates to stakeholders on research we are doing on campus, and volunteer at events related to the Iowa Turkey Federation (e.g. Iowa State Fair) to bring awareness to the turkey industry.
3. Poultry Science Association Annual Meeting: Abstract review (Peer-review of 25 abstracts/ year ; 2016-present). In 2018, I was asked to be the chair for review of abstracts submitted to the Metabolism and Nutrition section, which is the largest section for poultry science abstract submission (290 out of 685 total abstracts submitted in 2018). It was my job to ensure abstracts were submitted to the correct section, ensure students were assigned correctly to competitions, assign sections and reviewers, review abstracts, organize sessions, find session chairs, and check in during sessions to ensure sessions were on time.