

RICHARD R. STOWELL
Curriculum Vitae

Education: Ph.D., Agricultural Engineering, Michigan State University, May 1997
MS, Agricultural Engineering, University of Wisconsin - Madison, August 1988
BS, Agricultural Engineering, University of Wisconsin - Madison, December 1985

Title and Appointments: University of Nebraska – Lincoln:

Professor & Extension Specialist, July 2020 – present
Associate Professor & Extension Specialist, July 2007 – June 2020
Assistant Professor & Extension Specialist, January 2001 – June 2007

Biological Systems Engineering (70%) and Animal Sciences (30%)
Extension (75%), Teaching (25%)

Licensure: Professional Engineer, Wisconsin

Prior Employment Experience:

Instructor, Assistant Professor, 1996-2000
Food, Agricultural & Biological Engineering, Ohio State University
OSU Extension (80%), Ohio Agricultural Research and Development Center (20%)
Consultant, self-employed, 1994-95

Research and Teaching Program Areas:

Animal environment is the connecting thread of my educational programs and applied research. Areas of emphasis at UNL have included effects of climate variability on animal systems, ventilation [HVAC] system management and control within livestock facilities, air quality concerns and regulatory issues for animal production, use of odor impact assessment tools for planning livestock facilities, odor control technologies, and animal housing innovations.

Publications List

Peer-Reviewed Journal Articles:

- 1) Carlson, Z. E., L. J. McPhillips, R. R. **Stowell**, G. E. Erickson, M. Drewnoski, and J. C. MacDonald. 2023. Evaluation of growth performance, carcass characteristics, and methane and CO₂ emissions of growing and finishing cattle raised in extensive or partial-intensive cow-calf production systems. *J. Anim. Sci.* Jan 3 101: 1-10. <https://doi.org/10.1093/jas/skac368>. [Provided guidance on air monitoring and emissions calculation for intensive production system.]
- 2) Powers, C. A., T. Williams, and R. R. **Stowell**. 2021. Scenario planning for resilient agricultural systems: A process for engaging controversy. *J. of Extension* 59(3): 5. <https://doi.org/10.34068/joe.59.03.05>. [PI, oversaw project work and development of publication].
- 3) Judy, J. V., G. C. Bachman, T. M. Brown-Brandl, S. C. Fernando, K. E. Hales, P. S. Miller, R. R. **Stowell**, and P. J. Kononoff. 2019. Reducing methane with corn oil and calcium sulfate: responses on whole-animal energy and nitrogen balance in dairy cattle. *J. Dairy Sci.* 102(3): 2054–2067. <https://doi.org/10.3168/jds.2018-14567>. [Provided advice to graduate student / lead author on energy balance methodology, served on graduate committee, and critiqued draft publication.]
- 4) Powers, C., R. **Stowell**, J. Heemstra, J. Harrison, E. Whitefield, D. Smith, S. Mukhtar, J. Risse, P. Knox, G. Hawkins, C. Gooch, J. Pronto, D. Schmidt, and L. Jacobson. 2018. Building capacity to address animal agriculture in a changing climate. *J. of Extension* 56(1): Article 16. <https://tigerprints.clemson.edu/joe/vol56/iss1/16>. [Lead PI, oversaw project team work and development of this publication].
- 5) Judy, J. V., G. C. Bachman, T. M. Brown-Brandl, S. C. Fernando, K. E. Hales, P. S. Miller, R. R. **Stowell**, and P. J. Kononoff. 2018. Energy balance and diurnal variation in methane production as affected by feeding frequency in Jersey cows in late lactation. *J. Dairy Sci.* 101(12): 10899-10910. <https://doi.org/10.3168/jds.2018-14596>. [Provided advice to graduate student / lead author on energy balance methodology, served on graduate committee, and critiqued draft publication.]
- 6) Boyd, B. M., A. Jones, L. Franzen-Castle, K. Jenkins, R. Rasby, M. Luebbe, R. **Stowell**, S. C. Fernando, and G. E. Erickson. 2015. Case study: Producer concerns and perceptions regarding the effect of methane on cattle production and the environment: A survey of Nebraska producers. *The Professional Animal Scientist* 31(6): 601-607. <https://doi.org/10.15232/pas.2015-01425>. [Facilitated BOSR conducting and analyzing the survey, provided input to development of the survey instrument and interpretation of results.]
- 7) Cortus, E. L., M. R. Al Mamun, M. J. Spiehs, F. Y. Ayadi, B. E. Doran, K. D. Kohl, S. Pohl, S. D. Cortus, R. **Stowell**, and R. Nicolai. 2015. Site, environmental, and airflow characteristics for monoslope beef cattle facilities in the Northern Great Plains. *Transactions of the ASABE* 58(1): 123-135. <https://doi.org/10.13031/trans.58.10800>. [Provided primary internal technical review of methodology and manuscript.]
- 8) Spiehs, M. J., E. L. Cortus, G. A. Holt, K. D. Kohl, B. E. Doran, F. Y. Ayadi, S. D. Cortus, M. R. Al Mamun, S. Pohl, R. Nicolai, R. **Stowell**, and D. B. Parker. 2014. Particulate matter concentrations for mono-slope beef cattle facilities in the Northern Great Plains. *Transactions of the ASABE* 57(6): 1831-1837. <https://doi.org/10.13031/trans.57.10794>. [Provided internal technical review of methodology and manuscript.]
- 9) Harmon, J. D., M. C. Brumm, L. D. Jacobson, S. H. Pohl, D. R. Stender, and R. R. **Stowell**. 2012. Field performance evaluation of a ventilation system: A swine case study. *Applied Engineering in Agriculture* 28(2): 251-257. <https://doi.org/10.13031/2013.41342>. [Equal-share contributor to efforts of this 4-state team.]
- 10) Henry, C. G., G. E. Meyer, D. D. Schulte, R. R. **Stowell**, A. M. Parkhurst, R. E. Sheffield. 2011. Mask scentometer for assessing ambient odors. *Transactions of the ASABE* 54(2): 609-615.

<https://doi.org/10.13031/2013.36464>. [Supported much of graduate student's / lead author's research as a PI, served on graduate committee, and provided significant input to / feedback on reported work.]

- 11) Fritz, S., D. E. Husmann, D. E. Reese, R. R. **Stowell**, and L. A. Powell. 2007. High school students' perceptions of a College of Agricultural Sciences and Natural Resources. *NACTA Journal* 51: 44-49. Retrieved from <http://www.jstor.org/stable/43766939>. [Equally contributing member of study team that devised and assessed the surveys, presented the paper at NACTA Meeting.]
- 12) H. Sun, R. R. **Stowell**, H. M. Keener, and F. C. Michel. 2002. Two-dimensional computational fluid dynamics (CFD) modeling of air velocity and ammonia distribution in a High-rise™ hog building. *Transactions of the ASAE* 45(5): 1559-1568. <https://doi.org/10.13031/2013.11061>. [Provided technical guidance to graduate student, reviewed and made revisions to manuscript.]
- 13) Keener, H. M., D. L. Elwell, T. A. Menke, and R. R. **Stowell**. 2001. Design and performance of a High-rise™ hog facility manure drying bed. *Applied Engineering in Agriculture* 17(5): 703-709. <https://doi.org/10.13031/2013.6916>. [Co-PI in project, authored draft of air quality section, reviewed and made revisions to manuscript.]
- 14) Kacira, M., T. H. Short, and R. R. **Stowell**. 1998. A CFD evaluation of naturally ventilated, multi-span, sawtooth greenhouses. *Transactions of the ASAE* 41(3): 833-836. <https://doi.org/10.13031/2013.17222>. [Provided technical guidance to student throughout project, reviewed and made revisions to manuscript.]

Books and Book Chapters:

- 1) **Stowell**, R., T. Mader, and J. Gaughan. 2009. Environmental Management, Chapter 8 of *Livestock Energetics and Thermal Environmental Management*. pp. 181-209. Ed. Hahn, L. and J. Deshazer. American Society of Agricultural and Biological Engineers, St. Joseph, MI. <https://doi.org/10.13031/2013.28301>. [Coordinated authorship of chapter, wrote roughly 60% of material, and provided most of the editing.]
- 2) Bickert, W. G., B. Holmes, K. Janni, D. Kammel, R. **Stowell**, and J. Zulovich. 2000. *Dairy Freestall Housing and Equipment*, MWPS-7, Seventh Edition. Midwest Plan Service, Iowa State University, Ames, IA. [Provided revisions and new material for 1 of 9 chapters, reviewed remaining chapters].

Peer-Reviewed Proceedings Papers:

- 1) Short, T. H., I. Lee, and R. R. **Stowell**. 2001. Naturally ventilated greenhouse designs for optimum cooling. In: *V International Symposium on Protected Cultivation in Mild Winter Climates*, Eds. Fernandez, Martinez & Castilla. *Acta Hort.* (ISHS) 559: 177-182. <https://doi.org/10.17660/ActaHortic.2001.559.25>.
- 2) **Stowell**, R. R., H. Keener, D. Elwell, and S. Foster. 2000. Gaseous emissions from a High-rise™ hog facility. In: *Proceedings: Odors and VOC Emissions 2000*. Cincinnati, OH, April 4-6, 2000. CD, Water Environment Federation, Alexandria, VA 22314-1994.

Peer-Edited Proceedings Papers:

- 1) Morris, D. L., R. R. **Stowell**, T. M. Brown-Brandl, and P. J. Kononoff. 2018. Heat production of Jersey dairy cows measured via indirect calorimetry. In: *Proceedings of the Tenth International Livestock Environment Symposium*, ILES18-150. ASABE, St. Joseph, MI, USA. <https://doi.org/10.13031/iles.18-150>.
- 2) Funk, T. L., C. A. Gooch, R. R. **Stowell**, and J. Li. 2018. Annual electrical energy requirements of five cooling strategies for lactating dairy confined housing in the eastern United States. In: *Proceedings of the Tenth International Livestock Environment Symposium*, ILES18-125. ASABE, St. Joseph, MI, USA. <https://doi.org/10.13031/iles.18-125>.
- 3) Winders, T. M., B. M. Boyd, F. H. Hilscher, R. S. **Stowell**, S. C. Fernando, and G. E. Erickson. 2018. Evaluation of methane production manipulated by level of intake in growing cattle and corn oil in finishing cattle. In: *Proceedings of the Tenth International Livestock Environment Symposium*, ILES18-146. ASABE, St. Joseph, MI, USA. <https://doi.org/10.13031/iles.18-146>.
- 4) **Stowell**, R., J. Heemstra, R. Sheffield, E. Wheeler, D. Schulte, and K. Janni. 2012. Highlights of the Air Quality Education in Animal Agriculture project. In: *Proceedings of the Ninth International Livestock Environment Symposium*, ILES12-1906. ASABE, St. Joseph, MI, USA. <https://doi.org/10.13031/2013.41594>.
- 5) **Stowell**, R. R., J. Heemstra, D. D. Schulte, R. E. Sheffield, K. Janni, and E. F. Wheeler. 2010. Using webcasts to highlight air quality research. In: *Proceedings of International Symposium on Air Quality and Manure Management for Agriculture*. Pub # 711P0510cd. ASABE, St. Joseph, MI. <https://doi.org/10.13031/2013.32638>.
- 6) Harmon, J., M. Brumm, L. Jacobson, S. Pohl, D. Stender, and R. **Stowell**. 2008. The real world of ventilation troubleshooting: A swine case study. In: *Livestock Environment VIII*, Proceedings of the Eighth International Symposium, Ed. **Stowell**, R. R., E. F. Wheeler, and R. Gates. p. 661-665. ASABE, St. Joseph, MI, USA. <https://doi.org/10.13031/2013.25567>.
- 7) Pohl, S. H., J. D. Harmon, M. Brumm, R. R. **Stowell**, L. D. Jacobson, and R. Thaler. 2008. Assessment of ventilation management training workshops. In: *Livestock Environment VIII*, Proceedings of the Eighth International Symposium, Ed. **Stowell**, R. R., E. F. Wheeler, and R. Gates. p. 655-659. ASABE, St. Joseph, MI, USA. <https://doi.org/10.13031/2013.25566>.
- 8) **Stowell**, R., and M. C. Brumm. 2008. Behavioral responses of weaned pigs to differing zone-heating systems. In: *Livestock Environment VIII*, Proceedings of the Eighth International Symposium, Ed. **Stowell**, R. R., E. F. Wheeler, and R. Gates. p. 359-365. ASABE, St. Joseph, MI. <https://doi.org/10.13031/2013.25521>.
- 9) **Stowell**, R. R., C. G. Henry, R. K. Koelsch, and D. D. Schulte. 2007. Association of odor measures with annoyance: An odor-monitoring field study. In: *Proceedings of the International Symposium on Air Quality and Waste Management for Agriculture*. ASABE Publication Number 701P0907cd. ASABE, St. Joseph, MI, USA. DOI: 10.13031/2013.23893.
- 10) Schulte, D. D., M. R. Modi, C. G. Henry, R. R. **Stowell**, D. P. Billesbach, S. J. Hoff, and L. D. Jacobson. 2007. Modeling odor dispersion from a swine facility using AERMOD. In: *Proceedings of the International Symposium on Air Quality and Waste Management for Agriculture*, ASABE Publication Number 701P0907cd. ASABE, St. Joseph, MI, USA. DOI: 10.13031/2013.23894.
- 11) **Stowell**, R. R., L. Koppolu, D. D. Schulte, and R. K. Koelsch. 2005. Applications of using the Odor Footprint Tool. In: *Livestock Environment VII*, Proceedings of the Seventh International Livestock Environment Symposium, p. 496-503. Beijing, China, May 18-20, 2005. Ed. T. Brown-Brandl and R. G. Maghirang. ASAE, St. Joseph, MI, USA. <https://doi.org/10.13031/2013.18405>.
- 12) **Stowell**, R. R., C. A. Gooch, and W. G. Bickert. 2003. Design parameters for hot-weather ventilation of dairy housing: A critical review. In: *Proceedings of Fifth International Dairy Housing Conf.*, p. 218-226. Ed. K. A. Janni. ASAE, St. Joseph, MI. <https://doi.org/10.13031/2013.11625>.

- 13) Gooch, C. A., and R. R. **Stowell**. 2003. Tunnel ventilation for freestall facilities – Design, environmental conditions, cow behavior, and economics. In: *Proceedings of Fifth International Dairy Housing Conference*, p. 227-234. Ed. K. A. Janni. ASAE, St. Joseph, MI. <https://doi.org/10.13031/2013.11626>.
- 14) **Stowell**, R. R., H. Keener, D. Elwell, T. Menke, and S. Inglis. 2001. Indoor air quality and pig performance within a High-rise™ hog facility. In: *Livestock Environment VI*, Proceedings of the Sixth International Symposium, p.741-748. Louisville, KY, May 21-23, 2001. Ed. R. R. **Stowell**, R. Bucklin, and R. W. Bottcher. ASAE, St. Joseph, MI, USA. <https://doi.org/10.13031/2013.7138>.
- 15) **Stowell**, R. R., C. A. Gooch, and S. Inglis. 2001. Performance of tunnel ventilation for freestall dairy facilities as compared to natural ventilation with supplemental cooling fans. In: *Livestock Environment VI*, Proceedings of the Sixth International Symposium, p.29-40. Ed. R. R. **Stowell**, R. Bucklin, and R. W. Bottcher. ASAE, St. Joseph, MI. <https://doi.org/10.13031/2013.7057>.
- 16) **Stowell**, R. R., H. Keener, D. Elwell, T. Menke, and S. Foster. 2000. High-Rise™ Hog Facility. In: *Proceedings of the International Swine Housing Conference*, p. 273-282. Des Moines, IA, October 9-11, 2000. ASAE, St. Joseph, MI.
- 17) **Stowell**, R. R., W. G. Bickert, and F. V. Nurnberger. 1998. Radiant heating and thermal environment of metal-roofed dairy barns. In: *Proceedings of the Fourth International Dairy Housing Conference*, p. 193-200. St. Louis, MO, January 28-30, 1998. Ed. J. P. Chastain. ASAE, St. Joseph, MI.
- 18) **Stowell**, R. R., and W. G. Bickert. 1997. Heat stress characterization of dairy cattle in naturally ventilated barns using a thermal energy model. In: *Livestock Environment V*, Proceedings of the Fifth International Symposium, p.218-225. Bloomington, MN, May 29-31, 1997. Ed. R. W. Bottcher and S. J. Hoff. ASAE, St. Joseph, MI.
- 19) Bender, R., R. R. **Stowell**, and M. Veenhuizen. 1997. Natural ventilation alternative for two-story barns. In: *Livestock Environment V, Proceedings of the Fifth International Symposium*, p.743-747. Bloomington, MN, May 29-31, 1997. Ed. R. W. Bottcher and S. J. Hoff. ASAE, St. Joseph, MI.

Peer-Reviewed Extension Publications:

- 1) Gross, J., and R. **Stowell**. 2018. Fence and water development for effective grazing (EC 3035). Nebraska Extension, Institute of Agriculture and Natural Resources, Lincoln, NE.
- 2) Smith, D. W., S. Mukhtar, and R. **Stowell**. 2014. Advanced Application Techniques. Making the Most of Your Manure Responsibly, EBN-007. Texas A&M AgriLife Extension Bookstore. <http://www.agrilifebookstore.org/product-p/ebn-007.htm>.
- 3) Gross, J., R. **Stowell**, and C. Henry. 2014. Vegetative Treatment Systems Manual. University of Nebraska-Lincoln Extension, Institute of Agriculture and Natural Resources, Lincoln, NE.
- 4) Powers, C., D. Schulte, and R. **Stowell**. 2009. Carbon credits from livestock production. NebGuide G1962. University of Nebraska-Lincoln Extension, Institute of Agriculture and Natural Resources, Lincoln, NE.
- 5) Vantassel, S., S. Hygnstrom, D. Ferraro, and R. **Stowell**. 2009. Rodent-proof construction: structural. NebGuide G1530. University of Nebraska-Extension. 4 pp.
- 6) Sherwood, Dawn M., Galen E. Erickson, Terry J. Klopfenstein, Dennis D. Schulte, and Rick R. **Stowell**. 2007. Feedlot surface conditions and ammonia emissions. Nebraska Beef Cattle Report. MP-90:50-51. Institute of Agriculture and Natural Resources, University of Nebraska - Lincoln.
- 7) Henry, C., T. Mader, G. Erickson, R. **Stowell**, J. Gross, J. Harner, and P. Murphy. 2007. Planning a new cattle feedlot, Extension Circular EC777. University of Nebraska-Lincoln Extension.
- 8) **Stowell**, R. R., D. D. Schulte, R. K. Koelsch, and Chris Henry. 2006. Odor Footprint Tool progress: Regional output resources. 2006 Nebraska Swine Report, EC219 p. 15-21. Institute of Agriculture and Natural Resources, University of Nebraska - Lincoln.

- 9) Scheideler, S. E., and R. **Stowell**. 2006. The importance of proper ventilation for small poultry flocks, Extension NebGuide G1638. Cooperative Extension, University of Nebraska, Lincoln, NE.
- 10) Brumm, M. C., R. R. **Stowell**, and S. L. Colgan. 2005. Heating Systems for Wean-to-Finish Facilities. 2005 Nebraska Swine Report, EC 05-219-A, p. 31-35. Institute of Agriculture and Natural Resources, University of Nebraska - Lincoln.
- 11) **Stowell**, R., and C. Henry. 2004. The economic impacts of various public-policy scenarios for methane recovery on dairy farms. 2003-2004 Nebraska Dairy Report, MP82-A, p. 6-9. Institute of Agriculture and Natural Resources, University of Nebraska - Lincoln.
- 12) **Stowell**, R., S. Colgan, and M. Brumm. 2004. Thermal conditions within pens fitted with differing zone-heating options and resulting performance of newly weaned pigs in a wean-to-finish facility. 2004 Nebraska Swine Report, EC 04-219-A, p. 34-39. Institute of Agriculture and Natural Resources, University of Nebraska - Lincoln.
- 13) Hygnstrom, S. E., D. R. Virchow, D. M. Ferraro, and R. R. **Stowell**. 2003. Rodent-Proof Construction – Structural, NebGuide G03-1530-A. Cooperative Extension, University of Nebraska – Lincoln.
- 14) Hygnstrom, S. E., D. R. Virchow, D. M. Ferraro, and R. R. **Stowell**. 2003. Rodent-Proof Construction – Drains and Feeding Equipment, NebGuide G94-1217-A. Cooperative Extension, University of Nebraska – Lincoln.
- 15) **Stowell**, R. R., and C. Henry. 2003. The economic potential of methane recovery: Projected impacts of various public-policy scenarios. 2003 Nebraska Swine Report, EC 03-219-A, p. 52-55. Institute of Agriculture and Natural Resources, University of Nebraska, Lincoln, NE.
- 16) **Stowell**, R. R. 2002. Applicability of High-rise™ hog housing for finishing operations. 2002 Nebraska Swine Report, EC 02-219-A, p. 55-59. Institute of Agriculture and Natural Resources, University of Nebraska, Lincoln, NE.
- 17) Eastridge, M.L., and S. Steel (Ed.). [R. **Stowell**, Technical contributor]. 2001. Questions pertaining to large dairy enterprises in Ohio: Environment. Extension Fact Sheet AS-9-01. The Ohio State University Extension, Columbus, Ohio.
- 18) Strobel, B. R., and R. R. **Stowell**. 1999. Using a psychrometric chart to describe air properties. Extension factsheet, AEX-120-99. The Ohio State University, Columbus, OH 43210.
- 19) Strobel, B. R., R. R. **Stowell**, and T. H. Short. 1999. Evaporative cooling pads: use in lowering indoor air temperature. Extension factsheet, AEX-127-99. The Ohio State University, Columbus, OH 43210.
- 20) Butalia, T., P. Dyer, R. **Stowell** and W. Wolfe. 1999. Construction of livestock feedlot and hay storage pads using FGD material. Extension factsheet, AEX-332-99. The Ohio State University, Columbus, OH 43210.
- 21) Bender, R., and R. **Stowell**. 1998. Chimneys: A natural ventilation alternative for two-story barns. Extension factsheet, AEX 115-98. The Ohio State University, Columbus, OH 43210.
- 22) Arnold, G. J., R. R. **Stowell**, and B. Strobel. 1998. Pit ventilation systems for swine buildings. Extension factsheet, AEX 150-98. The Ohio State University, Columbus, OH 43210.
- 23) Mescher, T., K. Wolfe, R. **Stowell**, and H. Keener. 1997. Swine composting site selection. Extension factsheet, AEX 712-97. The Ohio State University, Columbus, OH 43210.
- 24) Mescher, T., K. Wolfe, S. Foster and R. **Stowell**. 1997. Swine composting facility design. Extension factsheet, AEX 713-97. The Ohio State University, Columbus, OH 43210.
- 25) **Stowell**, R. R., and W. G. Bickert. 1995. Storing & handling of sand-laden dairy manure, Extension bulletin, E-2561, Michigan State University, East Lansing, MI 48824.

Professional Meeting and other Non-refereed Conference Papers/Abstracts:

- 1) Ramos Sanchez, J.C., R. **Stowell**, A.M. Schmidt, M. Zelt, and L. Witt-Swanson. 2022. Manure treatment technology adoption by swine and dairy producers: Survey feedback. *Proceedings of the 2022 Waste-to-Worth Conference*, Oregon, OH, April 18-22, 2022. <https://lpec.org/manure-treatment-technology-adoption-by-swine-and-dairy-producers-survey-feedback/>.
- 2) Vempalli, S. V., E. Scott, J. A. Hickman, T. Canter, R. **Stowell**, T. Lim, L. Greenlee, J. Popp, and G. Thoma. 2022. A decision-support tool for the design and evaluation of manure management and nutrient reuse in dairy and swine farm facilities. *Proceedings of the 2022 Waste-to-Worth Conference*, Oregon, OH, April 18-22, 2022. <https://lpec.org/a-decision-support-tool-for-the-design-and-evaluation-of-manure-management-and-nutrient-reuse-in-dairy-and-swine-farm-facilities/>.
- 3) Scott, E., S. V. Vempalli, J. A. Hickman, J. Popp, R. **Stowell**, T. Lim, G. Thoma, and L. Greenlee. 2022. Evaluating costs and benefits of manure management systems for a decision-support tool. *Proceedings of the 2022 Waste-to-Worth Conference*, Oregon, OH, April 18-22, 2022. <https://lpec.org/evaluating-costs-and-benefits-of-manure-management-systems-for-a-decision-support-tool/>.
- 4) **Stowell**, R. 2019. Development of a livestock siting assessment matrix. In: *Proceedings of Waste to Worth 2019*. <https://lpec.org/development-of-a-livestock-siting-assessment-matrix/>.
- 5) **Stowell**, R., L. Wang-Li, and L. Zhao. 2018. Instructor experiences in implementing eCEAP eLearning curriculum. Abstract #247 in *NACTA Journal* 62(Supl. 1): 109. ISBN: 978-1-387-71616-6.
- 6) Zhao, L., A. D. Christy, L. Wang Li, X. Wang, R. **Stowell**, C. Powers, R. C. Noble, and M. Worku. 2018. Experiential learning in environmental control of animal production for minority students. Abstract #231 in *NACTA Journal* 62 (Supl. 1): 57. ISBN: 978-1-387-71616-6.
- 7) Christy, A. D., L. Zhao, E. Buck, X. Wang, A. Green, L. Wang Li, K. Zering, E. Oviedo, R. **Stowell**, C. Powers, R. C. Noble, and M. Worku. 2018. Technology-enhanced faculty development in controlled environment animal production. Abstract #233 in *NACTA Journal* 62 (Supl. 1): 57. ISBN: 978-1-387-71616-6.
- 8) Winders, T. M., B. M. Boyd, F. H. Hilscher, R. R. **Stowell**, S. C. Fernando, and G. E. Erickson. 2018. Evaluation of the effect of intake on methane production in growing cattle fed forage-based diets. *J of Animal Science*, 96(2): 219, <https://doi.org/10.1093/jas/sky073.405>.
- 9) Winders, T. M., B. M. Boyd, F. H. Hilscher, R. R. **Stowell**, S. C. Fernando, and G. E. Erickson. 2018. Evaluation of the effect of corn oil on methane production in finishing cattle. *J. of Animal Science*, 96(2): 231-232, <https://doi.org/10.1093/jas/sky073.429>.
- 10) Powers, C., and R. **Stowell**. 2017. Planning for resilience: Using scenarios to address potential impacts of climate change for the Northern Plains beef system. In: *Proceedings of Third International Conference on Livestock & Poultry Environmental Quality*. eXtension.
- 11) Powers, C., and R. **Stowell**. 2017. Talking climate with animal agriculture advisers. In: *Proceedings of Third International Conference on Livestock & Poultry Environmental Quality*. eXtension.
- 12) **Stowell**, R., and D. Miller. 2017. Digester effluent's agronomic and odor emission potential: A swine case study. In: *Proceedings of Third International Conference on Livestock & Poultry Environmental Quality*. eXtension.
- 13) Hawkins, G., D. Smith, R. **Stowell**, C. Powers, J. Heemstra, J. Harrison, E. Whitefield, S. Mukhtar, M. Risse, P. Knox, C. Gooch, J. Pronto, L. Jacobson, and D. Schmidt. 2016. Animal agriculture and climate change: Building capacity among extension educators working with livestock and poultry, Paper No. 2458283. Presented at 2016 ASABE Annual International Meeting, Orlando, FL. ASABE, St. Joseph, MI. DOI: 10.13031/aim.20162458283.

- 14) **Stowell**, R. 2016. Air quality issues and national extension efforts related to climate change and livestock. In: *Proceedings of Beef Methane Conference*, Nebraska Extension.
- 15) **Stowell**, R., C. Powers, J. Heemstra, J. Harrison, E. Whitefield, S. Mukhtar, D. Smith, M. Risse, P. Knox, G. Hawkins, C. Gooch, J. Pronto, L. Jacobson, and D. Schmidt. 2015. Animal agriculture in a changing climate: A national approach. In: *Proceedings of the Dairy Environmental Systems and Climate Adaptation Conference*, p. 47-51. Cornell University, Ithaca, NY.
- 16) Spiels, M. J., E. L. Cortus, G. A. Holt, K. D. Kohl, B. E. Doran, F. Y. Ayadi, S. D. Cortus, M. R. Al Mamun, S. Pohl, R. Nicolai, R. **Stowell**, and D. B. Parker. 2014. Particulate matter concentrations for mono-slope beef cattle facilities in the Northern Great Plains, Paper No. 141903510. Presented at the 2014 ASABE and CSBE/SCGAB Annual International Meeting, ASABE, St. Joseph, MI. DOI: 10.13031/aim.20141903510.
- 17) Jones, M., R. Rasby, S. Fernando, G. Erickson, M. Luebbe, K. Jenkins, J. McDonald, T. Klopfenstein, J. Larson, R. **Stowell**, C. Powers, and M. Anferson-Knott. 2013. Evaluation of 2013 survey of beef producers in Nebraska. *J. of Animal Sci.* Abstract 92 (E-Suppl 2): 351.
- 18) Whitefield, E., R. R. **Stowell**, C., M. Risse, P. Knox, G. Hawkins, J. Harrison, S. Mukhtar, D. Smith, L. Jacobson, D. Schmidt, C. Gooch, and J. Pronto. 2013. Animal agriculture for a changing climate – using new ways of educating extension agents. *Proceedings of the 5th Greenhouse Gases and Animal Agriculture Conference (GGAA 2013)* 4: 568. Cambridge University Press, New York, NY.
- 19) R. **Stowell**. 2013. Air quality regulations and how the research study relates to air quality reporting. *Proceedings of the Beef Facilities Conference*, p. 10-17. Iowa State University.
- 20) Kelly, A. M., A. Lammers, D. D. Jones, R. R. **Stowell**, R. M. Hoy, E. Curtis, and A. K. Pannier. 2013. Implementation of a ‘rapid design challenge’ in a cross-disciplinary senior capstone course and evaluation of device performance. *American Society for Engineering Education Conference Proceedings*.
- 21) **Stowell**, R. R., J. M. Heemstra, D. D. Schulte, R. A. Sheffield, E. F. Wheeler, and K. A. Janni. 2013. Highlights of the Air Quality Education in Animal Agriculture Project. *Proceedings of the Waste-to-Worth Conference*. <https://lpcelc.org/highlights-of-the-air-quality-education-in-animal-agriculture-project/>.
- 22) **Stowell**, R. R., J. M. Heemstra, R. E. Sheffield, E. F. Wheeler, D. D. Schulte, K. A. Janni. 2012. Highlights of the Air Quality Education in Animal Agriculture Project, Paper No. 121338091. Presented at the 2012 Annual ASABE International Meeting, Dallas, TX, ASABE, St. Joseph, MI. DOI: 10.13031/2013.41868.
- 23) Henry, C. G., G. E. Meyer, D. D. Schulte, R. R. **Stowell**, R. E. Sheffield. 2010. Mask scentometer for assessing ambient odors. Paper 1010041, Presented at the Annual ASABE International Meeting, Pittsburgh, PA, June 20-23. ASABE, St. Joseph, MI. DOI: 10.13031/2013.30041.
- 24) Powers, C. A., R. R. **Stowell**, and D. D. Schulte. 2009. Comparison of local to regional odor footprints. Presented at the 2009 ASABE Annual International Meeting, Reno, NV. Paper No. 095921. ASABE, St. Joseph, MI, USA. DOI: 10.13031/2013.26996.
- 25) **Stowell**, R., C. Henry, C. Powers, and D. Schulte. 2008. Siting animal production facilities and evaluating odor control options using the Odor Footprint Tool. In: *Proceedings Mitigating Air Emissions from Animal Feeding Operations Conference*, p. 2-6. Iowa State Univ., Ames, IA.
- 26) Niemeir, K. R., C. A. Powers, R. R. **Stowell**, and D. D. Schulte. 2008. Validating the Odor Footprint Tool using field data. Presented at 2008 Annual International ASABE Meeting, Providence, RI. Paper #084577. ASABE, St. Joseph, MI. DOI: 10.13031/2013.25110.

- 27) Henry, C. G., D. D. Schulte, R. K. Koelsch, R. R. **Stowell**, D. P. Billesbach, N. Ebrahim, A. M. Parkhurst, and D. B. Parker. 2006. Comparing field odor assessment methods with an atmospheric dispersion model for calibrating setback estimation tools for livestock. In: *Proceedings of Workshop on Agricultural Air Quality: State of the Science*. USDA CSREES, Washington, DC. p. 706-719, Ed. V. P. Aneja, W. H. Schlesinger, R. Knighton, G. Jennings, D. Niyogi, W. Gilliam, and C. S. Duke. North Carolina State University, Raleigh, NC.
- 28) Quinn, S., G. Erickson, T. Klopfenstein, R. **Stowell**, and K. Vander-Pol. 2006. Effect of phase feeding protein on cattle performance and nitrogen mass balance in the summer. *Journal of Animal Science*, Vol. 84: 121, Supplement 1.
- 29) Sherwood, D. M., G. E. Erickson, T. J. Klopfenstein, D. D. Schulte, and R. R. **Stowell**. 2006. Feedlot surface conditions and their effect on ammonia emissions measured by wind tunnels. *Journal of Animal Science*, Vol. 84: 122, Supplement 1.
- 30) **Stowell**, R. R., L. Koppolu, D. D. Schulte, and R. K. Koelsch. 2005. Applications the Odor Footprint Tool. ASAE paper # MC05-205. Presented at: Mid-Central ASAE Conference, St. Joseph, MO. ASAE, St. Joseph, MI, USA.
- 31) **Stowell**, R., S. Colgan, and M. Brumm. 2004. Zone heating for swine wean-to-finish facilities: A performance comparison. In: *New Trends in Farm Buildings*, Proceedings of the Internacional Symposium of the CIGR (CD), Ed. Meneses, J. F., L. L. Silva, F. Baptista, and V. F. da Cruz. Universidade de Evora, Evora, Portugal. R. Stowell 9
- 32) **Stowell**, R., and C. Gooch. 2004. Advantages and limitations of hot-weather ventilation systems that are based on air velocity design criteria. In: *New Trends in Farm Buildings*, Proceedings of the Internacional Symposium of the CIGR (CD), Ed. Meneses, J. F., L. L. Silva, F. Baptista, and V. F. da Cruz. Universidade de Evora, Evora, Portugal.
- 33) Gooch, C., and R. **Stowell**. 2004. Tunnel ventilation for freestall facilities – Design, environmental conditions, cow behavior, and economics. In: *New Trends in Farm Buildings*, Proceedings of the Internacional Symposium of the CIGR (CD), Ed. Meneses, J. F., L. L. Silva, F. Baptista, and V. F. da Cruz. Universidade de Evora, Evora, Portugal.
- 34) Pohl, S., R. Thaler, M. Brumm, R. Stowell, J. Harmon, D. Stender, J. Weiss, L. Johnston, and L. Jacobson. 2004. Use of a mobile ventilation laboratory (VL) for hands-on training of pork producers in building ventilation. *J. of Animal Science*, Jan 2004; 82: 46.
- 35) **Stowell**, R. R., and C. Henry. 2003. The economic impacts of various public-policy scenarios for methane recovery on dairy farms, Paper #034013. Presented at: ASAE Annual International Meeting, Las Vegas, NV, July 27-30, 2003. ASAE, St. Joseph, MI. DOI: 10.13031/2013.14086.
- 36) Duyson, R., G. Erickson, D. Schulte, and R. **Stowell**. 2003. Ammonia, hydrogen sulfide and odor emissions from a beef cattle feedlot, Paper #034109. DOI: 10.13031/2013.15037. Presented at: 2003 ASAE Annual International Meeting, Las Vegas, NV, July 27-30, 2003. ASAE, St. Joseph, MI.
- 37) **Stowell**, R. R., H. Keener, P. R. Goodrich, and S. Foster. 2002. Gas and odor emissions from High-rise™ and deep-pit swine finishing facilities, ASAE paper #02-4122. Presented at the 2002 ASAE Annual International Meeting Chicago, IL, July 28 - 31, 2002. ASAE, St. Joseph, MI, USA. DOI: 10.13031/2013.9527.
- 38) **Stowell**, R. R. 2002. Ventilation for nursery pigs. In: *Proceedings of The 43rd Annual George A. Young Swine Health and Management Conference*, p. 61-65. Dept. of Veterinary and Biomedical Sciences, University of Nebraska – Lincoln, Lincoln, NE.
- 39) **Stowell**, R. R., C. A. Gooch, S. Inglis, N. R. St. Pierre, and E. J. Beiler. 2002. Cow response to summer environmental conditions within tunnel-ventilated and naturally ventilated dairy freestall

facilities, Abstract #1648. In: Abstracts of the 2002 Joint Meeting, *J. of Dairy Science* Vol. 85, Supplement 1, p. 410.

- 40) **Stowell**, R. R., C. A. Gooch, and S. F. Inglis. 2001. Environmental conditions within tunnel-ventilated and naturally ventilated dairy freestall facilities, Paper No. 01-4099. Presented at: 2001 ASAE International Meeting, Sacramento, CA, July 30-August 1, 2001. ASAE, St. Joseph, MI.
- 41) **Stowell**, R. R., C. A. Gooch, S. F. Inglis, N. R. St. Pierre, and E. J. Beiler. 2001. Cow activity and performance within tunnel-ventilated and naturally ventilated dairy freestall facilities, Paper No. 01-4101. Presented at: 2001 ASAE International Meeting, Sacramento, CA, July 30-August 1, 2001. ASAE, St. Joseph, MI.
- 42) **Stowell**, R. R., S. F. Inglis, and H. Keener. 2001. Ammonia emissions and hydrogen sulfide levels during handling of manure-laden drying bed material in a High-rise™ hog facility, Paper No. 014093. DOI: 10.13031/2013.7461. Presented at: 2001 ASAE International Meeting, Sacramento, CA, July 30-August 1, 2001. ASAE, St. Joseph, MI.
- 43) Sun, H., R. R. **Stowell**, H. Keener, and F. Michel. 2001. Three-dimensional CFD model of air and ammonia distribution in a High-rise™ hog building, Paper No. 014040. Presented at: 2001 ASAE International Meeting, Sacramento, CA, July 30-August 1, 2001. ASAE, St. Joseph, MI. DOI: 10.13031/2013.7454.
- 44) Keener, H. M., R. R. **Stowell**, D. L. Elwell, F. C. Michel, and T. Menke. 2001. Operating performance of a High-rise™ hog facility. Presented at: Addressing Animal Production and Environmental Issues, International Symposium, Research Triangle Park, NC. Proceedings on CD, North Carolina State University, Raleigh, NC.
- 45) Keener, H. M., D. L. Elwell, J. A. Pecchia, F. C. Michel, and R. R. **Stowell**. 2001. Continuous vs. intermittent aeration of drying bed on moisture and N retention in manure from a High-rise™ hog facility, NABEC Paper No. 01-914. Presented at: CSAE/SCGR-NABEC Meeting at AIC 2001, Guelph, Ontario, Canada. CSAE/SCGR, Mansonville, QC.
- 46) **Stowell**, R. R., H. Heener, D. Elwell, T. Menke, and S. Foster. 2000. Environmental implications of High-Rise™ hog housing. In: *Food Animal Production Systems: Issues and Challenges*, Proceedings of the 2000 NCR Extension Specialist Triennial Workshop, p. 201-208. MidWest Plan Service, Ames, IA.
- 47) **Stowell**, R. R. 2000. Heat stress relief and supplemental cooling. In: *Dairy Housing and Equipment Systems: Managing and Planning for Profitability*, NRAES-129, p. 175-185. Natural Resource, Agriculture, and Engineering Service, Ithaca, NY 14853.
- 48) **Stowell**, R. R., and S. Inglis. 2000. Sand for bedding. In: *Dairy Housing and Equipment Systems: Managing and Planning for Profitability*, NRAES-129, p. 226-234. Natural Resource, Agriculture, and Engineering Service, Ithaca, NY 14853.
- 49) **Stowell**, R. R., H. M. Keener, D. L. Elwell, and S. Foster. 2000. Ammonia emissions from a High-Rise™ swine finishing facility, Paper #004080. Presented at: 2000 ASAE Annual International Meeting, Milwaukee, WI. ASAE, St. Joseph, MI 49085.
- 50) Sun, H., R. R. **Stowell**, H. M. Keener, D. L. Elwell, and F. C. Michel. 2000. Two-dimensional computational fluid dynamic (CFD) model of air and ammonia distribution in a High-Rise™ hog building (HRHB), Paper #004050. Presented at: 2000 ASAE Annual International Meeting, Milwaukee, WI. ASAE, St. Joseph, MI 49085.
- 51) Keener, K. M., H. M. Keener, R. W. Bottcher, R. D. Munilla, D. E. Elwell, and R. R. **Stowell**. 2000. Dust and odor emissions from a High-Rise™ swine finishing facility, Paper #004028. Presented at: 2000 ASAE Annual International Meeting, Milwaukee, WI. ASAE, St. Joseph, MI 49085.

- 52) Mescher, T., T. Menke, R. **Stowell**, M. Veenhuizen, and H. Keener. 1999. Design, performance, and economics of a High-rise™ swine finishing building, Paper #994107. Presented at: 1999 ASAE Annual International Meeting, Toronto, Ontario, Canada, July 18-21, 1999. ASAE, St. Joseph, MI.
- 53) Keener, H., D. Elwell, T. Menke, and R. **Stowell**. 1999. Design and management of a High-Rise™ hog facility manure drying bed, Paper #994108. Presented at: 1999 ASAE Annual International Meeting, Toronto, Ontario, Canada, July 18-21, 1999. ASAE, St. Joseph, MI 49085.
- 54) Strobel, B. R., A. J. Heber, and R. R. **Stowell**. 1999. A mobile monitoring system for measuring air quality from confined livestock facilities, Paper #993189. Presented at: 1999 ASAE Annual International Meeting, Toronto, Ontario, Canada, July 18-21, 1999. ASAE, St. Joseph, MI 49085.
- 55) Wolfe, K. E., and R. R. **Stowell**. 1999. Slump tests can predict the solids content of dairy manure and similar non-Newtonian fluids, Paper #994098. Presented at: 1999 ASAE Annual International Meeting, Toronto, Ontario, Canada, July 18-21, 1999. ASAE, St. Joseph, MI 49085.
- 56) Wolfe, K. E., and R. R. **Stowell**. 1999. Comparison of hoppers and hopper configurations for gravity flow systems, Paper #994099. Presented at: 1999 ASAE Annual International Meeting, Toronto, Ontario, Canada, July 18-21, 1999. ASAE, St. Joseph, MI 49085.
- 57) Wolfe, K. E., and R. R. **Stowell**. 1999. Developing a model to simulate the flow of dairy manure through a gravity flow system, Paper #994100. Presented at: 1999 ASAE Annual International Meeting, Toronto, Ontario, Canada, July 18-21, 1999. ASAE, St. Joseph, MI 49085.
- 58) **Stowell**, R., D. Elwell, B. Strobel, and H. Keener. 1999. Air flow and air quality within a High-Rise™ hog facility, Paper #994120. Presented at: 1999 Annual International ASAE Meeting, Toronto, Ontario, Canada, July 18-21, 1999. ASAE, St. Joseph, MI 49085.
- 59) **Stowell**, R. R., and A. McKenney. 1998. Solids content analysis of dairy farm flushwater in storage and at critical points of the waste stream, Paper #984120. Presented at: 1998 ASAE Annual International Meeting, Orlando, FL, July 12-15, 1998. ASAE, St. Joseph, MI 49085.
- 60) **Stowell**, R. R. 1998. Bedding with sand: Design of sand-bedded stalls. In: *Proceedings of the Ohio Dairy Conference*, p. 67-76. The Ohio State University, Columbus, OH 43210.
- 61) **Stowell**, R. R. 1998. Handling & storage options for sand-laden manure. Dairy Food and Industry Conference. Dept. of Food Science and Technology, Columbus, OH 43210.
- 62) Bender, R., R. R. **Stowell** and M. Veenhuizen. 1998. Natural ventilation alternative for two-story barns. Extension Education in Amish and Other Anabaptist Communities (conference). St. Joseph County, Michigan State University, Centreville, MI 49032.
- 63) **Stowell**, R. R. 1997. Recent developments and current issues in dairy facility design. In: *Proceedings of the Michigan Veterinary Conference*, p.562-565. Michigan Veterinary Medical Association, East Lansing, MI 48824.
- 64) **Stowell**, R. R. 1997. Utilizing health and performance records in the livestock facility decision-making process. In: *Proceedings of the Michigan Veterinary Conference*, p.566-569. Michigan Veterinary Medical Association, East Lansing, MI 48824.
- 65) Kacira, M., T. H. Short, and R. R. **Stowell**. 1997. A fluid dynamic evaluation of naturally ventilated gutter-connected greenhouses, Paper #974059. Presented at: 1997 ASAE Annual International Meeting, Minneapolis, MN, August 3-7, 1997. ASAE, St. Joseph, MI 49085.
- 66) **Stowell**, R. R. 1997. Evaluating dairy farms for expansion potential. Presented at: Dairy Expansion Conference: When Your Dairy Client Wants to Expand. The Ohio State University Extension & College of Veterinary Medicine, Columbus, OH 43210.

- 67) **Stowell, R. R.** 1996. Designing freestall facilities with the milking cow in mind. Dairy Food and Industry Conference. Dept. of Food Science and Technology, Columbus, OH 43210.
- 68) **Stowell, R. R., and W. G. Bickert.** 1996. Warm season heat transfer model for dairy cattle in naturally ventilated facilities, Paper #964061. Presented at: 1996 ASAE Annual International Meeting, Phoenix, AZ. ASAE, St. Joseph, MI 49085.

Invited presentations:

- 1) Collaboration and Engagement for Positive Impact on Rural Environments; PAFS Distinguished Lecture Series, ASABE; Online; July 14, 2021.
- 2) Scenario Planning; AgroClimate Outreach Exchange, Northern Plains Climate Hub; Fort Collins, CO; March 26, 2019.
- 3) Ammonia Emissions, CERCLA/EPCRA, and Related Air Quality Challenges; 2018 NCBA Convention, National Cattlemen's Beef Association; Phoenix, AZ; February 2, 2018.
- 4) Beef Climate Resiliency: Scenario Planning; NE Cattlemen's College; Kearney, NE; Dec. 6, 2016.
- 5) Pig Production Environmental Footprint Calculator: Footprints for Midwest Farms; Advisory board meeting for Swine Life-Cycle Assessment project; Fayetteville, AR; March 8, 2016.
- 6) Air Quality Education in Animal Agriculture Project & Air Quality/Emissions Tools; State/EPA Regions 6 and 7 Air Directors' Meeting and CenSARA Business Meeting; Lincoln, NE; December 9, 2015.
- 7) Livestock & Poultry Environmental Learning Center; Climate and Clean Air Coalition: Manure Management Meeting, Food and Agriculture Organization of the United Nations; Rome, Italy; January 24, 2014.
- 8) Animal Air Quality Regulations for Beef Feedlots; Iowa Feedlot Forum, Iowa State University; Sioux Center, IA; January 21, 2014.
- 9) Animal Agriculture & Climate Change: Developing National Extension Capacity to Address Issues Related to Animal Agriculture and Climate Change; Climate Change Project Directors' Meeting, NIFA; Gainesville, FL; January 8, 2014.
- 10) Agriculture in a Changing Climate project; Minnkota Builders and Suppliers Conference; March 8, 2013; Brookings, SD.
- 11) Best Management Practices for Reducing Odor & Emissions on Midwest Dairies; Wisconsin Dairy Manure Summit; Green Bay, WI; Feb 27, 2013.
- 12) Dairy Facility Siting and Technologies for Mitigating Emissions on Midwest Dairies; Wisconsin Dairy Manure Summit; Green Bay, WI; Feb 27, 2013.
- 13) National Facilitation of Extension Programming in Climate Change Mitigation and Adaptation for Animal Agriculture; Agricultural Decision Making with a Water and Climate Change Perspective Regional Conference; Nebraska City, NE; Nov. 3, 2011.
- 14) Manure Management Resources: Air Quality and Climate Change Issues; Farm Pilot Coordination Annual Technology Summit; Tampa, FL; Sept. 20, 2011.
- 15) Update on National Air Quality Extension Projects; 2011 Western Dairy Air Quality Symposium; Sacramento, CA; April 21, 2011.
- 16) Siting Animal Production Facilities and Evaluating Odor Control Options [Using the Odor Footprint Tool]; Livestock and Agriculture Processing Tour, Platte County Business Association; August 18, 2009.
- 17) Air Emissions Reporting from Animal Feeding Operations; Minnkota Builders' Conference; Brookings, SD; March 19, 2009.

- 18) Methane Recovery - Producer Considerations; Methane Recovery from Livestock Operations Workshop; York, NE; February 19, 2009.
- 19) Air quality concerns; Comprehensive Odor Footprint Tool: Odor Impact Assessment & Setback Estimation for Livestock Facilities; 2006 Nebraska Planning & Zoning Administrators Annual Conference; Kearney, NE; March 30, 2006.
- 20) Air Quality Technologies; Comprehensive Nutrient Management Plan Development; Kansas City, MO; February 15, 2006.
- 21) Odor Footprint Tool: Odor Impact Assessment & Setback Estimation for Livestock Facilities; 2006 County Board Officials Workshop; Kearney, NE; February 8, 2006.
- 22) Odor Footprint Tool: Odor Impact Assessment & Setback Estimation for Livestock Facilities; 2005 Nebraska Association of County Officials (NACO) Annual Conference; Omaha, NE; October 12, 2005.
- 23) Applications of the Odor Footprint Tool: Odor Impact Assessment & Setback Estimation for Livestock Facilities; 2005 NRCS Regional Conference; Gering, NE; March 15, 2005.
- 24) Creating Air Movement at Cow Level; 2003 Western Ohio Dairy Management Conference; Celina, OH; and 2003 Northeast Ohio Dairy Management Conference; Canton, OH; March 19 & 20, 2003.
- 25) Fan & Sprinkler Cooling: The Nuts and Bolts; 2003 Western Ohio Dairy Management Conference; and 2003 Northeast Ohio Dairy Management Conference; March 19 & 20, 2003.
- 26) Ventilation for Nursery Pigs; 43rd Annual George A. Young Swine Health and Management Conference; Nebraska Swine Veterinarians Association; Lincoln, NE; August 16, 2002.

Other Extension Publications:

- 1) Preventing heat stress in cattle feedlots and mitigating effects. BeefWatch article and podcast. Also KRVN radio spot.
- 2) Wilcox, B., J. Francis, R. **Stowell**... 2014. Nebraska's Potential for Energy Recovery from Animal Manure. <https://water.unl.edu/documents/NE%20Potential%20for%20Energy%20Recovery%20from%20Animal%20Manure.pdf>.
- 3) **Stowell**, R. R., A. Stokes, R. Ulrich, and C. Dunkley. 2012. Producer Association Efforts to Address Carbon Footprints: Pork and Poultry. eXtension webinar, <http://www.extension.org/pages/64440/producer-association-efforts-to-address-carbon-footprints:-porkand-poultry>.
- 4) Gross, J., C. Henry, and R. **Stowell**. 2012. Vegetative Treatment System (VTS) Operator's Manual. Nebraska Extension.
- 5) **Stowell**, R. 2011. Nebraska Odor Footprint Tool: Odor Impact Assessment & Setback Estimation for Livestock Facilities. Archived eXtension webinar, <http://www.extension.org/pages/55408/planning-livestock-poultry-facilities-for-reduced-odor-risk>.
- 6) **Stowell**, Rick. 2010. Producers finding foam-filled deep pits. Nebraska Pork Talk, Fall 2010 issue, p. 14. Nebraska Pork Producers Association, Lincoln, NE.
- 7) **Stowell**, Rick. 2010. New opportunities to learn about ventilation. Nebraska Pork Talk, Fall 2010 issue, p. 15. Nebraska Pork Producers Association, Lincoln, NE.
- 8) **Stowell**, R. R. 2005. Using your ventilation controller. Pork Bridge distance-learning session, on CD. Pork Central. University of Nebraska – Lincoln, Lincoln, NE
- 9) Brumm, M., S. Pohl, R. **Stowell**, and R. Thaler. 2003. Managing Your Unseen Employee: The Ventilation System. Workshop materials available to Extension educators as a 3-ring binder notebook or as CD. National Pork Board, Ames, IA.

- 10) **Stowell, R.** 2001. Pit additives. Manure Matters website, Vol. 7, No. 8 (<http://www.ianr.unl.edu/manure/>)
- 11) Elwell, D., H. Keener and R. **Stowell.** 1999. Less liquid, more options: The high route to managing hog manure. *Biocycle, Journal of Composting & Recycling*, October, p.36, 38.
- 12) **Stowell, Richard.** 1998. Tunnel ventilation - fad or fan? *Buckeye Dairy News* 1(9): 1-2, 4. The Ohio State University, Columbus, OH 43210.
- 13) Keener, H. M., D. L. Elwell and R. **Stowell.** 1998. Composting animal mortality. *ADDL News* 3(1): 4. Ohio Animal Disease and Diagnostic Laboratory, Reynoldsburg, OH.
- 14) Bickert, W. G., and R. R. **Stowell.** 1997. Plan Guide for Free Stall Systems, Second edition. Hoard's Dairyman, Fort Atkinson, WI 53538.
- 15) **Stowell, Richard.** 1997. Proper freestall design. *Buckeye Dairy News* 1(2): 5-6. The Ohio State University, Columbus, OH 43210.

Grant Activity

Internally Funded Research Grants Received: [One for \$19,500]

- 1) Erickson, G., D. Schulte and R. **Stowell**. Awarded in 2002. Science-Based Air Quality Data for the Beef Cattle Feedlot Industry and Rural Communities in Nebraska, ARD Interdisciplinary Grant, NEB-13-155; \$19,500/year for two years from USDA-CRIS.

Externally Funded Integrated Grants Received: [Seven for \$6,590,000 to UNL]

- 1) Kononoff, P., R. **Stowell**, T. Brown-Brandl, G. Erickson, M. Spangler, J. Sperber, and S. Fernando. 2024-2028. Understanding Host, Microbial, Environmental, and Management Factors towards Methane Mitigation in Ruminants. USDA NIFA AFRI; \$5,000,000 for 5 years; 25-6226-0731-001 (10%).
- 2) Fernando, S., S. Bartelt-Hunt, G. Morota, D. Loy, H. Paz Manzano, R. **Stowell**, T. Messer, D. Snow, and A. Schmidt. 2018-22. Ecology of Antimicrobial Resistance. USDA NIFA AFRI; \$773,607 for 4 years; 25-6226-0546-005 (8%).
- 3) Kononoff, P., and R. **Stowell**. 2018-19. Heat Production in Jersey Cows. American Jersey Cattle Research Foundation; \$8,500 for 1 year; 26-6226-0552-001 (49%).
- 4) Erickson, G., A. Schmidt, and R. **Stowell**. 2013-15. Integrated Anaerobic Digestion with Algae Bioenergy and Green Aquaculture. Nebraska Environmental Trust; \$250,000 for 2 years; 26-6226-0422-001 (10%).
- 5) **Stowell**, R., and D. Rudnick. 2015-16. Electrical Resistivity Tomography (ERT) Monitoring. Univ. of Arkansas Rice Research Center. U.S. Soybean Association subaward; \$9,935 for 1 yr; 26-6321-0310-001 (80%).
- 6) **Stowell**, R., D. Schulte, R. Koelsch, R. Sheffield, E. Wheeler, and K. Janni. 2007-10. Air Quality Extension and Education: Enhanced Learning Opportunities for Addressing Air Quality Issues in Animal Agriculture. USDA NRI Integrated programs; \$498,562 for 3 years; 25-6321-0134-001 (60%).
- 7) Erickson, G., R. **Stowell**, and B. Auvermann. Awarded in 2010. Greenhouse Gas Emissions and Nitrogen Cycling from Beef Production Systems: Effect of Climate, Season, Production System, Diet, and Management. USDA NIFA AFRI; \$49,960 for 12 months; 25-6226-0334-001 (50%).

Externally Funded Extension Grants Received: [Twenty-nine for \$6,275,000 to UNL]

- 1) **Stowell**, R., and A. Schmidt. 2023-24. Conducting Dairy Environmental Sustainability Focus Groups in Nebraska; Univ. of Minnesota, Midwest Dairy subaward; \$12,000 for 1 year; TBD (50%)
- 2) Reiling, B., D. Ciobanu, N. Conner, A. Cupp, T. Ruth, R. **Stowell**, and G. Sullivan. 2021-24. Enhancement of Agricultural Literacy through Inquiry-Based Professional Development. USDA NIFA; \$291,000 for 3 years; 25-6326-0643-001 (1%).
- 3) **Stowell**, R. 2019-24. Comprehensive Nutrient Management Plan (CNMP) Online Training Development. USDA NRCS; \$96,000 for 4 years; 25-6321-0420-001 (100%).
- 4) **Stowell**, R., and A. Schmidt. 2018-24. Water and Nutrient Recycling: A Decision Tool and Synergistic Innovative Technology, Univ. of Arkansas, USDA AFRI subaward; \$496,650 for 5 years; 26-6321-0391-001 (60%).

- 5) **Stowell**, R., A. Schmidt, and J. Heemstra. 2018-22. Communicating about Antimicrobial Research, Univ. of Maryland, USDA AFRI subaward; \$60,000 for 4 years; 26-6321-0378-001 (50%).
- 6) **Stowell**, R., and A. Schmidt. 2018-19. Environmental Footprints for Swine, Univ. of Minnesota, National Pork Board subaward; \$13,641 for 1 year; 26-6321-0383-001 (60%).
- 7) **Stowell**, R., C. Powers, D. Redfearn, S. Hu, T. Walz, M. Luebbe, G. Erickson, T. Williams, and E. Cortus. 2016-17. Scenario Planning for Resilient Beef Systems. USDA Northern Plains Regional Climate Hub; \$15,000 for 1 yr; 26-6121-0337-001 (20%).
- 8) Heemstra, J., and **Stowell**, R. 2013-17. Vermont Software. Univ. of Vermont, subaward; \$12,959 for 3 years; 26-6341-0183-001 (50%).
- 9) Heemstra, J., and R. **Stowell**. 2013-14. Manure to Energy. Univ. of Maryland. USDA NRCS CIG subaward; \$8,577 for 2 years; 26-6341-0171-001 (50%).
- 10) **Stowell**, R., and J. Heemstra. 2012-13. Mitigation, Monitoring and Microbial Assessment of Gas-Phase Biofilters and Extension Outreach. University of Minnesota. USDA AFRI subaward; \$24,653 for 15 months; 26-6321-0235-001 (70%).
- 11) **Stowell**, R., J. Heemstra, J. Harrison, S. Mukhtar, M. Risse, C. Gooch, and L. Jacobson. 2011-16. National Facilitation of Extension Programming in Climate Change Mitigation and Adaptation for Animal Agriculture. USDA NIFA AFRI; \$4,290,618 for 5 years; 25-6321-0212-001 (27.3%).
- 12) **Stowell**, R., and J. Heemstra. 2011-16. Integrated Resource Management Tool to Mitigate the Carbon Footprint of Swine Produced in the U.S. University of Arkansas; USDA AFRI subaward; \$155,148 for 5 years; 26-6321-0221-001 (50%).
- 13) Henry, C., J. Gross, R. **Stowell**, and C. Powers. 2011-14. Small AFO Demonstration & Education. Nebraska Dept. of Environmental Quality; \$264,577 for 4 years; 26-6321-0215-001 (45%).
- 14) **Stowell**, R., and C. Powers. 2010-11. NAQSAT Education. Michigan State University, NRCS CIG subaward; \$5,762 for 1 year; 26-6321-0205-001 (50%).
- 15) **Stowell**, R., and J. Heemstra. 2010. Air Emissions from Deep-Bedded Mono-Slope Beef Barns. South Dakota State Univ., USDA AFRI subaward; \$26,340 for 3 years; 26-6321-0186-001 (50%).
- 16) **Stowell**, R., and J. Heemstra. 2009-12. Air Quality: Odor, Dust and Gaseous Emissions from Concentrated Animal Feeding Operations (CAFOs) in the Southern Great Plains. Texas A&M University, USDA NIFA subawards; \$20,400 for 3 years; 25-6321-0113-006, 26-6321-0181-001, 26-6321-0190-001 and 26-6321-0203-001 (34%).
- 17) **Stowell**, R., and D. Schulte. 2008-10. Effects of Manure Handling and Application Method on Odor and Gas Emission Potential of Swine Manure. Nebraska Pork Producers Association; \$15,000 for 15 months; 26-6321-0165-001 (50%).
- 18) **Stowell**, R., and D. Schulte. 2008-10. Economic Cost - Environmental Benefit Evaluation of Shelterbelts and Other Odor Control Alternatives for Livestock Operations. Nebraska Corn Board; \$23,850 for 15 months; 26-6221-0171-001 (100%).
- 19) Jacobson, L. lead PI, **Stowell** key collaborator. 2008-10. Reducing the Environmental Footprint of Swine Buildings. Minnesota Pork Board; \$60,000 for 3 years (0%).
- 20) Powers, W. lead PI, **Stowell** key collaborator. 2007-11. Development of a National Air Quality Self-Assessment Tool (NAQSAT) for Livestock Producers. USDA NRCS CIG; \$443,410 for 4 years (0%).
- 21) Henry, C., J. Gross, and R. **Stowell**. 2006-13. Livestock Producer Environmental Assistance Program. Nebraska Environmental Trust; \$600,000 for 6 years; 26-6321-0116-001 (33%).

- 22) **Stowell**, R. R., C. Henry, D. Schulte, and R. Koelsch. 2006-9. Odor Footprint Tool Demonstration: Assisting Rural Communities in Maintaining Air Quality. Nebraska Environmental Trust Fund; \$158,700 for 3 years; 26-6321-0120-001 (80%).
- 23) **Stowell**, R. R., C. Henry, D. Schulte, R. Koelsch, and D. Billesbach. 2006-8. Facilitating the Use of the Odor Footprint Tool by Nebraska Pork Producers. National Pork Board, Project #06-141, as approved by the Nebraska Pork Producers Association; \$32,000 for 18 months; 26-6321-0125-001 (75%).
- 24) **Stowell**, R. R., C. Henry, D. Schulte, R. Koelsch, and L. Koppolu. 2004-6. Laying the Groundwork for Odor Control and Setback Estimation in Nebraska; National Pork Board, Project #04-180, as approved by the Nebraska Pork Producers Association; \$30,600 for 2 years; 26-6321-0095-001 (70%).
- 25) **Stowell**, R. R., and R. Koelsch. 2004. Limiting Risk for Odor Complaints through Site Evaluation and Use of other Appropriate Technologies. National Pork Board Educational Grant; \$2,500 for 6 months; 26-6321-0091-001 (90%).
- 26) **Stowell**, R., and M. Brumm. 2002-3. Zone Heating for Wean-to-Finish Facilities: A Performance Comparison. National Pork Board, Project #02-194, as approved by the Nebraska Pork Producers Association; \$6,525 for 15 months; 26-6221-0062-001 (90%).
- 27) **Stowell**, R. R., S. Niemeyer, and D. Hay. 2001-2. Preparing Extension Educators in Disaster Mitigation, Preparedness and Recovery, Michigan State University, USDA-CSREES Special Needs Grant #2002-03943 subaward; \$6,800 for 15 months; 26-6321-0065-001 (70%).

Previous, non-UNL grants:

- 28) **Stowell**, R. R., N. St. Pierre, and C. Gooch. 2000-2. Tunnel Ventilation for Freestall Facilities: Comparative Performance Study. Ohio Dairy Research Fund; \$7,500 for 18 months.
- 29) M. Keener, D. Elwell, R. **Stowell**, T. Menke, and M. Veenhuizen. 1998-2001. Integrated Swine Production and Manure Drying System. Ohio Agricultural Research and Development Center; \$150,066 for 3 years.

Internally Funded Extension Grants Received: [Two for \$11,450]

- 1) Luebbe, M., Erickson, G., Koelsch, R., Parsons, J., Plugge, B., and **Stowell**, R. 2016-17. IANR Faculty Engagement with US Roundtable for Beef Sustainability. IC-2210 grant; \$1,450 for 2 years.
- 2) **Stowell**, R. R., and F. Munoz-Arriola. 2015. Enhance Decision-Making: Generating Nebraska Climate Information. Nebraska Extension subaward from USDA ARS grant; \$10,000 for 1 year; 25-6309-0054-003 (50%).

Externally Funded Teaching Grants Received: [One for \$79,500 to UNL]

- 1) **Stowell**, R. 2014-17. Create eLearning in NIFA Challenge Areas to Transform Education of Controlled Environment Animal Production (eCEAP) for Sustainability. USDA Higher Education Challenge grant subaward; \$79,540 for 3 years; 26-6121-0265-001 (100% of subaward).

Graduate Research and Student Advising

Advised MS Students:

- 1) Juan Carlos Sanchez Ramos (co-advisor), M.S. Mechanized Systems Management; Thesis title: *Assessment of Manure Treatment Technology Adoption and Feedlot Runoff Monitoring Opportunities*; graduated UNL May 2022.
- 2) Kara Niemeir, M.S. Environmental Engineering; Thesis title: *Validating the Odor Footprint Tool for Assessing the Odor Impact of Livestock Buildings in a Rural Great Plains Setting*; Awarded the 2006-2007 Widaman Trust Distinguished Graduate Assistant Award; graduated UNL August 2007.
- 3) Jason Byler (co-advisor), M.S. Biological Systems Engineering; Thesis title: *Odor, H₂S and NH₃ Emissions from Phototrophic and Non-Phototrophic Anaerobic Swine Lagoons*; graduated UNL May 2004.
- 4) Ryan Duyson (co-advisor), M.S. Biological Systems Engineering; Thesis title: *Ammonia, Hydrogen Sulfide and Odor Emissions from a Beef Cattle Feedlot*; graduated UNL December 2003.
- 5) Kenneth Wolfe, M.S. Agricultural Engineering; Thesis title: *Evaluation of Hopper Configurations and Non-Newtonian Fluid Flow through a Dairy Manure Gravity Flow Model*; graduated [The Ohio State Univ.] May 1998.

Graduate Research Committees:

Chad Jenkins, Ph.D. Animal Science; Dissertation title: *The Role of Dietary Choline in Dairy Cattle Nutrition and One-Carbon Metabolism*; graduated UNL August 2022.

Jessica Sperber, Ph.D. Animal Science; Dissertation title: *Impact of Wood-Sourced Biochar on Carbon and Nitrogen Capture in Beef Feedlot Systems*; graduated UNL December 2021.

Allison Knoell, Ph.D. Animal Science; Dissertation title: *Understanding Rumen Microbial Community Structure and Function towards Decreasing Methane Emissions and Increasing Feed Efficiency*; graduated UNL May 2021.

Thomas Winders, M.S. Animal Science; Thesis title: *Beef Methane Emissions*; graduated UNL May 2018.

Calvin Harman, M.S. Agricultural & Biological Systems Engineering; Thesis title: *Livestock Thermodynamics and Crop Yield Gaps in Sub-Saharan Africa*; graduated UNL December 2017.

Jared Judy, Ph.D. Animal Science; Dissertation title: *Energy Balance of Dairy Cattle*; graduated UNL December 2017.

Bradley Boyd, M.S. Animal Science; Thesis title: *Performance, Body Temperature, and Blood Metabolites of Feedlot Steers as Influenced by Environmental Conditions and Supplementation of Zilpaterol Hydrochloride*; graduated UNL December 2015.

Christopher Henry, Ph.D. Agricultural & Biological Systems Engineering; Dissertation title: *Development of the Mask Scentometer, a Comparison of Ambient Odor Assessment Methods, and Their Application in Ground-Truthing Atmospheric Dispersion Models*; graduated UNL December 2009.

Rodrigo Arias, Ph.D. Animal Science; Dissertation title: *Modeling the Effects of Environmental Factors on Finished Cattle*; graduated UNL December 2008.

Naeem Ebrahim, M.S. Environmental Engineering; Thesis title: *Process-Based Modeling of Odor Dispersion from Area-Source Livestock Facilities*; graduated UNL May 2007.

Stephanie Quinn, M.S. Animal Science; Thesis title: *Effect of Phase Feeding to Encourage Nitrogen Recycling on Nitrogen Mass Balance and Cattle Performance*; graduated UNL August 2006.

Melissa Halverson, M.S. Agricultural & Biological Systems Engineering; Thesis title: *A Knowledge-Based Model to Assess Odor Annoyance*; graduated UNL May 2006.

In-Bok Lee, M.S. Agricultural Engineering; Thesis title: *Fluid Dynamic Simulation and Validation of a Naturally Ventilated Multi-Span Greenhouse*; graduated OSU 1998.

Vern Woodruff III, M.S. Agricultural Engineering; Thesis title: *Analysis of Vent Designs for Naturally Ventilated Gutter-Connected Greenhouses Using FLUENT*; graduated OSU 1997.

Douglas Carey, M.S. Agricultural Engineering; Thesis title: *Minimizing Nitrogen Loss from Poultry Manure Compost Amended with Ammonium Sulfate*; graduated OSU 1997.

Murat Kacira, M.S. Agricultural Engineering; Thesis title: *Modeling Dynamic Air Exchanges for Naturally Ventilated Sawtooth Greenhouse Designs*; graduated OSU 1996.

Presentations:

Stowell, R.R., D.Keshwani, and D. Heeren. Strengthening Student Skills in Evaluating Technical and Economic Aspects of Ag Technology Systems through Capstone Projects. Presented at: ASABE 2024 Annual International Meeting, Anaheim, California.