

MaryGrace Erickson, Ph.D.

Postdoctoral Research Associate

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Education and Certifications

Ph.D. <i>Dairy Science</i> , University of Wisconsin	Aug. 2023
M.S. <i>Animal Sciences</i> , Purdue University	Aug. 2019
P.A.S. <i>Dairy Science</i> , American Registry of Professional Animal Scientists	Jun. 2017
B.S. <i>Animal Sciences</i> , Purdue University	May 2017

Research Positions

Postdoctoral Associate Bioproducts & Biosystems Engineering University of Minnesota St. Paul, MN <i>Advised by:</i> E.L. Cortus	Aug. 2023-Present
Graduate Research Assistant Animal & Dairy Sciences University of Wisconsin Madison, WI <i>Advised by:</i> M.A. Wattiaux (chair), M.J. Culbertson, L.L. Hernandez, H. Khatib, & G.I. Zanton	Aug. 2019 - Aug. 2023
Graduate Research Assistant Animal Science Purdue University West Lafayette, IN <i>Advised by:</i> E.L. Karcher (chair), M.A. Erasmus, & N.A. Knobloch	Aug. 2017 - Aug. 2019
Dairy Research Intern Cargill Animal Nutrition Brookville, OH <i>Advised by:</i> J. Quigley, J. Aldrich, J. Kohler, & L. Deikun	May-Aug. 2017
Dairy Nutrition Research Assistant Purdue University West Lafayette, IN <i>Advised by:</i> S.S. Donkin	2016-2017
Research Intern USDA/ARS Livestock Behavior Research Unit West Lafayette, IN	May-Aug. 2014
Dairy Nutrition Research Assistant Purdue University West Lafayette, IN <i>Advised by:</i> T.D. Nennich	2012-2014

Publications

20 peer-reviewed publications including 14 as first-author; plus 6 submitted articles in review

JOURNAL ARTICLES

- [20] D.M. Pizarro, **Erickson, M.G.**, Gomez, C.A., Picasso, V.D., Lucantoni, D., Mottet, A., & M.A. Wattiaux (2024). Agroecological performance of smallholder dairy cattle systems in the Peruvian Amazon. *Agricultural Systems*, 223, 104199. <https://doi.org/10.1016/j.agry.2024.104199>
- [19] Reed, K.F., **Erickson, M.G.**, Barros, T., Danes, M.A.D., Powell, J.M., Zanton, G.I. & M.A. Wattiaux (2024). Non-linear models of ¹⁵N partitioning kinetics in late lactation dairy cows from individually-labeled feed ingredients. *Journal of Dairy Science*, 107(11), 9176–9196. <https://doi.org/10.3168/jds.2023-24239>
- [18] **Erickson, M.G.**, Barros, T., Aguerre, M.A., Olmos Colmenero, J.J., Bertics, S.J., & M.A. Wattiaux (2024). Reducing dietary crude protein: Effects on digestibility, nitrogen balance, and blood metabolites in late-lactation Holstein cows. *Journal of Dairy Science*. 107(7):4394-4408. <https://doi.org/10.3168/jds.2023-24079>
- [17] **Erickson, M.G.**, Reinhardt, L.A., Svaren, L., Sullivan, M.L., Zanton, G.I., & M.A. Wattiaux (2024). Crude protein oscillation in diets adequate and deficient in metabolizable protein: effects on nutrient digestibility, nitrogen balance, plasma amino acids, and greenhouse gas emissions. *Journal of Dairy Science*. 107(6):3558–3572. <https://doi.org/10.3168/jds.2023-24150>
- [16] De los Santos, J.A., **Erickson, M.G.**, Wattiaux, M.A., & J.J. Parrish. (2023). Retrospective ratings of learning across pre-pandemic, emergency-remote, and post-pandemic instruction in an introductory biology laboratory. *North American College Teachers of Agriculture Journal*. 67(1):323-329. <https://doi.org/10.56103/nactaj.v67i1.123>
- [15] **Erickson, M.G.**, Zanton, G.I., & M.A. Wattiaux (2023). Dynamic lactation responses to dietary crude protein oscillation in diets adequate and deficient in metabolizable protein in Holstein cows. *Journal of Dairy Science*. 106(12):8774-8786. <https://doi.org/10.3168/jds.2023-23603>
- [14] **Erickson, M.G.** & M.A. Wattiaux (2022). Case study: introductory student onboarding with place-based, blended learning. *North American College Teachers of Agriculture Journal*. 66(1), 123-132. <https://doi.org/10.56103/nactaj.v66i1.48>
- [13] Simmermeyer, E., **Erickson, M.G.**, Walsh, S., & E.L. Karcher (2022). Associating synchronous and asynchronous remote teaching formats with situational interest and motivation. *North American College Teachers of Agriculture Journal*. 66, 57-64. <https://doi.org/10.56103/nactaj.v66i1.29>
- [12] **Erickson, M.G.** & M.A. Wattiaux. (2021). Practices and perceptions at the COVID-19 transition in animal sciences courses. *Natural Sciences Education* 2021;1-18. <https://doi.org/10.1002/nse2.20039>

Featured
Publications

- [11] **Erickson, M.G.**, Wattiaux, M. A., Marks, D., & Karcher, E. L. (2021). Brief, written reflections improve interest of introductory animal science undergraduates. *CBE—Life Sciences Education*, 20(2), ar28. <https://doi.org/10.1187/cbe.20-08-0164>
- [10] **Erickson, M.G.**, Wattiaux, M.A., & Karcher, E.L. (2020). Longitudinal measurement invariance and stability of individual interest across a 16-week introductory animal sciences course. *Natural Sciences Education*, 49(1), e20031. <https://doi.org/10.1002/nse2.20031>
- [09] **Erickson, M.G.**, Ranathunga, S.D., & Wattiaux, M.A. (2020). Animal sciences undergraduate education since the ASAS centennial: a national survey and scoping review. *Translational animal science*, 4(4), txaa202. <https://doi.org/10.1093/tas/txaa202>
- [08] **Erickson, M.G.**, Guberman, D., Karcher, E.L. (2020) Undergraduates' experiences of transculturation toward engaged pedagogy through a partnership program in animal sciences. *North American College Teachers of Agriculture Journal*. 64:214-223. <https://www.jstor.org/stable/27157796>
- [07] **Erickson, M.G.**, Grant, J.L., Karcher, E.L. (2020). Structured support advances Extension educator intercultural development during a short-term study-abroad experience. *Journal of Extension*. 58(4), 12. <https://tigerprints.clemson.edu/joe/vol58/iss4/12>
- [06] **Erickson, M.G.**, Marks, D., & Karcher, E. (2020). Characterizing student engagement with hands-on, problem-based, and lecture activities in an introductory college course. *Teaching & Learning Inquiry*, 8(1), 138–153. <https://doi.org/10.20343/teachlearninqu.8.1.10>
- [05] Malacco, V.M., **Erickson, M.G.**, Cardoso, F.F., Biese, B.P., Laguna, J.G., Donkin, S.S. (2020) Short communication: Effect of glucose infusion dose and stage of lactation on glucose tolerance test kinetics in lactating dairy cows. *Journal of Dairy Science*, 103(8), 7437-7554. <https://doi.org/10.3168/jds.2019-17139>
- [04] **Erickson, M.G.**, Knobloch, N.A., Karcher, D.M., Erasmus, M., Karcher, E.L. (2020). High School Student and Teacher Perceptions of an Online Learning Experience Integrating STEM and Poultry Science. *Journal of Agricultural Education*, 61(2), 20-40. <https://doi.org/10.5032/jae.2020.02020>
- [03] **Erickson, M.G.**, Knobloch, N.A., Karcher, D.M., Erasmus, M., & Karcher, E.L. (2019). Poultry in the classroom: effectiveness of an online education program designed to increase high school students' interest in poultry science. *Poultry Science*, 98(12), 6593-6601. <https://doi.org/10.3382/pfp.2019-0491>
- [02] **Erickson, M.G.**, Karcher, E.L., & Guberman, D. (2019). Interest and active learning techniques in an introductory animal sciences course. 63, 293-298. *North American College Teachers of Agriculture Journal*. <https://www.jstor.org/stable/26769653>
- [01] Worden, L., **Erickson, M.G.**, Gramer, S., Tap, C., Ylioja, C., Trottier, N., Preseault, C.L., VandeHaar, M.J., Lock, A.L., & Karcher, E. (2018). Short communication: Decreasing the dietary ratio of n-6 to n-3 fatty acids increases the n-3 concentration of peripheral blood mononuclear cells in weaned Holstein heifer calves. *Journal of Dairy Science*, 101(2), 1227-1233. <https://doi.org/10.3168/jds.2017-12696>

- [26] **Erickson, M.G.**, Cortus, E.L., Koelsch, R., Johnson, L., Wilson, M., Andersen, D., Zelt, M., and A.M. Schmidt. (*Submitted 01/2025*). Manure use benefits and barriers according to agricultural stakeholders. *Agronomy Journal*.
- [25] Cortus, E.L., **Erickson, M.G.**, Mueller, S., Breker, J., Urriola, P.E., Wilson, M., and M. Wilson (*Submitted 01/2025*). Chloride concentrations in solid and liquid manure from Minnesotan swine, dairy, and beef facilities. *Applied Engineering in Agriculture*.
- [24] Viquez-Umana, F.L., **Erickson, M.G.**, Young, J., Zanton, G.I., Wattiaux, M.A., Suen, G., & H.C. Mantovani (*Submitted 01/2025*). Assessing the impact of oscillating dietary crude protein on the stability of the rumen microbiome in dairy cattle. *Frontiers in Microbiology*.
- [23] **Erickson, M.G.** and E.L. Cortus. (*Submitted in 2024*). Livestock systems as complex and sociomaterial – new directions for research and practice on farm environmental sustainability initiatives. *Elementa: Science of the Anthropocene*.
- [22] Warmka, A., **Erickson, M.G.**, and E.L. Cortus (*Submitted in 2024*). Applying a Mass Balance Approach to Minnesota Deep-Pit Swine Barns to Estimate Ammonia Emissions. *Journal of Biosystems Engineering*.
- [21] **Erickson, M.G.**, M. Rovai, P. Villamediana, A.M. Schmidt, R.R. Stowell, and E.L. Cortus. (*Submitted in 2024*). Building value for dairy farmers and advisors in the Farmers Assuring Responsible Management Environmental Stewardship Program. *Translational Animal Science*.

ACTIVE PROJECTS

- ⇒ **Critical conversations and engagement on environmental stewardship in agriculture** *Collaboration with:* N.C. Soriano, B. Hu, and E.L. Cortus. This project uses a low-cost, fast turnaround laboratory assay to estimate the instantaneous emission rates of methane, carbon dioxide, and hydrogen sulfide from stored manure. We anticipate the assay can contribute to farm-specific and time-specific environmental monitoring. I recruited 28 dairies and am coordinating quarterly sampling, data collection, laboratory analysis, and communication with participants.
- ⇒ **Comparison of mass balance estimation and aerial emission measurement of ammonia and greenhouse gases** *Collaboration with:* N.C. Soriano, E.L. Cortus. We are comparing estimates and uncertainties based on mass balances (using herd records and samples of feed, manure, bedding) with direct aerial emission monitoring via a trailer with air quality instrumentation.
- ⇒ **Dairy H5N1 biosecurity** *Collaboration with:* I. Haagen, A. Schuft. Recent outbreaks of highly-pathogenic avian influenza in dairy cattle have illustrated opportunities to improve dairy biosecurity practices. Our upcoming survey (2025) will characterize current conceptual, structural, and procedural biosecurity practices on Minnesotan dairy farms. Findings will inform targeted Extension work.

Grants

Pending for 2025-2028 as Project Director or Co-Project Director: **\$1,119,595**
 Funded grants written during Ph.D.: **\$119,616**

Term	Details	Status	Amount
Fall 2024	(Project Director) SARE Research & Education Grant. <i>Empowering dairy goat producers with environmental data, impacts and insights.</i>	In review; pre-proposal advanced	250,000
""	(Co-Project Director) USDA NIFA Foundational Grant. <i>Improving manure production prediction and measurement.</i>	In review	644,627
Sum. 2024	(Project Director) USDA NIFA Postdoctoral Grant. <i>Managing variability throughout nutritional processes on dairies.</i>	In review	224,968
""	(Contributor) USDA AFRI Commodity Board Co-Funding Topic. <i>Hydrothermal carbonization of dairy manure digestate to improve bedding and fertilizer value.</i>	In review	300,000
Spr. 2024	(Senior Personnel) Sustainable Agriculture Systems. <i>Quantifying and transforming agricultural and food industry from linear to circular bioeconomic systems</i>	In review	10,000,000
""	(Co-Project Director) Rapid Agriculture Response Fund: <i>Securing Minnesota's Dairy Future: Biosecurity for H5N1 risk reduction.</i>	Not funded	25,000
""	(Co-Project Director) National Pork Board Extension and Outreach Grant. <i>Building value around sustainability assessments</i>	Not funded	80,491
Fall 2023	(Project Director) Institute on the Environment Mini-Grant. <i>Evolving environmental sustainability storylines in livestock production</i>	Not funded	3,000
Spr. 2023	(Contributor) Farmers Advocating For Organics Grant. <i>Integrating sustainability dimensions of organic dairies</i>	Not funded	47,576
Fall 2021	(Lead Writer) Hatch Formula Grant. <i>Uncovering the role of plasma free amino acids in ruminal and post-absorptive nitrogen use efficiency in lactating dairy cows.</i>	Funded	77,630
Spr. 2021	(Contributor) USDA Higher Education Challenge Grant. <i>Data-driven modernization of the dairy science curriculum.</i>	Not funded	174,943
""	(Lead Writer) Dairy Innovation Hub Short-Term High Impact Grant. <i>Charting a path for public engagement on dairy sustainability goals.</i>	Not funded	49,636
""	(Lead Writer) Dairy Innovation Hub Equipment Grant. <i>High-resolution rumen physiological data through continuous monitoring with indwelling loggers.</i>	Funded	16,986

(continued)

Term	Details	Status	Amount
""	(Lead Writer) Atwood Faculty Fellowship. <i>Post-pandemic interdisciplinary teaching and learning with topical modules and a faculty guidebook rooted in CALS 'Priority Themes'</i>	Funded	20,000
Fall 2020	(Lead Writer) Dairy Innovation Hub Short-term High Impact Grant. <i>In-line milk urea nitrogen (iMUN): A tool for nitrogen management of Wisconsin dairy farms.</i>	Not funded	116,626
Spr. 2020	(Contributor) University of Wisconsin Instructional Continuity Grant. <i>Using Gather.town to promote virtual community.</i>	Funded	5,000
Fall 2018	(Fellow, Lead Writer) National Science Foundation Graduate Research Fellowship Program.	Honorable Mention	150,000

Research Presentations and Abstracts

33 presentations to US and international scientific audiences including 3 invited talks

*Denotes a presenting author other than me.

[33] **Erickson, M.G.** (2024, Sept. 19). Dietary protein level and feeding pattern: effects on lactating cow productivity and environmental outputs. Invited Talk at the Minnesota Nutrition Conference in Mankato, MN, USA.

[32] **Erickson, M.G.**, Schmidt, A.M., Stowell, R.R.*, Rovai, M., Villamediana, P., & E.L. Cortus (2024, July 28). Exploring next steps and support systems for dairy environmental sustainability in the Upper Midwest. Poster at American Society of Agricultural and Biological Engineers Annual Meeting, Anaheim, CA, USA.

[31] Ronk, E., **Erickson, M.G.**, Pizarro, D.*, & M.A. Wattiaux (2024, June 25). Careers and curricular topics that interest introductory animal and dairy science students. Poster at the North American College Teachers of Agriculture Annual Meeting in Wooster, OH, USA.

Featured
Presentations

[30] **Erickson, M.G.**, Rovai, M., Villamediana, P., Schmidt, A.M., Stowell, R.R., & E.L. Cortus (2024, June 17). Building value in sustainability assessments for dairy farmers and advisors: A qualitative analysis. Presentation at the American Dairy Science Association Annual Meeting, West Palm Beach, FL, USA.

[29] **Erickson, M.G.**, Schmidt, A.M., Stowell, R.R., Rovai, M., Villamediana, P., & E.L. Cortus (2024, April 12). Opportunities for collaborative implementation of environmental management strategies on dairies in the Upper Midwest. Presentation at American Society of Agricultural and Biological Engineers North Central Regional Meeting, Brookings, SD, USA.

Research Presentations and Abstracts (cont.)

- [28] Viquez, F.*, **Erickson, M.G.**, Zanton, G.I., Wattiaux, M.A., Suen, G., and H. Mantovani. Microbial community structure of dairy cattle is stable through oscillating crude protein inclusion (2024, March 10). Poster presented at the American Society of Animal Science Midwest Section Meeting in Madison, WI, USA. <https://doi.org/10.1093/jas/skae102.387>
- [27] **Erickson, M.G.**, Rovai, M., Villamediana, P., Schmidt, A.M., Stowell, R.R., & E.L. Cortus (2024, April 5). Implementation networks for regenerative cropping practices on dairy systems in the Upper Midwest. Poster at Regenerative Livestock Symposium, St. Paul, MN, USA.
- [26] Wattiaux, M.A.*, Pizarro, D., **Erickson, M.G.**, & C.A. Gomez. Using The Sustainable Development Goals to Guide Research in Agricultural and Food Systems. (2023, May 31-June 3). VII Wallace Conference. Costa Rica. CATIE, Turrialba, Costa Rica. <https://repositorio.catie.ac.cr/handle/11554/5175>
- [25] Pizarro, D.*, **Erickson, M.G.**, D. Lucantoni, A. Mottet, C.A. Gomez, & M.A. Wattiaux. Some smallholders in Peru keep more trees on the farm than others—what else is going on? (2023, April 25). College of Agricultural and Life Sciences Global Day, Madison, WI, USA.
- [24] Pizarro, D.*, **Erickson, M.G.**, D. Lucantoni, A. Mottet, & M.A. Wattiaux. Agroecological transition and holistic sustainability of smallholder dairy cattle systems. (2023, June 4-8). International Symposium on the Nutrition of Herbivores in Florianopolis, Brazil.
- [23] **Erickson, M.G.**, Zanton, G.I., & M.A. Wattiaux. (2023, June 27). Effects of level and oscillation of dietary crude protein on ruminal conditions. Poster at the American Dairy Science Association Annual Meeting in Ottawa, Ontario, Canada.
- [22] **Erickson, M.G.**, Hanigan, M.D., & Wattiaux, M.A. (2023, June). *Invited Symposium Talk: Teaching with the narrative and model in NASEM (2021) “Nutrient Requirements of Dairy Cattle.”* Presentation at the American Dairy Science Association Annual Meeting in Ottawa, Ontario, Canada. *J. Dairy Sci.* 106(Suppl. 1), 43.
- [21] Ronk, E.*, **Erickson, M.G.**, & Wattiaux, M.A. (2023, June). Emerging topics and pedagogies in animal and dairy science: a survey of student preferences. Presentation at North American College Teachers of Agriculture Annual Meeting in Las Cruces, NM.
- [20] Ronk, E.*, **Erickson, M.G.**, & Wattiaux, M.A. (2023, May 18). Accounting for changing student preferences in animal and dairy science curriculum and pedagogy. Presentation at University of Wisconsin–Madison Teaching Symposium.
- [19] Pizarro, D.M.*, **Erickson, M.G.**, Gomez, C., & Wattiaux, M.A. (2022, Oct. 26). Measuring Agroecological Performance of Dairy Cattle Systems in the Peruvian Amazon. University of Wisconsin–Madison Sustainability Symposium.
- [18] **Erickson, M.G.**, Zanton, G.I., & M.A. Wattiaux. (2022, June 22). Effects of dietary crude protein level and feeding pattern on nutrient digestibility and nitrogen balance. Poster presented at American Dairy Science Association Annual Meeting in Kansas City, MO.

Research Presentations and Abstracts (cont.)

- [17] **Erickson, M.G.**, Zanton, G.I., & M.A. Wattiaux. (2022, June 21). Effects of dietary crude protein level and feeding pattern on milk production. Presentation at American Dairy Science Association Annual Meeting in Kansas City, MO. *J. Dairy Sci.* 105(Suppl. 1), 92.
- [16] **Erickson, M.G.** & M.A. Wattiaux. (2022, June 21). Invited Symposium Talk: Educational psychology methods to advance teaching scholarship and improve student learning in dairy science. Presentation at American Dairy Science Association Annual Meeting in Kansas City, MO.
- [15] **Erickson, M.G.**, Pizarro, D.P., Zanton, G.I., & M.A. Wattiaux. (2022, June 6). Methane and carbon dioxide production of lactating Holsteins cows with different crude protein feeding strategies. Poster presented at Greenhouse Gas & Animal Agriculture Annual Meeting in Orlando, FL.
- [14] **Erickson, M.G.**, Schroeder, L., Zoerb, H.*, & Wattiaux, M.A. (2021, Nov. 18). A dairy innovation challenge for students and industry mentors. Poster presented by H. Zoerb at the Dairy Innovation Hub Symposium in Madison, WI.
- [13] Simmermeyer, E.*, **Erickson, M.G.**, & E.L. Karcher. (2021, June 14). Situational interest and intrinsic motivation in various remote teaching formats. Presentation at North American College Teachers of Agriculture virtual Annual Meeting.
- [12] Wattiaux, M.A., **Erickson, M.G.**, & Pizarro, D. (2021, July 12). Discussion-based strategies for remote teaching and learning. Workshop presented at the American Dairy Science Association virtual Annual Meeting.
- [11] **Erickson, M.G.**, Schroeder, L., Zoerb, H., & Wattiaux, M.A. (2021, June 14). Concept-testing a dairy innovation challenge for university students and dairy industry mentors. Poster presented at North American College Teachers of Agriculture virtual Annual Meeting.
- [10] **Erickson, M.G.**, Wickenhauser, J.L., Simmermeyer, E., Wattiaux, M.A., & Karcher, E.L. (2021, June 14). Making science reading motivating: comparing post-reading support activities. Presentation at North American College Teachers of Agriculture virtual Annual Meeting.
- [09] **Erickson, M.G.**, Marks, D., Karcher, E.L., & Wattiaux, M.A. (2020, July 19). Validating adapted scales to measure interest in animal science. Poster presented at American Society of Animal Science Annual Meeting.
- [08] **Erickson, M.G.**, Marks, D., Karcher, E.L., & Wattiaux, M.A. (2020, June 16). Brief written reflections improve interest of introductory animal science students: a randomized controlled intervention study. Presentation at North American College Teachers of Agriculture virtual Annual Meeting.
- [07] **Erickson, M.G.**, Knobloch, N.A., Karcher, D.M., Erasmus, M., Karcher, E.L. (2019, June 19). Poultry in the Classroom: effectiveness of an online poultry-science-based education program for high school STEM instruction. Presentation at the Poultry Science Association Annual Meeting in Montreal, Quebec.

Research Presentations and Abstracts (cont.)

- [06] **Erickson, M.G.**, Karcher, E. L. (2019, June 19). Motivational effects of hands-on, problem-based, and lecture activities in an introductory college course. Presentation at North American College Teachers of Agriculture in Twin Falls, ID.
- [05] **Erickson, M.G.**, Karcher, E. L., Zhu, H., & Guberman, D. (2019, June 19). Poultry in the Classroom: effectiveness of an online poultry-science-based education program for high school STEM instruction. Presentation at North American College Teachers of Agriculture in Twin Falls, ID.
- [04] **Erickson, M.G.**, Karcher, E. L., & Guberman, D. (2018, October 25). Partnering faculty with undergraduate teaching assistants in an introductory animal science course. Presentation at International Society for the Scholarship of Teaching and Learning in Bergen, Norway.
- [03] **Erickson, M.G.**, Karcher, E. L., Zhu, H., & Guberman, D. (2018, June 14). Active Learning Strategies Impact Curiosity in an Introductory Animal Sciences Course. Presentation at North American College Teachers of Agriculture in Ames, IA.
- [02] **Erickson, M.G.**, Donkin, S.S. (2017, April 13). In Search of an Optimal Glucose Tolerance Testing Protocol for Assessing Glucose Kinetics and Metabolic Status in Dairy Cows. Presentation at Tri-State Dairy Nutrition Conference in Fort Wayne, IN.
- [01] **Erickson, M.G.**, Baker S., Vezzoli G., Hester P., Makagon M. Effect of perch material on perch use, hen welfare and egg production. Poultry Science Association Annual Meeting Proceedings; 2015 July 27-30; Louisville, KY.

Awards & Honors

University of Wisconsin–Madison Dorothy Powelson Teaching Award 2022

This campus-wide award recognized my excellence in natural science teaching as the primary instructor of introductory animal science laboratories and a co-instructor of two upper-level courses. The award was based on the depth of teaching assignments at UW–Madison, involvement in teaching-focused mentoring, student evaluations of teaching skills, student comments, and my teaching philosophy.

American Society of Animal Science, Program Chair Poster Pick 2020

My research *Validating adapted scales to measure individual and situational interest in animal science undergraduates* was honored by the program chair to recognize its interest to the Animal Science community.

Purdue University College of Agriculture Pathmaker Research Mentoring Award 2019

I received this college-level award for distinguishing myself as “an effective mentor and peer coach by unselfishly investing in the success of fellow graduate students and/or undergraduate researchers-in-training.”

North American College Teachers of Agriculture Graduate Teacher Award 2019

I was co-nominated for this national award by Dr. Mark Russell (Head of Agricultural Sciences Education and Communication) and Dr. Elizabeth Karcher (Professor in Animal Sciences). It recognized my development of K-12 educational programming, my involvement in the Animalia Learning Community, and my leadership as a laboratory instructor. The award was based on faculty and student evaluations of my teaching ability and my teaching philosophy.

Purdue University Department of Animal Science, Graduate Teaching Award 2019

This departmental award recognized my contributions to redesigning, coordinating, and conducting research on a large-enrollment introductory animal science course and developing an undergraduate students-as-partners in teaching program.

Center for Instructional Excellence Teaching Academy Graduate Teaching Award 2019

This campus-wide award recognized my contributions to significant curricular and pedagogical advancement in Purdue University’s Animal Science department.

North American College Teachers of Agriculture Travel Grant 2019

Poultry Science Association Certificate of Excellence for Oral Presentation 2019

International Society for the Scholarship of Teaching & Learning Emerging Scholar 2018

North American College Teachers of Agriculture Travel Grant 2018

Teaching and Curriculum Development

Five years as the primary instructor for large-enrollment *Introduction to Animal Agriculture* laboratories; **Three years** as a co-instructor for two award-winning upper-level courses *Food Systems and Sustainability* and *Animal Agriculture and Global Development*.

Term	Course	Role	N.Enrolled
Spr. 2022	DySci 47200	Teaching Assistant	35
Spr. 2022	DySci 47100	Teaching Assistant	59
Fall 2021	AnSci 10100	Laboratory Instructor of Record	96
Spr. 2021	DySci 47200	Teaching Assistant	32
Spr. 2021	DySci 47100	Teaching Assistant	32
Fall 2020	AnSci 10100	Laboratory Instructor of Record	80
Spr. 2020	DySci 47200	Teaching Assistant	22
Spr. 2020	DySci 47100	Teaching Assistant	28
Fall 2019	AnSci 10100	Laboratory Instructor of Record	84
Spr. 2019	AnSci 10200	Laboratory Instructor, Laboratory Coordinator	96
Fall 2018	AnSci 10200	Laboratory Instructor, Laboratory Coordinator	178
Fall 2017	AnSci 10200	Laboratory Instructor, Laboratory Coordinator; Lecture Teaching Assistant	238
Total Enrollment			980

BOOKS & BOOK CHAPTERS

[01] **Erickson, M.G.** & Thompson-Hajdik, A. L. (2021). Small ruminant health and management. In E.L. Karcher (Ed.), *Introduction to Animal Sciences*. Dubuque: Greater River Learning.

GUEST LECTURES

- *Animal nutrition and the environment* (2024, Dec. 6). University of Minnesota Animal Nutrition 2401. Lecture for approximately 50 students.
- *Building value in dairy sustainability assessments for farmers and advisors* (2024, March 18). University of Minnesota Ruminant Seminar. Lecture for approx. 20 attendees.
- *Dairy manure management systems* (2024, March 27-28). South Dakota State University. Dairy Production. Lecture and Laboratory for approx. 20 students.
- *Small ruminant management* (2023, Fall). University of Wisconsin–Madison. Lecture for approx. 140 students.
- *Small ruminant management* (2022, Fall). University of Wisconsin–Madison. Lecture for approx. 100 students.

Teaching and Curriculum Development (cont.)

TEACHING TIPS

- [05] **Erickson, M.G.**, Cortus, E.L., and M.A. Wattiaux. (2024). Creating interactive online course directories. <https://doi.org/10.56103/nactaj.v68iTT.207>
- [04] Fricke, R.A., **Erickson, M.G.**, & E. Ronk. (2021). TA Tip: Remote-teaching strategies that keep introductory animal sciences students engaged and actively learning. https://nactarchives.org/images/TeachingTips/2021/TT_2020-0327.pdf
- [03] Bartelt, K., **Erickson, M.G.**, & E. Ronk. (2021). TA Tip: Making the most of the chat box. https://nactarchives.org/images/TeachingTips/2021/TT_2021-0328.pdf
- [02] Gille, J.L., **Erickson, M.G.**, & E. Ronk. (2021). TA Tip: Promoting student-student and student-instructor interactions virtually. https://nactarchives.org/images/TeachingTips/2021/TT_2020-0314.pdf
- [01] **Erickson, M.G.**, & M.A. Wattiaux. (2020). Redesigning a flipped classroom for 100% remote delivery. https://nactarchives.org/images/TeachingTips/2020/TT_2020-0195_FOR_WEB.pdf

EDUCATIONAL RESOURCES

Co-designer and developer of: Resources for teaching interdisciplinary agriculture in higher education (2025, anticipated). A faculty handbook and compendium of activities centered on nine topics.

Re-designer of: n = 12 pre-laboratory (0.5 hr), in-laboratory (2-3 hr), and post-laboratory (0.5 hr) activities, several lecture case studies, and a small ruminant health lecture for introductory Animal & Dairy Sciences students.

Designer and developer of: Poultry in the classroom (2019). Seven 30-minute interactive online modules including interactive simulation games for High School STEM students.

Mentoring

Across **73 mentee-semesters** in **seven years** of mentorship on research and teaching, I supported undergraduates in securing funding and completing independent research projects, championed their contributions to peer-reviewed teaching articles (see Teaching Tips), and published research on a program I developed to involve students as partners in teaching (see Publications, #04).

Term	Description	N.Mentees
Spr. 2025	Continuing mentorship of 3 undergraduates (K.B., S.M., J.O., S.M.) and mentorship of an additional student (R.K.), involved in laboratory and analytical work on manure storage emissions.	5
Fall 2024	Continuing mentorship of 2 undergraduates (K.B., S.M.) and mentorship of an additional student (J.O.), involved in laboratory and analytical work on manure storage emissions.	3
Sum. 2024	Continuing mentorship of 1 undergraduate (K.B.) in laboratory analysis of manure. Mentorship of an undergraduate (S.H.) on field work and writing a literature review. I mentored each in developing and presenting on their own independent research project.	2
Spr. 2024	1 undergraduate (K.B.) mentored in laboratory analysis of manure; continuing mentorship of an undergraduate (S.M.) in data analysis and writing for a publication.	2
Fall 2023	1 undergraduate (S.M.) mentored through data analysis for a publication.	1
Spr. 2023	1 undergraduate researcher in Microbiology (A.S.) assisting in extracting and sequencing rumen microbial DNA. 1 undergraduate mentored through the COMPASS program.	2
Fall 2022	1 undergraduate mentored through the COMPASS program.	1
Spr. 2022	No undergraduates mentored outside of teaching.	-
Fall 2021	3 undergraduate researchers continuing work described in Spr. – Sum. 2021. 2 undergraduate facilitators of AnSci 101 who I mentored through weekly meetings and a guided reflective report on their teaching practice.	5
Spr. 2021 - Sum. 2021	1 undergraduate researcher (H.H.) awarded a Farrington Grant to complete a research project on dairy cattle urine preservation methods for nitrogen balance studies. 2 undergraduate researchers involved in on-farm sample collection and laboratory analysis (S.Z., S.F.)	3
Fall 2020	Undergraduate facilitators of AnSci 101 who I mentored during weekly meetings and through developing a short teaching technical note (listed in "Teaching Tips/Technical Notes" below)	3
Spr. 2020	No undergraduates mentored during COVID-19-related closures.	-
Fall 2019	Undergraduate facilitators of AnSci 101 who I mentored during weekly meetings and through a reflective written report evaluating their own teaching practice in the course.	6

(continued)

Term	Description	N.Mentees
Spr. 2019	13 Undergraduate facilitators of AnSci 102 who I mentored through designing a suite of laboratory educational materials, including assessment and feedback; 1 undergraduate researcher in Animal Sciences (M.E.) who evaluated and presented on educational materials they developed.	14
Fall 2018	Undergraduate facilitators of AnSci 102 who I mentored through developing and assessing a suite of laboratory educational materials. These facilitators also completed a series of biweekly teaching development reflective practice activities which I created.	15
Spr. 2018	2 undergraduate Computer Science students involved in development of a simulation game I designed; 1 undergraduate researcher in Animal Sciences (S.T.) who I mentored in pilot testing and presenting the results of the simulation game.	3
Fall 2017	Undergraduate facilitators of AnSci 102 who I mentored through designing a suite of laboratory educational materials, including assessment and feedback.	13
Total mentee-semester		78

Extension and Outreach

ACTIVE PROJECTS

⇒ **Building value in baselines: Conversations on the FARM ES Program.** *Collaboration with:* M. Rovai, P. Villamediana, R. Stowell, A. Schmidt, and E.L. Cortus. This project convened dairy producers and advisors for 14 in-person focus groups in five dairy-intensive regions in Minnesota, South Dakota, and Nebraska. Each focus group included 5-10 participants and lasted 1.5 to 3 hours. I facilitated or co-facilitated all of the focus groups and am coordinating qualitative analysis (publication submitted in 2024) and program evaluation.

INVITED EXTENSION PRESENTATIONS AND PODCASTS

*Denotes a main presenting author other than me.

- [08] Cortus, E.L.* and **Erickson, M.G.** (2024, Nov. 14). Exploring on-farm greenhouse gas measurement methods. Presentation for the Dairy Sustainability Alliance in St. Paul, MN, USA. Multi-stakeholder audience consisting of representatives from dairy companies interested in environmental, social, and governance management.
- [07] **Erickson, M.G.** (2024, Nov. 14). Shared experiences in environmental sustainability assessment. Presentation for the Dairy Sustainability Alliance in St. Paul, MN, USA. Multi-stakeholder audience consisting of representatives from dairy companies interested in environmental, social, and governance management.
- [06] **Erickson, M.G.** (2024, Nov. 14). Improving sustainability through nutritional management. The Dairy Podcast Show. Audience of dairy nutritionists and technical service providers.
- [05] **Erickson, M.G.** (2024, Oct. 22). Goat Dairying in an Age of Climate Change. Invited Talk at the American Dairy Goat Association Annual Convention in Lake Geneva, WI, USA. Audience of dairy goat producers and goat milk processors.
- [04] **Erickson, M.G.** & E.L. Cortus (2024, Sept. 26). Shared experiences in environmental sustainability assessment. Invited talk at the Upper Midwest Dairy Industry Association Conference in St. Cloud, MN, USA. Audience of milk processor representatives and processor leadership.
- [03] **Erickson, M.G.**, Rovai, M., Villamediana, P., Schmidt, A.M., Stowell, R.R., & E.L. Cortus (2024, July 22). Building value in sustainability assessments for dairy farmers and advisors: A qualitative analysis. Invited talk at the FARM Program Evaluators Conference in Lexington, KY, USA. Audience of environmental stewardship and animal welfare evaluators associated with milk processors and independent consulting agencies.
- [02] **Erickson, M.G.**, Zanton, G.I., & M.A. Wattiaux. (2023, July 5). Invited talk: Dietary crude protein oscillation in diets adequate and deficient in metabolizable protein. US Dairy Forage Webinar Series. Audience of dairy producers, nutritionists, and technical service providers.
- [01] **Erickson, M.G.** (2018, October 12). Dairy Goat Health and Husbandry. Invited talk presented at Ivy Tech Community College in Richmond, IN. Audience of goat producers and interested students.

Extension and Outreach (cont.)

POPULAR PRESS

Animal Health Digest, Editor	2017-2019
A History of the Indiana Dairy Industry by John Cleland, Editor	2017
Indiana Dairy Producers Newsletter, Editor-in-chief	2013-2015

Articles featured in: Progressive Dairy, United Caprine News: World's Leading Goat Periodical, USPOULTRY bulletin, WATT Ag, Indiana AgriNews, Indiana Prairie Farmer, VetAdvantage Magazine

EXTENSION RESOURCES

- [03] Cortus, E.L. and **Erickson, M.G.** (2024). Building value in Farmers Assuring Responsible Management Environmental Stewardship Assessments: Ideas and Actions for Processor Representatives. Print booklet.
- [02] Florentino, S., Lochner, H., Peterson, T. **Erickson, M.G.**, and E. Krekelberg (2024). Dairy goat safe handling. Video.
- [01] **Erickson, M.G.** (2024). Sustainability metrics. Article for www.sustainableanimalag.com.

Conservation Connect, Dairy Management Inc.: Contributor of two articles and Expert Reviewer of seven articles on diet reformulation, feed additives, and manure management practices. Articles are targeted to dairy producers and a variety of technical advisors across engineering, nutrition, and farm management.

Service Activities

REVIEWER FOR

Translational Animal Science
Journal of Dairy Science
Journal of Animal Science
Natural Sciences Education
North American College Teachers of Agriculture Journal

DEPARTMENT AND COLLEGE

Search Committee for Soil, Water, and Climate Researcher 6	2024
Regenerative Livestock Symposium Scientific Committee	2023-2024
Collaborative Mentorship Program for Animal Sciences (COMPASS)	2022-2023
Graduate Student Association Vice President	2022-2023
Climate and Diversity Committee Member	2020-2023
Graduate Student Association President	2021-2022
Graduate Student Association President	2017-2019

UNIVERSITY

Teaching Academy Executive Committee Member	2021-2023
Teaching Academy Feedback on Teaching Program Observer	2021-2023
UW–Madison Teaching Academy Future Faculty Partner	2021-2023
The Discussion Project, semester-long in-person program at UW–Madison	2020

PERSONAL

Wisconsin Dairy Goat Association, Volunteer	2019-Present
Therapy Dogs International, Volunteer	2018-Present
American Dairy Goat Association Genetic Advancement Committee	2017-2018
American Dairy Goat Association Youth Development Committee	2017-2018

ORGANIZATION

American Dairy Science Association Undergraduate Teaching Committee	2024-Present
Providing Opportunities for Women in Education Research	2022-Present

Development and Data Science

ACTIVE PROJECTS

- ⇒ **Decoding Dairy Diets.** *Collaboration with:* M.D. Hanigan, M.A. Wattiaux, D. Innes, L. Beckett. Create an online interactive textbook introducing nutritional and environmental modeling in R and Python based on NASEM (2021). A pilot version was shared at ADSA 2023: https://merickson3.github.io/NASEM_pilot/. My goal is to seek extramural funding for expanding this resource in 2025. I created the materials and am coordinating this effort.
- ⇒ **R package extending NASEM (2021).** *Collaboration with:* H. Lapierre, M.D. Hanigan. Develop and pilot test an R package (`dairynasem`) for advanced users of the NASEM (2021) dairy nutritional model. I wrote the package and documentation and am coordinating the project. The package and documentation will be released as a Technical Note. Beta version: <https://github.com/merickson3/dairynasem>

PROFICIENCIES

🇺🇸 R is my preferred programming language and I am an expert user and developer. I routinely use R for the following:

Exploratory data analysis: data visualization, correlation analysis

Hypothesis testing: analysis of variance, linear and generalized linear mixed models, non-linear models, time series analysis, power simulation, bootstrapping and permutation

Structural equation models: exploratory factor analysis, confirmatory factor analysis, latent growth analysis, latent profile analysis, latent cluster analysis

Uncertainty and sensitivity analysis

Dimensionality reduction and feature extraction: principal components and coordinates analysis, clustering and classification, variable selection

Various other: nutritional models, development of interactive learning resources, convenience functions for teaching, compilation of survey reports using Markdown/L^AT_EX

🇺🇸 SAS and 🇵🇾 Python I primarily use for teaching. I learned statistics through SAS and continue to use it for certain types of mixed models. Recently, I used these languages for the following:

Correlation analysis, analysis of variance, linear and generalized linear mixed models, time series analysis, covariance structure analysis

Exploratory data analysis, data visualization, basic nutritional modeling

OTHER SOFTWARE & TOOLS

Survey research and outreach: Qualtrics, Microsoft PowerBI

Dairy Management: PCDart, DairyComp, NRC/NASEM Nutritional Models, Integrated Farm Systems Model

Teaching: Canvas, Blackboard, Pressbooks, ArcGIS, Bookdown