

An Integrated Approach to Improve Whole Herd Pig Livability Through Research and Industry Collaboration

Introduction and Project Objectives

The Improving Pig Survivability project is an on-going project encompassing research, education, and extension efforts with the goal of reducing overall mortality in the U.S. commercial swine industry. The project is funded by the National Pork Board and the Foundation for Food and Agriculture Research (FFAR). Team members have been represented by multiple institutions including Iowa State University, Kansas State University, and Purdue University. The project is guided by an advisory board consisting of representation across a wide spectrum of the US swine industry and multiple research projects have been direct collaborations with producers and allied industry partners in a field setting. Research efforts in this project seek to identify factors contributing to swine mortality in commercial production, and to develop strategies and information that can be utilized to reduce mortality and maximize pig survivability.

The initial project (2019-2024) had 4 objectives encompassing economics, the sow, preweaning livability, wean to finish livability, and a robust extension effort. The current project (2024-2026) has 4 primary pillar objectives:

- **Pillar 1:** Reduce mortality causes on U.S. sow farms by developing and implementing targeted strategies to maximize livability.
- **Pillar 2:** Improve pre-weaning livability of piglets through pre-farrow and post-farrowing strategies.
- **Pillar 3:** Enhance wean-to-finish livability via targeted management, nutrition, and labor efficiency strategies.
- **Pillar 4:** Expand the nationally recognized extension and outreach program to disseminate research findings and engage stakeholders.

Project Outcomes

Through the collaborations of the Pig Survivability project, a large number of resources have been generated and made available to different audiences including peer-reviewed publications, factsheets, short informational videos, and podcasts. Dissemination of information learned through this project through extension and training efforts are critical to maximize the impact of the research efforts.

Through the Pig Survivability project, there have been a total of:

- 18 undergraduate internships
- 27 graduate students trained
- 50+ undergraduates trained
- 37 peer-reviewed publications
- 37 abstracts/presentations at meetings
- 12 poster presentations
- 5 published proceedings
- 123 invited presentations
- 35 popular press and animal industry reports
- 32 factsheets covering wide array of topics (23 available in Spanish)
- 30 short informational videos (13 available in Spanish)

- 66 podcasts (PigX podcast)
- 2 economic decision tools (economic modeling of breed-to-wean and wean-finish mortality)
- 1 International conference

The International Conference on Pig Survivability was held October 27 and 28, 2021 in Omaha, Nebraska, at the Hilton Omaha. The conference's objective was to facilitate the discussion and dissemination of the most current information relative to sow, litter, weaned pig and grow-finish mortality. A total of 451 participants from 29 states, 5 countries representing 175 different swine operations and allied industry business attended.

As a key outcome of the project, nearly all resources are available at the Improving Pig Survivability website (www.piglivability.org).

Training Activities:

The project supported the training activities of many students and staff:

- Graduate Students
 - Objective 1
 - Blaire Todd-Master's student working with Dr. Nick Gabler
 - Kayla Miller-PhD student working with Dr. Nick Gabler
 - Erin Dolecheck -PhD student working with Dr. Lee Schulz
 - Objective 2 (sow)
 - Grace Moeller – Master's student working with Dr. Ken Stalder
 - Zoe Kiefer – Master's student working with Dr. Jason Ross
 - Jamie Studer – PhD student working with Dr. Jason Ross
 - Dr. Justin Brown – Post-doctoral veterinarian working with Dr. Chris Rademacher and Locke Karriker
 - Dr. Meredith Petersen – Post-doctoral veterinarian working with Dr. Chris Rademacher and Locke Karriker
 - Dr. Gabi Doughan – Post-doctoral veterinarian working with Dr. Chris Rademacher and Locke Karriker
 - Vishesh Bhatia – PhD student working with Dr. Jack Dekkers
 - Usamah Kabuye – PhD student working with Dr. Jack Dekkers
 - Tricia Veldhuizen – Master's student working with Dr. Jack Dekkers
 - Laura Solis-Avila – Master's student working with Dr. Marcelo Almeida
 - Objective 2 (pre-weaning)
 - Larissa Shirley-Master's student working with Dr. Kara Stewart
 - Marcie Christianson-Master's student with Dr. Ken Stalder
 - Kiah Gourley-PhD student with Dr. Jason Woodworth
 - Julia Holen-PhD student working with Dr. Jason Woodworth
 - Emiline Sundman-Master's student working with Dr. Anna Johnson
 - Spenser Becker-PhD student working with Dr. Laura Greiner
 - Abigail Jenkins- PhD student working with Dr. Jason Woodworth and Dr. Mike Tokach

- Mikayla Spinler- PhD student working with Dr. Jason Woodworth and Dr. Bob Goodband
 - Samantha Swanson- Master's student working with Dr. Bob Goodband
 - Sierra Collier- Master's student working with Dr. Bob Goodband
- Objective 3
 - Jordan Gebhardt-PhD student with Dr. Mike Tokach
 - Madie Wensley-PhD student with Dr. Mike Tokach
 - Edison Magalhaes-Master's student with Dr. Daniel Linhares
 - Dr. Megan Nickel – Post-doctoral veterinarian working with Dr. Chris Rademacher and Dr. Locke Karriker
- Summer Interns
 - Erika Johnson - The first undergraduate intern supported on this project worked throughout summer 2019. She focused on POP projects, but she was also able to help with the Sow Transition project, Sow Induction project, and Extension activities.
 - Caitlyn Eickleberry – In summer of 2020, Caitlyn Eickleberry worked with Dr. Jason Woodworth at Kansas State University where she helped with various research and extension activities.
 - Mikayla Spinler - In summer of 2020, Mikayla Spinler worked with Dr. Nick Gabler at Iowa State University where she helped with various research and extension activities.
 - Alicia Denton – Alicia Denton worked with Dr. Kara Stewart at Purdue summer of 2021 and conducted a third trial looking at the impacts of heat lamp placement and piglet management at the time of birth on piglet growth and survival to weaning. They supervised undergraduate workers, collected data, conducted assays, entered data and interpreted data. They also contributed significantly to additional trials being conducted in the research laboratory.
 - Alton Holstine – Alton Holstine worked with Dr. Kara Stewart at Purdue summer of 2021 and conducted a third trial looking at the impacts of heat lamp placement and piglet management at the time of birth on piglet growth and survival to weaning. They supervised undergraduate workers, collected data, conducted assays, entered data and interpreted data. They also contributed significantly to additional trails being conducted in the research laboratory.
 - Ty Kim – Ty Kim worked with Dr. Mike Tokach at Kansas State University summer of 2021 where he helped with several field research projects managed by Madie Wensley.
 - Andrew Boschert – Andrew Boschert worked with Dr. Mike Tokach at Kansas State University summer of 2021 where he helped with several field research projects managed by Madie Wensley.
 - Grace deNeui – Grace deNeui worked with Dr. Nick Gabler at Iowa State University and Dr. Kara Stewart at Purdue University where she helped with multiple research projects and extension activities.
 - Abigail Statler – Abigail Statler worked with Dr. Nick Gabler at Iowa State University and Dr. Kara Stewart at Purdue University where she helped with multiple research projects and extension activities.
 - Maeghan Petznick- Maeghan Petznick worked with Dr. Laura Greiner at Iowa State University where she helped with multiple research projects

- and extension activities managed by Stacie Matchan.
- Ayva Bohr- Ayva Bohr worked with Dr. Laura Greiner at Iowa State University where she helped with multiple research projects and extension activities managed by Stacie Matchan.
- Emma Coursey- Emma Coursey worked with Dr. David Rosero at Iowa State University where she helped with multiple research projects and extension activities managed by Stacie Matchan.
- Alexa Huber- Alexa Huber worked with Dr. David Rosero at Iowa State University where she helped with multiple research projects and extension activities managed by Stacie Matchan.
- Sierra Collier- Sierra Collier worked with JBS Live Pork on pigs placed on available teats.
- Samantha Swanson- Samantha Swanson worked with Pillen Family Farms on split suckling.
- Abigail Dies- Abigail Dies worked with multiple Iowa State University researchers, assisting with several research projects and extension activities managed by Stacie Matchan.
- Peyton Hereth- Peyton Hereth worked with multiple Iowa State University researchers, assisting with several research projects and extension activities managed by Stacie Matchan.
- Wyatt Dooley- Wyatt Dooley worked with Dr. Katelyn Gaffield at Kansas State University summer of 2021 where he helped with multiple research projects and extension activities.
- Many additional graduate or undergraduate students are assisting at research and commercial farms with data collection. The commercial trials give students a unique exposure to a commercial sow farm that many students do not otherwise get.
- Train the Trainer
 - SOP review and training of all Standard Nutrition sow farm managers by Kara Stewart. February 23, 2022.

Scholarly Outputs in Research and Extension

Peer Reviewed Manuscripts

1. Gebhardt, J. T., Tokach, M. D., Dritz, S. S., DeRouchey, J. M., Woodworth, J. C., Goodband, R. D., & Henry, S. C. (2020). Postweaning mortality in commercial swine production. I: review of non-infectious contributing factors. *Translational Animal Science*, 4(2), 462–484. <https://doi.org/10.1093/tas/txaa068>.
2. Gebhardt, J. T., Tokach, M. D., Dritz, S. S., DeRouchey, J. M., Woodworth, J. C., Goodband, R. D., & Henry, S. C. (2020). Postweaning mortality in commercial swine production II: review of infectious contributing factors. *Translational Animal Science*, 4(2), 485–506. <https://doi.org/10.1093/tas/txaa052>.
3. Gourley, K. M., Swanson, A. J., Royall, R. Q., DeRouchey, J. M., Tokach, M. D., Dritz, S. S., Goodband, R. D., Hastad, C. W., & Woodworth, J. C. (2020). Effects of timing and size of meals prior to farrowing on sow and litter performance. *Translational Animal Science*, 4(2), 724–736. <https://doi.org/10.1093/tas/txaa066>.
4. Kiefer, Z. E., Koester, L. R., Showman, L., Studer, J. M., Chipman, A. L., Keating, A. F., Schmitz-Esser, S., & Ross, J. W. (2021). Vaginal microbiome and serum metabolite differences in late gestation commercial sows at risk for pelvic organ prolapse. *Scientific Reports*, 11(1), 6189. <https://doi.org/10.1038/s41598-021-85367-3>.

5. Kiefer, Z. E., Studer, J. M., Chipman, A. L., Adur, M. K., Mainquist-Whigham, C., Gabler, N. K., Keating, A. F., & Ross, J. W. (2021). Circulating biomarkers associated with pelvic organ prolapse risk in late gestation sows. *Journal of Animal Science*, 99(8). <https://doi.org/10.1093/jas/skab207>.
6. Kiefer, Z. E., Koester, L. R., Studer, J. M., Chipman, A. L., Mainquist-Whigham, C., Keating, A. F., Schmitz-Esser, S., & Ross, J. W. (2021). Vaginal microbiota differences associated with pelvic organ prolapse risk during late gestation in commercial sows. *Biology of Reproduction*, 105(6), 1545–1561. <https://doi.org/10.1093/biolre/ioab178>.
7. Wensley, M. R., Tokach, M. D., Woodworth, J. C., Goodband, R. D., Gebhardt, J. T., DeRouchey, J. M., & McKilligan, D. (2021). Maintaining continuity of nutrient intake after weaning. I. Review of pre-weaning strategies. *Translational Animal Science*, 5(1). <https://doi.org/10.1093/tas/txab021>
8. Wensley, M. R., Tokach, M. D., Woodworth, J. C., Goodband, R. D., Gebhardt, J. T., DeRouchey, J. M., & McKilligan, D. (2021). Maintaining continuity of nutrient intake after weaning. II. Review of post-weaning strategies. *Translational Animal Science*, 5(1). <https://doi.org/10.1093/tas/txab022>
9. Holen, J. P., Woodworth, J. C., Tokach, M. D., Goodband, R. D., DeRouchey, J. M., & Gebhardt, J. T. (2021). Evaluation of Supplemental Fat Sources and Pre-Farrow Essential Fatty Acid Intake on Lactating Sow Performance and Essential Fatty Acid Composition of Colostrum, Milk, and Adipose Tissue. *Kansas Agricultural Experiment Station Research Reports*, 7(11). <https://doi.org/10.4148/2378-5977.8170>.
10. Wensley, M. R., Tokach, M. D., Goodband, R. D., Gebhardt, J. T., Woodworth, J. C., DeRouchey, J. M., Allerson, M., Menegat, M., & Boeschert, A. (2021). Effect of Floor Feeding Creep Feed on the Growth Performance and Mortality of Pigs After Weaning. *Kansas Agricultural Experiment Station Research Reports*, 7(11). <https://doi.org/10.4148/2378-5977.8166>.
11. Wensley, M. R., Kim, T., Tokach, M. D., Goodband, R. D., Woodworth, J. C., DeRouchey, J. M., McKilligan, D., Upah, N., & Gebhardt, J. T. (2021). Effects of Providing a Liquid Sensory Attractant to Suckling Pigs in Lactation and After Weaning on Post-Weaning Pig Performance. *Kansas Agricultural Experiment Station Research Reports*, 7(11). <https://doi.org/10.4148/2378-5977.8167>.
12. Wensley, M. R., Tokach, M. D., Goodband, R. D., Gebhardt, J. T., Woodworth, J. C., DeRouchey, J. M., McKilligan, D., & Upah, N. (2021). Effects of Providing Enrichment Cubes to Suckling Pigs in Late Lactation and After Weaning on Post-Weaning Pig Performance. *Kansas Agricultural Experiment Station Research Reports*, 7(11). <https://doi.org/10.4148/2378-5977.8168>.
13. Wensley, M. R., Tokach, M. D., Goodband, R. D., Gebhardt, J. T., Woodworth, J. C., DeRouchey, J. M., McKilligan, D., & Upah, N. (2021). Effects of Providing a Sensory Attractant Powder to Suckling Pigs in Late Lactation and After Weaning on Post-Weaning Pig Performance. *Kansas Agricultural Experiment Station Research Reports*, 7(11). <https://doi.org/10.4148/2378-5977.8169>.
14. Wensley, M. R., Tokach, M. D., Goodband, R. D., Gebhardt, J. T., Woodworth, J. C., DeRouchey, J. M., Allerson, M., & Menegat, M. (2021). Effects of Mat Feeding on the Growth Performance and Mortality of Pigs After Weaning. *Kansas Agricultural Experiment Station Research Reports*, 7(11). <https://doi.org/10.4148/2378-5977.8179>.
15. Magalhães, E. S., Zimmerman, J. J., Thomas, P., Moura, C. A. A., Trevisan, G., Holtkamp, D. J., Wang, C., Rademacher, C., Silva, G. S., & Linhares, D. C. L. (2022). Whole-herd risk factors associated with wean-to-finish mortality under the conditions of a Midwestern

- USA swine production system. *Preventive Veterinary Medicine*, 198, 105545. <https://doi.org/10.1016/j.prevetmed.2021.105545>.
16. Sundman, E. R., Gabler, N. K., Millman, S. T., Stalder, K. J., Karriker, L. A., & Johnson, A. K. (2022). The Use of Attractants to Stimulate Neonatal Piglet Interest in Rope Enrichment. *Animals*, 12(2), 211. <https://doi.org/10.3390/ani12020211>.
 17. Holen, J. P., Woodworth, J. C., Tokach, M. D., Goodband, R. D., DeRouchey, J. M., Gebhardt, J. T., DeDecker, A. E., & Martinez, X. (2022). Evaluation of essential fatty acids in lactating sow diets on sow reproductive performance, colostrum and milk composition, and piglet survivability. *Journal of Animal Science*, 100(6). <https://doi.org/10.1093/jas/skac167>.
 18. Wensley, M. R., Potter, M. L., Tokach, M. D., Woodworth, J. C., Goodband, R. D., DeRouchey, J. M., Gebhardt, J. T., Menegat, M. B., & Allerson, M. W. (2022). Effects of mat feeding on the growth performance, removal, and mortality of pigs after weaning. *Journal of Animal Science*, 100(12). <https://doi.org/10.1093/jas/skac344>.
 19. Bhatia, V., Schmied, J., Cheng, J., Bai, X., Mallard, B., Fortin, F., Harding, J. C. S., Dyck, M. K., Plastow, G. S., Field, C. J., Rogel-Gaillard, C., Blanc, F., Canada, P., & Dekkers, J. C. M. (2022). 797. Genetic relationships among immune response traits of young healthy pigs evaluated by immunoassays. *Proceedings of 12th World Congress on Genetics Applied to Livestock Production (WCGALP)*, 3282–3285. https://doi.org/10.3920/978-90-8686-940-4_797.
 20. Holen, J. P., Woodworth, J. C., Tokach, M. D., Goodband, R. D., DeRouchey, J. M., & Gebhardt, J. T. (2023). Evaluation of supplemental fat sources and pre-farrow essential fatty acid intake on lactating sow performance and essential fatty acid composition of colostrum, milk, and adipose tissue. *Journal of Animal Science*, 101. <https://doi.org/10.1093/jas/skac394>.
 21. Bhatia, V., Stevens, T., Derks, M. F. L., Dunkelberger, J., Knol, E. F., Ross, J. W., & Dekkers, J. C. M. (2023). Identification of the genetic basis of sow pelvic organ prolapse. *Frontiers in Genetics*, 14. <https://doi.org/10.3389/fgene.2023.1154713>.
 22. Wensley, M. R., Woodworth, J. C., Tokach, M. D., Goodband, R. D., DeRouchey, J. M., & Gebhardt, J. T. (2023). Effect of early vs. late maturing sire lines and creep feeding on the cortisol response, intestinal permeability, and growth performance of nursery and finishing pigs. *Journal of Animal Science*, 101. <https://doi.org/10.1093/jas/skac169>.
 23. Wensley, M. R., Boschert, A. W., Kim, T. H., Tokach, M. D., Woodworth, J. C., Goodband, R. D., DeRouchey, J. M., Gebhardt, J. T., & Stephenson, E. W. (2023). Effects of gruel feeding and oral dextrose on the survivability of pigs after weaning. *Translational Animal Science*, 7(1). <https://doi.org/10.1093/tas/txad082>.
 24. Becker, S. L., Humphrey, D. C., Karriker, L. A., Brown, J. T., Skoland, K. J., & Greiner, L. L. (2023). The effects of dietary essential fatty acid ratios and linoleic acid level in grow–finish pigs. *Journal of Animal Science*, 101. <https://doi.org/10.1093/jas/skad263>.
 25. Becker, S. L., & Greiner, L. L. (2023). The impact of essential fatty acid ratios and unsaturated to saturated fat ratio on growth performance of grow–finish pigs and estrus detection of gilts. *Translational Animal Science*, 7(1). <https://doi.org/10.1093/tas/txad088>.
 26. Becker, S. L., Humphrey, D. C., Karriker, L. A., Brown, J. T., Skoland, K. J., & Greiner, L. L. (2023). The effects of dietary essential fatty acid ratios and energy level on growth performance, lipid metabolism, and inflammation in grow–finish pigs. *Journal of Animal Science*, 101. <https://doi.org/10.1093/jas/skad151>.
 27. Bhatia, V., Stevens, T., Derks, M. F. L., Dunkelberger, J., Knol, E. F., Ross, J. W., & Dekkers, J. C. M. (2023). Identification of the genetic basis of sow pelvic organ prolapse. *Frontiers in Genetics*, 14. <https://doi.org/10.3389/fgene.2023.1154713>.

28. Wensley, M., Tokach, M., Woodworth, J., Goodband, R., DeRouchey, J., & Gebhardt, J. (2023). Feeding strategies to increase sow colostrum quality and yield. *Journal of Swine Health and Production*, 31(3), 133–136. <https://doi.org/10.54846/jshap/1322>.
29. Wensley, M., Tokach, M., Woodworth, J., Goodband, R., DeRouchey, J., & Gebhardt, J. (2023). Strategies to minimize fallback pigs in the nursery. *Journal of Swine Health and Production*, 31(5), 237–241. <https://doi.org/10.54846/jshap/1319>.
30. Wensley, M. R., Tokach, M. D., Woodworth, J. C., Goodband, R. D., DeRouchey, J. M., Gebhardt, J. T., McKilligan, D., & Upah, N. (2023). Effects of providing sensory attractants to suckling pigs during lactation and after weaning on post-weaning growth performance. *Translational Animal Science*, 7(1). <https://doi.org/10.1093/tas/txac170>.
31. Wensley, M., Tokach, M., Woodworth, J., Goodband, R., DeRouchey, J., & Gebhardt, J. (2023). Nutritional strategies to reduce the impact of *Escherichia coli* in newly weaned pigs. *Journal of Swine Health and Production*, 31(5), 230–235. <https://doi.org/10.54846/jshap/1318>.
32. Fortney, D.L. Biologically environment enrichment to improve nursery pig survivability. 2024. MS thesis.
33. Fortney, D.L., Sundman, E.R., S. T. Millman, S.T., Johnson, A.K. 2024. Latency to feeder as a predictor of survivability in the weaning pig. To be submitted to *Applied Animal Behavior*.
34. Fortney, D.L., Sundman, E.R., S. T. Millman, S.T., Johnson, A.K. 2024. Nutritional enrichment to improve the weaning transition in nursery aged swine. To be submitted the *Journal of Animal Behavior*.
35. Fortney, D.L., Sundman, E.R., Buckova, K., S. T. Millman, S.T., Johnson, A.K. 2024. Review of current environmental enrichment in the swine industry and what is biologically relevant? To be submitted to the *Journal of Swine Health and Production*.
36. Kiefer, Z. E., Koester, L. R., Studer, J. M., Schmitz-Esser, S., & Ross, J. W. (2024). Evaluation of fecal microbiota of late gestation sows in relation to pelvic organ prolapse risk. *Frontiers in Microbiology*, 15. <https://doi.org/10.3389/fmicb.2024.1384583>
37. Studer, J. M., Kiefer, Z. E., Koester, L. R., Johnson, E. M., Schmitz-Esser, S., Farkas, A., Galina Pantoja, L., Vonnahme, K. A., Greiner, L. L., Keating, A. F., Baumgard, L. H., & Ross, J. W. (2024). Evaluation of circulating immune cells, analytes, and inflammatory markers in sows affected with postpartum dysgalactia syndrome. *Journal of Animal Science*. <https://doi.org/10.1093/jas/skae270>

Abstracts Presented at Scientific Meetings

1. Tokach, M., Gebhardt, J., Dritz, S., Woodworth, J., DeRouchey, J., Goodband, R. Opportunities to enhance wean-to-finish pig survival. *Journal of Animal Science*, Volume 98, Issue Supplement_4, Nov 2020, Page 184, <https://doi.org/10.1093/jas/skaa278.339>.
2. Christianson, M.I., Stalder, K.J., Ramirez, A., Beitz, D.C., and Keating, A. Effect of genetic line and parity of dam on litter birth weight and weaning weight in swine. *Journal of Animal Science*, Volume 98, Issue Supplement_3, Nov 2020, Pages 47-48, <https://doi.org/10.1093/jas/skaa054.086>.
3. Gourley, K., Swanson, A., Royall, R., Woodworth, J., DeRouchey, J., Tokach, M., Dritz, S., Milnes, K., and Hastad, C. Effects of Timing and Amount of Feed Prior to Farrowing on Sow and Litter Performance Under Commercial Conditions. *Journal of Animal Science*, Volume 98, Issue Supplement_3, Nov 2020, Pages 100-101, <https://doi.org/10.1093/jas/skaa054.174>.
4. Becker, S. and Greiner, L.L. An investigation into the role of dietary essential fatty acids ratios and linoleic acid level on growth performance and inflammation of grow-finish

- pigs. *Journal of Animal Science*, Volume 99, Issue Supplement_1, May 2021, Page 63, <https://doi.org/10.1093/jas/skab054.105>.
5. Becker, S. and Greiner, L.L. An investigation into the role of dietary essential fatty acids ratios and energy level on growth performance, inflammation, and joint health of grow-finish pigs. *Journal of Animal Science*, Volume 99, Issue Supplement_1, May 2021, Pages 63-64, <https://doi.org/10.1093/jas/skab054.106>.
 6. Kiefer, Z.E., Chipman, A.L., Studer, J.M., Koester, L.R., Showman, L., Schmitz-Esser, S., Keating, A.F., Ross, J.W. Identification of putative factors associated with pelvic organ prolapse in sows during late gestation. 52nd Annual Meeting of the Society for the Study of Reproduction, Jul 18-21, 2019, page 351.
 7. Magalhaes, E.S., Thomas, P., Moura, C.A., Trevisan, G., Rademacher, C., Linhares, D.C.L. Whole-herd drivers of wean-to-finish mortality in a USA swine production system. Allen D. Lemman Swine Conference, Sep 14-17, 2019, Page 67.
 8. Magalhaes, E.S., Thomas, P., Moura, C.A., Trevisan, G., Rademacher, C., Linhares, D.C.L. Health Status, Seasonality, and Site Information as Predictors of Mortality in a U.S Swine Production System. ISU James D. McKean Swine Disease Conference, Nov 7-9, 2019, Pages 32-34.
 9. Sharp, K., Mills, L., Shirley, R., Garcia, R., Stewart, K.R. PSVII-21 Impacts of various farrowing induction protocols on attended farrowings. *Journal of Animal Science*, Volume 98, Issue Supplement_3, Nov 2020, Page 215, <https://doi.org/10.1093/jas/skaa054.373>.
 10. Moeller, G., Abell, C.L., Somrack, T., Herring, W.O., Holl, J.W., and Stalder, K. Distribution of subjectively evaluated conformation traits in commercial growing replacement gilts. *Journal of Animal Science*, Volume 98, Issue Supplement_3, Nov 2020, Pages 6-7, <https://doi.org/10.1093/jas/skaa054.010>.
 11. Kiefer, Z.E., Studer, J.M., Chipman, A.L., Koester, L.R., Schmitz-Esser, S., Ross, J.W. Towards improving pig livability: strategies to understand and mitigate sow mortality. *Journal of Animal Science*, Volume 98, Issue Supplement_4, Nov 2020, Pages 183-184, <https://doi.org/10.1093/jas/skaa278.338>.
 12. Kiefer, Z.E., Chipman, A.L., Studer, J.M., Gianluppi, R.D.F., Keating, A.F., Gabler, N.K., Ross, J.W. Steroid hormones are differentially abundant in sows with elevated risk for pelvic organ prolapse during late gestation. *Journal of Animal Science*, Volume 98, Issue Supplement_3, Nov 2020, Page 113, <https://doi.org/10.1093/jas/skaa054.191>.
 13. Kiefer, Z.E., Studer, J.M., Chipman, A.L., Ross, J.W. Characterization of putative biomarkers in sows with elevated risk for pelvic organ prolapse during late gestation. 53rd Annual Meeting of the Society for the Study of Reproduction, Jul 9-12, 2020, Delivered Virtually.
 14. Magalhaes, E.S., Thomas, P., Moura, C.A.A., Trevisan, G., Rademacher, C., Linhares, D.C.L. Identifying parameters associated with wean-to-finish mortality in a swine production system Annual Meeting American Association of Swine Veterinarians, Mar 7-10, 2020.
 15. Magalhaes, E.S., Thomas, P., Trevisan, G., Holtkamp, D., Rademacher, C., Zimmerman, J.J., Schwartz, L., Burrough, E., Linhares, D.C.L. Measuring the effect of disease diagnostic information on the mortality of growing pigs raised under field conditions. Annual Meeting American Association of Swine Veterinarians, Feb 27-Mar 4, 2021, Pages 299-300.
 16. Magalhaes, E.S., Thomas, P., Trevisan, G., Schwartz, K.J., Linhares, D.C.L. Measuring the association of disease diagnostic data on wean-to-finish mortality of pigs marketed in a large US swine production system. Allen D. Lemman Swine Conference, Sep 19-22,

2020, Page 54.

17. Magalhaes, E.S., Thomas, P., Trevisan, G., Moura, C.A.A., Holtkamp, D.J., Rademacher, C., Zimmerman, J.J., Linhares D.C.L. Measuring the impact of sow farm risk factors on the wean-to-finish mortality of pigs under field conditions. Allen D. Leman Swine Conference, Sep 19-22, 2020, Page 22.
18. Allen D. Leman Swine Conference Survivability Pre-Conference Seminar (2020). Delivered Virtually.
 - a. Gebhardt, J. Review of Post-Weaning Mortality in Commercial Production
 - b. Kiefer, Z.E. Identifying Biological Factors Associated with Pelvic Organ Prolapse: Vaginal Microbiome
 - c. Stewart, K.R. Best Practices of Colostrum Management
 - d. Christianson, M. Effects of Breed, Parity, and Teat Location on Swine Colostrum Composition and Production Traits
 - e. Magalhaes, E. Quantifying the Effect of Whole-Herd Health Parameters in Wean-to-Finish Survivability
 - f. DeRouchey, J. Fact Sheets, Videos, and Other Resources Available Through the Project
19. Magalhaes, E.S., Thomas, P., Moura, C.A.A., Trevisan, G., Holtkamp, D.J., Rademacher, C., Zimmerman, J.J., Linhares, D.C.L. Impact of health status and productivity of sow farms on subsequent wean-to-finish mortality. International Pig Veterinary Society Congress – IPVS, Nov 3-6, 2020, Page 468.
20. Kiefer, Z.E., Chipman, A.L., Showman, L., Keating, A.F., and Ross, J.W. Serum Trace Minerals in Late Gestation Sows at Variable Risk for Pelvic Organ Prolapse. *Journal of Animal Science*, Volume 99, Issue Supplement_1, May 2021, Pages 111-112, <https://doi.org/10.1093/jas/skab054.183>.
21. Magalhaes, E.S., Rosero, S., Donovan, T., Thomas, P., Moura, C.A.A., Trevisan, G., Holtkamp, D., Zimmerman, J.J., Rademacher, C., Linhares, D.C.L. Consolidating diverse and disperse datasets to reveal production system-specific drivers of swine performance under field conditions. Annual Meeting American Association of Swine Veterinarians, Seminar # 3. Feb 27, 2021, Pages 31-32.
22. Sundman, E.R., Gabler, N.K., Millman, S.T., Stalder, K.J., Karriker, L.A., Johnson, A.K. Nutritional enrichment to improve the welfare of nursery-aged swine at weaning. Merck's Advancing Animal Welfare Together (AAWT) Symposium, Nov 16, 2021.
23. Nickel, M., Rademacher, C., Skoland, K., Brown, J., Ruston, C., Kittrell, H., Karriker, L. Comparison of antibiotic treatment regimens for naturally occurring, multi-etiology disease challenges in a commercial nursery facility. 52nd Annual Meeting of the American Association of Swine Veterinarians, Mar 2021, Virtual.
24. Boschert, A.W., Wensley, M.R., Tokach, M.D., Goodband, R.D., Gebhardt, J.T., Woodworth, J.C., DeRouchey, J.M., and Stephenson, E. PSI-2 Effect of Gruel Feeding and Oral Dextrose on the Survivability of Pigs After Weaning, *Journal of Animal Science*, Volume 100, Issue Supplement_2, May 2022, Page 201, <https://doi.org/10.1093/jas/skac064.339>.
25. Wensley, M.R., Tokach, M.D., Goodband, R.D., Gebhardt, J.T., Woodworth, J.C., DeRouchey, J.M., and Stephenson, E. PSII-13 Effect of Body Weight, Body Temperature, and Blood Glucose on the Survivability of Pull Pigs After Removal, *Journal of Animal Science*, Volume 100, Issue Supplement_2, May 2022, Page 135, <https://doi.org/10.1093/jas/skac064.231>.
26. Wensley, M.R., Tokach, M.D., Goodband, R.D., Gebhardt, J.T., Woodworth, J.C., DeRouchey, J.M., McKilligan, D., and Upah, N. PSIII-19 Effect of Sensory Attractants

- Before and After Weaning on Nursery Pig Performance, *Journal of Animal Science*, Volume 100, Issue Supplement_2, May 2022, Pages 142–143, <https://doi.org/10.1093/jas/skac064.243>.
27. Kim, T., Wensley, M.R., Tokach, M.D., Goodband, R.D., Gebhardt, J.T., Woodworth, J.C., DeRouchey, J.M., McKilligan, D., and Upah, N. 2022. Effects of Providing a Liquid Sensory Attractant to Suckling Pigs in Lactation and After Weaning on Post-Weaning Pig Performance, *Journal of Animal Science*, Volume 100, Issue Supplement_2, May 2022, Pages 126–127, <https://doi.org/10.1093/jas/skac064.215>.
 28. Wensley, M.R., Tokach, M.D., Goodband, R.D., Gebhardt, J.T., Woodworth, J.C., and DeRouchey, J.M. 2022. Young Scholar Award Talk: Strategies to Maintain Nutrient Intake, Reduce Weight Loss, and Improve Livability in Newly Weaned Pigs, *Journal of Animal Science*, Volume 100, Issue Supplement_3, Oct 2022, Page 196, <https://doi.org/10.1093/jas/skac247.360>.
 29. Holen, J.P., Woodworth, J.C., Tokach, M.D., Goodband, R.D., DeRouchey, J.M., Gebhardt, J.T., DeDecker, A., and Martinez, X. 2022. Evaluation of Essential Fatty Acids in Lactating Sow Diets on Sow Reproductive Performance, Colostrum and Milk Composition, and Pre-Weaning Litter Growth and Survivability, *Journal of Animal Science*, Volume 100, Issue Supplement_2, May 2022, Pages 22–23, <https://doi.org/10.1093/jas/skac064.036>.
 30. Holen, J.P., Woodworth, J.C., Tokach, M.D., Goodband, R.D., DeRouchey, J.M., Gebhardt, J.T., DeDecker, A., and Martinez, X. 2022. Awardee Talk: Evaluating the Impact of Essential Fatty Acids in Lactation Diets on Sow and Litter Performance, *Journal of Animal Science*, Volume 100, Issue Supplement_2, May 2022, Page 112, <https://doi.org/10.1093/jas/skac064.190>.
 31. Becker, S. and Greiner, L.L. PSVII-8 The Impact of Dietary Essential Fatty Acids Ratios and Unsaturated: Saturated Ratio on Growth Performance of Grow-Finish Pigs, *Journal of Animal Science*, Volume 100, Issue Supplement_2, May 2022, Pages 170–171, <https://doi.org/10.1093/jas/skac064.290>.
 32. Magalhaes, E.S., Trevisan, G., Holtkamp, D., Zimmerman, J.J., Silva, G.S., Linhares, D.C.L. Consolidating production, management and health data from all phases of production to assess the causes of wean-to-finish mortality. International Pig Veterinary Society Congress – IPVS, June 21-24, 2022, Page 575.
 33. Magalhaes, E.S., Thomas, P., Trevisan, G., Holtkamp, D., Rademacher, C., Zimmerman, J.J., Schwartz, L., Burrough, E., Linhares, D.C.L. Application of aggregated histopathology data to assess disease impact in growing pig populations. International Pig Veterinary Society Congress – IPVS, June 21-24, 2022, Page 506.
 34. Kiefer, Z.E., Koester, L.R., Studer, J.M., Mainquist-Whigham, C., Schmitz-Esser, S., and Ross, J.W. Evaluation of the Fecal Microbiota in Commercial Sows with Variable Risk for Pelvic Organ Prolapse During Late Gestation. *Journal of Animal Science*, Volume 100, Issue Supplement_2, May 2022, Page 89, <https://doi.org/10.1093/jas/skac064.145>.
 35. Kiefer, Z.E., Koester, L.R., Studer, J.M., Schmitz-Esser, S., and Ross, J.W. Correlations between vaginal and fecal microbiota in commercial sows with variable risk for pelvic organ prolapse during late gestation. 55th Annual Meeting of the Society for the Study of Reproduction, Jul 2019.
 36. Dunkelberger J.R., Stevens, T., Bhatia, V., Ross, J.W., Dekkers, J.C.M., and Knol, E.F. 2023. Breeding robust sows for commercial conditions. Allen D. Leman Swine Conference, Sep 16, 2023.
 37. DeRouchey, J. M., Ross, J. W., Rademacher, C., Tokach, M. D., Woodworth, J. C.,

Matchan, S., Linhares, D. C., Johnson, A. K., Schulz, L., Stewart, K. R., Dekkers, J. C., Greiner, L. L., Gabler, N. K., & Gebhardt, J. T. 2024. 37 Key learnings from the improving pig survivability project. *Journal of Animal Science*, Volume 102 Issue Supplement_2, May 2024, Pages 237–238, <https://doi.org/10.1093/jas/skae102.271>.

Poster Presentations

1. “Measuring the association of disease diagnostic data on wean-to-finish mortality of pigs marketed in a large US swine production system.” by Edison Magalhaes. Proceedings of the Allen D. Leman Swine Conference. Poster 53. September 14, 2020.
2. “Use of biologically relevant enrichment to improve nursery-aged pig weaning transition” by Alexandria Geary. Honors project. December 8, 2021.
3. “Sow performance association with body condition measured prior to and after farrowing” by William Taylor. Iowa Pork Congress. January 26-27, 2022.
4. “Use of biologically relevant enrichment to improve the weaning transition of nursery-aged swine” by Emiline Sundman. Senior Honors Project, Iowa State University Honors Poster Presentation. February 2, 2022.
5. “Effects of novel nutritional enrichment on pig feeder aggression during early weaning” by Emiline Sundman. Senior Honors Project, Iowa State University Honors Poster Presentation. February 2, 2022.
6. “Effect of gruel feeding and oral dextrose on the survivability of pigs after weaning” by Andrew Boschert. American Society of Animal Science Midwest Meeting. March 14, 2022.
7. “Effect of body weight, body temperature, and blood glucose on the survivability of cull pigs after removal” by Madie Wensley. American Society of Animal Science Midwest Meeting. March 14, 2022.
8. “Effect of sensory attractants before and after weaning on nursery pig performance” by Madie Wensley. American Society of Animal Science Midwest Meeting. March 14, 2022.
9. “Confirmation of the Genetic Basis of Sow Pelvic Organ Prolapse (POP) Using Genomic Data” by Vishesh Bhatia. Allen D. Leman Swine Conference. September 17-20, 2022.
10. “Genomic Regions Associated with susceptibility to Sow Pelvic Organ Prolapse” by Vishesh Bhatia. Plant and Animal Genome 30. January 13-18, 2023.
11. “Identification of the Genetic Basis of Sow Pelvic Organ Prolapse” by Vishesh Bhatia. Iowa Pork Congress. January 25-26, 2023.
12. “How to reduce sow mortality in gestating sows” by Chris Rademacher. American Association of Swine Veterinarians 56th Annual Meeting. March 1-4, 2025.

Published Proceedings

1. Kiefer, Z.E., Chipman, A.L., Studer, J., Johnson, C., Rademacher, C.J., Linhares, D.C.L., Ross, J.W. 2019. Update on Prolapses and Pig Survivability Initiative. James D. McKean Swine Disease Conference. Ames, Iowa. November 7-8.
2. Schulz, L.L. Sensitivity Analysis of Net Returns to Mortality. Pre-Conference Seminar: Raising Pigs for Dummies (Keep them Alive). Proceedings of the 52nd Annual Meeting of the American Association of Swine Veterinarians.
3. Schulz, L.L. Economics of Mortality- With a Look at Decision Tools to Help Improve it. 2023 Banff Pork Seminar Proceedings. January 11, 2023.
4. Gebhardt, J., S. Matchan, J. Ross, J. Dekkers, S. Canavate, C. Rademacher, C. Johnson, M. Tokach, E. Magalhaes, J. Woodworth, and J. DeRouchey. 2023. Improving pig survivability through research and collaboration. Proceedings of the 54th Annual Meeting

of the American Association of Swine Veterinarians.

5. Tokach, M., Doughan, G., Mendoza, O., Magalhaes, E., Bengé, N., Burton, B., Haden, C., Rosa, G., Gebhardt, J. 2024 Improving pig survivability through research and collaboration. Proceedings of the 55th Annual Meeting of the American Association of Swine Veterinarians.

Invited Presentations

1. “An integrated approach to improve whole herd pig survivability. National Pork Board Webex Webinar, August 27th, 2019.
2. “Current efforts towards improving pig livability.” Allen D. Leman Swine Conference. Minneapolis, MN. September 16th, 2019.
3. “An industry-wide approach to better understand the putative causes of pelvic organ prolapse in sows”. Zoetis Technical Service Team Webinar, September 20th, 2019.
4. Magalhaes ES. “Investigating wean-to-finish causes of mortality.” Leman Conference. Brazilian Symposium (session in Portuguese). Saint Paul, MN. September 2019.
5. “An industry-wide approach to better understand the putative causes of pelvic organ prolapse in sows” Medicated Feed Additive Expert Council. Des Moines, IA. October 22nd, 2019.
6. “An industry-wide approach to better understand the putative causes of pelvic organ prolapse in sows” North Carolina Veterinary Medical Association Swine Veterinary Conference. Raleigh, NC, November 1st, 2019.
7. Magalhaes ES. “Drivers of wean-to-finish mortality and the impact of disease status.” 2019 North American PRRS Symposium. Chicago, Illinois. November 2019.
8. “An update on prolapses and the pig survivability initiative”. Iowa State University James D. McKean Swine Disease Conference. Ames, IA, November 8th, 2019.
9. Magalhaes ES. “Health Status, Seasonality, and Site Information as Predictors of Mortality in a U.S Swine Production System.” James D. McKean Swine Disease Conference. Ames, Iowa. November 2019.
10. “Update on Prolapses and Pig Survivability Initiative” Online Webinar for the Nutriquest Technical Team. December 4th, 2019.
11. “The importance of colostrum.” National Swine Improvement Federation Annual Meeting. Indianapolis, IN. December 5-6th, 2019.
12. “Distribution of subjectively evaluated conformation traits in commercial growing replacement gilts” Midwest ASAS, Omaha, NE. March 3, 2020.
13. “Steroid hormones are differentially abundant in sows with elevated risk for pelvic organ prolapse during late gestation” Midwest ASAS Meeting, Omaha, NE. March 3, 2020.
14. “An industry-wide approach to better understand pelvic organ prolapse in sows”. American Association of Swine Veterinarians Annual Meeting. Atlanta, GA. March 8th, 2020.
15. “Towards improving pig livability: Strategies to understand and mitigate sow mortality”. American Society of Animal Science Annual Meeting. Virtual Presentation, July 22, 2020.
16. “Opportunities to enhance wean-to-finish pig survival”. American Society of Animal Science Annual meeting. July 22, 2020.
17. Gebhardt, J. “Review of Post-Weaning Mortality in Commercial Production”. Allen D. Leman Swine Conference Survivability Pre-Conference Seminar. September 19, 2020.
18. Magalhaes ES. “Quantifying the effect of whole-herd health parameters in wean-to-finish survivability.” 2020 Leman Conference. Survival Workshop: Updates and Resources from the Improving Pig Survivability Project. September 19-22, 2020.

19. : Vaginal Microbiome". Allen D. Leman Swine Conference Survivability Pre-Conference Seminar. September 19, 2020.
20. Stewart, K. "Best Practices of Colostrum Management". Allen D. Leman Swine Conference Survivability Pre-Conference Seminar. September 19, 2020.
21. Christianson, M. "Effects of Breed, Parity, and Teat Location on Swine Colostrum Composition and Production Traits". Allen D. Leman Swine Conference Survivability Pre-Conference Seminar. September 19, 2020.
22. Magalhaes, E. "Quantifying the Effect of Whole-Herd Health Parameters in Wean-to-Finish Survivability". Allen D. Leman Swine Conference Survivability Pre-Conference Seminar. September 19, 2020.
23. DeRouchey, J. "Fact Sheets, Videos, and Other Resources Available Through the Project". Allen D. Leman Swine Conference Survivability Pre-Conference Seminar. September 19, 2020.
24. "Survivability project updates." Kansas State University Swine Industry Day. November 18, 2022.
25. Tokach, M. "Maintaining continuity of nutrient intake after weaning: Pre- and post-weaning strategies". KSU Swine Day. November 19, 2020.
26. Feeding sows immediately before farrowing-What have we learned? Kansas State University Swine Day. November 19, 2020.
27. "Factors associated with pig livability in the post-weaning period" American Association of Swine Veterinarians 2021 Annual meeting. February 28, 2021.
28. Sensitivity Analysis of Net Returns to Mortality. Pre-Conference Seminar: Raising Pigs for Dummies (Keep them Alive). Invited presentation at the 52nd Annual Meeting of the American Association of Swine Veterinarians. February 28, 2021.
29. "Factors associated with pig livability in the post-weaning period". 2021 AASV Annual Meeting, virtual. February 28, 2021.
30. Tokach, M. "Preparing for a low zinc world" American Association of Swine Veterinarians National Meeting. March 1, 2021.
31. "An investigation into the role of dietary essential fatty acids ratios and linoleic acid level on growth performance and inflammation of grow-finish pigs". Midwest ASAS, Virtual Conference. March 2021.
32. Linhares, DCL. Revealing causal associations and forecasting productivity from consolidated datasets. September 20, 2021. Allen D. Leman Swine Conference. St. Paul, MN.
33. "Economics of Mortality." International Conference on Pig Survivability. October 27th, 2021.
34. "Success, failures and actions on post-weaning survivability." International Conference on Pig Survivability. October 27th, 2021.
35. "Sow survivability: Pelvic organ prolapse." International Conference on Pig Survivability. October 28th, 2021.
36. "Early identification and treatment of at-risk sows." International Conference on Pig Survivability. October 28th, 2021.
37. "Nutritional enrichment to improve the weaning transition in nursery aged pigs." International Conference on Pig Survivability. October 28th, 2021.
38. "Attempts to maintain feed intake and reduce weight loss after weaning." International Conference on Pig Survivability. October 28th, 2021.
39. "The use of attractants to stimulate neonatal piglet interest in rope enrichment." International Conference on Pig Survivability. October 28th, 2021.
40. "Impact of essential fatty acids in lactation diets on sow and litter performance."

- International Conference on Pig Survivability. October 28th, 2021.
41. "The effects of heat lamp placement on piglet mortality." International Conference on Pig Survivability. October 28th, 2021.
 42. "Farrowing induction impacts on piglet viability and survival." International Conference on Pig Survivability. October 28th, 2021.
 43. "Opportunities for measurable impact" International Conference on Pig Survivability. October 28th, 2021.
 44. "Creating good lactating sows: how many meals pre-farrow is best." International Conference on Pig Survivability. October 28th, 2021.
 45. "Assembling whole-herd data to reveal causal patterns and forecasting grow-finish survivability." International Conference on Pig Survivability. October 28th, 2021.
 46. "Nutritional enrichment to improve the welfare of nursery-aged swine at weaning". Merck's Advancing Animal Welfare Together (AAWT) Symposium, Orlando, FL. November 16, 2021.
 47. "Survivability project updates." Kansas State University Swine Industry Day. November 18, 2022.
 48. "Pre-weaning mortality – opportunity for impact". National Swine Improvement Federation Annual Meeting, St. Louis, MO. November 30, 2021.
 49. "Interventions to reduce mortalities: pre-weaning." SowBridge. December 1, 2021.
 50. "Colostrum and managing the young pig." Iowa Pork Industry Center Sow Summit. December 8, 2021.
 51. "Pelvic organ prolapse: research updates and future directions." Iowa Pork Industry Center Sow Summit. December 8, 2021.
 52. "Monitoring sow health and implementation of interventions." Iowa Pork Industry Center Sow Summit. December 8, 2021.
 53. "On farm strategy to impact sow mortality." Iowa Pork Industry Center Sow Summit. December 8, 2021.
 54. "Sow survivability." Ohio Pork Congress. February 9, 2022.
 55. "Piglet survivability." Standard Nutrition sow farm managers meeting. February 23, 2022
 56. "Technologies for farrowing efficiency and piglet survival." ASAS Midwest Animal Science Annual Meeting. March 14, 2022.
 57. "Effect of floor feeding creep feed on the growth performance and morbidity and mortality of pigs after weaning." ASAS Midwest Animal Science Annual Meeting. March 14, 2022.
 58. "Effect of mat feeding on the growth performance and morbidity and mortality of pigs after weaning." ASAS Midwest Animal Science Annual Meeting. March 14, 2022.
 59. "Effects of providing a liquid sensory attractant to suckling pigs in lactation and after weaning on post-weaning pig performance." ASAS Midwest Animal Science Annual Meeting. March 14, 2022.
 60. "Effect of gruel feeding and oral dextrose on the survivability of pigs after weaning." ASAS Midwest Animal Science Annual Meeting. March 14, 2022.
 61. "Evaluation of essential fatty acids in lactating sow diets on sow reproductive performance, colostrum and milk composition, and pre-weaning litter growth and survivability." ASAS Midwest Animal Science Annual Meeting. March 14, 2022.
 62. "Evaluating the Impact of Essential Fatty Acids in Lactation Diets on Sow and Litter Performance." ASAS Midwest Animal Science Annual Meeting. March 14, 2022.
 63. "Water and feed-based arginine impacts on gut integrity in weanling pigs." ASAS Midwest Animal Science Annual Meeting. March 14, 2022.
 64. "Evaluation of the fecal microbiota in commercial sows with variable risk for pelvic

- organic prolapse during late gestation.” ASAS Midwest Animal Science Annual Meeting. March 14, 2022.
65. “Body condition association with production records and feed management decisions.” ASAS Midwest Animal Science Annual Meeting. March 14, 2022.
 66. “Farrowing induction and impacts on piglet survival.” Penn State Producer Meeting. March 29, 2022.
 67. “Update on impact of structural conformation scores on survivability in stalled and group house gestation facilities.” Meeting with Iowa producer and genetics company. March 31, 2022.
 68. “Neonatal piglet interaction with environmental enrichment ropes and impacts on mortality and litter weight gain.” North American International Society of Applied Ethology. April 2022.
 69. “How can you improve livability in pig production.” Webinar. May 26, 2022.
 70. “Economics of Nursery Mortality.” Zinpro Pre-World Pork Expo Meeting. June 7, 2022.
 71. “Early identification of treatment of sows.” PIC. June 17, 2022.
 72. “Early identification of treatment of sows.” International Pig Veterinary Society Congress. June 21, 2022.
 73. “Young scholar award talk: Strategies to maintain nutrient intake, reduce weight loss, and improve livability in newly weaned pigs.” National ASAS meeting. June 29, 2022.
 74. “Decision maker tools for improving mortality.” Iowa Swine Day. June 30, 2022.
 75. “A practical approach to early intervention to reduce sow mortality.” Iowa Swine Day. June 30, 2022.
 76. “Causes of and strategies to minimize post-weaning mortality in commercial swine production.” AMVEC pre-congress seminar. July 14, 2022.
 77. “POP microbiota data comparing the vaginal and fecal communities.” Society for the Study of Reproduction Annual Meeting. July 26, 2022.
 78. “POP risk factors.” Carthage Veterinary Service Swine Conference. August 23, 2022.
 79. “Sow treatment.” Carthage Veterinary Service Swine Conference. August 23, 2022.
 80. “Validation of scan sampling techniques for nursery pig feeder and enrichment use.” Congress of International Society of Applied Ethology. September 4-8, 2022.
 81. “Importance of colostrum to the developing gilt.” Allen D. Leman Swine Conference Pre-Conference Sessions. September 17, 2022.
 82. “Identifying at risk sows, a case control study.” Allen D. Leman Swine Conference Pre-Conference Sessions. September 17, 2022.
 83. “Introduction and sow livability resources.” Allen D. Leman Swine Conference Sow Livability Seminar. September 19, 2022.
 84. “Prolapses in sows- what we know, what has been done, where we go.” Allen D. Leman Swine Conference Sow Livability Seminar. September 19, 2022.
 85. “Improved sow livability through refocused individual attention.” Allen D. Leman Swine Conference Sow Livability Seminar. September 19, 2022.
 86. “What our system has done to improve sow livability.” Allen D. Leman Swine Conference Sow Livability Seminar. September 19, 2022.
 87. “Economics of sow mortality - newly developed calculator.” Allen D. Leman Swine Conference Sow Livability Seminar. September 19, 2022.
 88. “Discussion and take-home practices.” Allen D. Leman Swine Conference Sow Livability Seminar. September 19, 2022.
 89. “Introduction and pre-wean, nursery and finishing livability resources.” Allen D. Leman Swine Conference Birth to Market Livability Seminar. September 20, 2022.
 90. “Colostrum- how much can we move the needle.” Allen D. Leman Swine Conference

- Birth to Market Livability Seminar. September 20, 2022.
91. "What our system has done to improve wean-to-finish livability." Allen D. Leman Swine Conference Birth to Market Livability Seminar. September 20, 2022.
 92. "Improving livability through grow-finish biosecurity." Allen D. Leman Swine Conference Birth to Market Livability Seminar. September 20, 2022.
 93. "Economics of wean-to-finish mortality – a newly developed calculator." Allen D. Leman Swine Conference Birth to Market Livability Seminar. September 20, 2022.
 94. "Discussion and take-home practices." Allen D. Leman Swine Conference Birth to Market Livability Seminar. September 20, 2022.
 95. "Identification and Intervention for Reducing Sow Mortality." Saskatchewan Pork Industry Symposium 2022. November 15, 2022.
 96. "Effect of a small dose of colostrum provided at birth on newborn piglets' behavior, growth and survival." International Scientific Meeting on Colostrum. November 2022.
 97. "Economics of Mortality – With a Look at Decision Tools to Help Improve it." Piflet Management Breakout Session at 2023 Banff Pork Seminar. Banff, Alberta Canada. January 11, 2023.
 98. "Introduction and overview of the Pig Survivability project." American Association of Swine Veterinarians Annual Meeting. March 4, 2023.
 99. "Overview of sow pelvic organ prolapse research." American Association of Swine Veterinarians Annual Meeting. March 4, 2023.
 100. "Is there a genetic basis for pelvic organ prolapse?" American Association of Swine Veterinarians Annual Meeting. March 4, 2023.
 101. "Sow robustness: Key areas to maximize sow retention." American Association of Swine Veterinarians Annual Meeting. March 4, 2023.
 102. "Early identification of at-risk sows reduces sow mortality." American Association of Swine Veterinarians Annual Meeting. March 4, 2023.
 103. "Managing noninfectious causes of sow mortality." American Association of Swine Veterinarians Annual Meeting. March 4, 2023.
 104. "Overview of nutritional, genetic, and management strategies to influence mortality after weaning." American Association of Swine Veterinarians Annual Meeting. March 4, 2023.
 105. "Postweaning mortality: Key findings through data analysis." American Association of Swine Veterinarians Annual Meeting. March 4, 2023.
 106. "Overview of available resources and producer tools." American Association of Swine Veterinarians Annual Meeting. March 4, 2023.
 107. "Key Sow Mortality and Sow Herd Health Correlation Findings." National Hog Farmers Global Hog Industry Virtual Conference: Improving Pig Survivability Project. May 2023.
 108. "Key Postweaning Nutrition & Management Findings and Educational Resources." National Hog Farmers Global Hog Industry Virtual Conference: Improving Pig Survivability Project. May 2023.
 109. "Advancing Profits and Sustainability by Improving Pig Survivability." World Pork Expo. June 8, 2023.
 110. "Identification and Intervention for Reducing Sow Mortality." National Pork Industry Conference. July 10, 2023
 111. "Swine Education and Outreach Professionals- Q2 2023 Webinar: Improving Pig Survivability." National Pork Board. August 23, 2023.
 112. Rademacher, C. "A Practical approach to early intervention to reduce sow mortality" Sow Bridge Educational Series. October 4. 2023.

113. Tokach, M. “Early life gut development, feeding, management practices to maximize livability” American Association of Swine Veterinarians National Meeting. February 24, 2024.
114. Doughan, G. “Water line biology and considerations for pig livability” American Association of Swine Veterinarians National Meeting. February 24, 2024.
115. Magalhaes, E. “Identification of drivers of mortality, identifying action items, and economic outcomes” American Association of Swine Veterinarians National Meeting. February 24, 2024.
116. Gebhardt, J. “Pig Livability: What works, what doesn’t” American Association of Swine Veterinarians National Meeting. February 24, 2024.
117. American Association of Swine Veterinarians (AASV) Annual Meeting Pre-Conference Seminar (2023), Denver, CO.
 - a. Matchan, S. Introduction and brief overview of the Pig Survivability project.
 - b. Ross, J. Overview of sow pelvic organ prolapse research.
 - c. Dekkers, J. Is there a genetic basis for pelvic organ prolapse?
 - d. Canavate, S. Sow Robustness: Key areas to maximize sow retention
 - e. Rademacher, C. Early identification of at risk sows reduces sow mortality
 - f. Johnson, C. Managing non-infectious causes of sow mortality
 - g. Tokach, M. Overview of nutritional, genetic, and management strategies to influence mortality after weaning.
 - h. Magalhaes, E. Post-weaning mortality – key findings through data analysis
 - i. DeRouchey, J. Overview of available resources and producer tools.
118. American Association of Swine Veterinarians (AASV) Annual Meeting Pre-Conference Seminar (2024), Nashville TN.
 - a. Tokach, M. Early life gut development, feeding, management practices to maximize livability
 - b. Doughan, G. Water line biology and considerations for pig livability.
 - c. Mendoza, O. Recent research findings focused on wean-finish survivability.
 - d. Magalhaes, E. Identification of drivers of mortality, identifying action items, and economic outcomes.
 - e. Benge, N. Improving sow livability with individual sow care and husbandry.
 - f. Burton, B. A focus on sow care to maximize systemic livability.
 - g. Haden, C. First-hand experiences and lessons learned with preweaning mortality.
 - h. Rosa, G. Addressing pig mortality through understanding of transportation losses.
 - i. Gebhardt, J. Key findings of the Improving Pig Survivability project.
119. Rademacher, C. “The Importance of Early Identification of At Risk Sows and Learnings From the Improving Pig Survivability Project” DSM-Firmenich Pork Nexus. October 24-25. 2024.
120. Rosero, D. “Improving Sow Livability – A Collaborative Approach” Banff Pork Seminar. January 7-9, 2025.
121. DeRouchey, J. “Key Findings in Post-Weaning Mortality Research & Pig Livability Project Producer Resources” Banff Pork Seminar. January 7-9, 2025.
122. “Effect of litter size relative to functional teat count on lactating sows and litter performance.” ASAS Midwest Animal Science Annual Meeting. March 10, 2025.
123. “Evaluation of split suckling strategies on pre-wean piglet growth and mortality for high-producing sows.” ASAS Midwest Animal Science Annual Meeting. March 11, 2025.

Digital Interviews

Popular Press and animal industry reports

1. Impact of pre-farrowing feed management strategies. National Hog Farmer. May 14, 2020.
2. Weaning age and antibiotic use for pigs evaluated. National Hog Farmer. July 9, 2020.
3. Structural soundness, gilt selection impact on future sow longevity. National Hog Farmer, August 4, 2020.
4. Maintaining continuity of nutrient intake after weaning: preweaning strategies. National Hog Farmer, March 11, 2021.
5. Research review focuses on managing nutrient intake during weaning stages. National Hog Farmer, March 17, 2021.
6. Maintaining continuity of nutrient intake after weaning: postweaning strategies. National Hog Farmer, May 13, 2021.
7. Nutritional enrichment effect on behavior, performance during early weaning. National Hog Farmer. October 21, 2021.
8. K-State researchers uncover clues to improving pig survivability. K-State Research and Extension, November 4, 2021.
9. Evaluation of supplemental fat sources and pre-farrow essential fatty acid intake on lactating sow performance and essential fatty acid composition of colostrum, milk, and adipose tissue. Kansas State University Swine Day, November 18, 2021.
10. Effect of floor feeding creep feed on the growth performance and mortality of pigs after weaning. Kansas State University Swine Day, November 18, 2021.
11. Effects of providing a liquid sensory attractant to suckling pigs in lactation and after weaning on post-weaning pig performance. Kansas State University Swine Day, November 18, 2021.
12. Effects of providing enrichment cubes to suckling pigs in late lactation and after weaning on post-weaning pig performance. Kansas State University Swine Day, November 18, 2021.
13. Effects of providing a sensory attractant powder to suckling pigs in late lactation and after weaning on post-weaning pig performance. Kansas State University Swine Day, November 18, 2021.
14. Effects of mat feeding on the growth performance and mortality of pigs after weaning. Kansas State University Swine Day, November 18, 2021.
15. Pelvic organ prolapse: on-farm considerations. National Hog Farmer. February 2, 2022.
16. How do mat and gruel feeding impact pig survivability? Pork Business. February 8, 2022.
17. Does EFA in lactation diet impact sow, litter performance? National Hog Farmer. May 4, 2022.
18. Attracting neonatal piglets away from the sow. National Hog Farmer. May 6, 2022.
19. Can sow mortality be influenced by early identification, treatment? National Hog Farmer. May 10, 2022.
20. The perplexing issue of uterine prolapse: how genetics fit. Pork Business. June 22, 2022.
21. Evaluation of fat sources on swine lameness and growth. National Hog Farmer. July 5, 2022.
22. Early Identification of treatment of sows. National Hog Farmer. August 19, 2022.
23. Effects of nutritional enrichment on pig feeder aggression and performance during early weaning. Animal Industry Report, September 18, 2022.
24. Neonatal piglet interaction with environmental enrichment ropes. Accepted Animal Industry Report. 2022.

25. Use of biologically relevant enrichment to improve nursery-aged pig weaning transition. Accepted Animal Industry Report. 2022.
26. Key findings regarding post-weaning mortality. National Hog Farmer. February 7, 2023.
27. Structural conformation impacts on sow longevity. National Hog Farmer. April 4, 2023.
28. 5 Ways to Improve Sow Longevity. Pork Business. April 27, 2023.
29. Genetic Basis of Sow Pelvic Organ Prolapse. National Hog Farmer. June 6, 2023.
30. Heritability of Pelvic Organ Prolapse in Sows is Higher Than Previously Thought. Farm Journals Pork. July 18, 2023
31. Colostrum: The Key to Piglet Livability. Farm Journal's Pork. July/August 2023
32. The Superpower Swine Farms Need Now. Farm Journal's Pork. March/April 2024
33. Validation of scan sampling techniques for nursery pig feeder- and nutritional enrichment use. Accepted Animal Industry Report. 2024.
34. Take a practical approach to reduce sow mortality. National Hog Farmer. April 26, 2024.
35. Back to basics: Simple management shifts reduce sow mortality. National Hog Farmer. April 15, 2025.

Factsheets

1. Stewart, K. Importance of Colostrum on Survival of Newborn Piglets (Available in English and Spanish)
2. K-State Team. Importance of Weaning Age on Survival of Wean-to-Finish Pigs (Available in English and Spanish)
3. K-State Team. Importance of Providing Injectable Iron to Newborn Piglets (Available in English and Spanish)
4. Spinler, M. and Rademacher, C. Individual Pig Care and Early Detection of Sick Pigs (Available in English and Spanish)
5. Elefson, E., Hagen, C., Greiner, L. Sow Body Condition Score and Survivability (Available in English and Spanish)
6. Suarez-Trujillo, A. and Stewart, K. Importance of Body Temperature on Piglet's Success (Available in English and Spanish)
7. K-State Team. Impact of Essential Fatty Acids on Sow and Litter Performance (Available in English and Spanish)
8. K-State Team. Gruel Feeding Nursery Pigs (Available in English and Spanish)
9. Euken, R. and L. Schulz. Assessing Economic Opportunity of Improving Mortality Rate in Wean-to-Finish Swine Production *Ag Decision Maker B1-78*
10. Euken, R. and L. Schulz. Assessing Economic Opportunity of Improving Mortality Rate in Breed-to-Wean Swine Production *Ag Decision Maker B1-79*
11. Kiefer, Z., Studer, J., Ross, J. Pelvic Organ Prolapse: Perineal Score Evaluation. (Available in English and Spanish)
12. Chipman, C. and Ross, J. Sow Mortality Project Update: Sow Body Conditioning score.
13. Chipman, C. and Ross, J. Water Treatment and Pelvic Organ Prolapse
14. Chipman, C. and Ross, J. Sow Mortality Project Summary
15. Statler, A and Stewart, K. Cross-Fostering Practices Explained (Available in English and Spanish)
16. deNeui, G and Stewart, K. The Common Practice of Split Suckling (Available in English and Spanish)
17. Walthart, B. Biosecurity Principles (Available in English and Spanish)
18. Walthart, B. and Skoland K. Pig Movement Principles (Available in English and Spanish)
19. Walthart, B. Early Identification of Lameness in Growing Pigs (Available in English and

Spanish)

20. Walthart, B. and Brown, J. Early Identification of At-Risk Sows in the Farrowing House (Available in English and Spanish)
21. Walthart, B. and Petersen, M. Early Identification of Sick Pigs in the Nursery (Available in English and Spanish)
22. Walthart, B. Early Detection of At-Risk Pigs in the Finisher: Four Circles Approach (Available in English and Spanish)
23. Walthart, B. Newborn Piglet Principles (Available in English and Spanish)
24. Ramirez, B. Ventilation Management (Available in English and Spanish)
25. Sundman, E., Johnson, A., Gabler, N., Karriker, L., Stalder, K., and Millman, S. Pig Environment Enrichment (Available in English and Spanish)
26. Rademacher, C. A Practical Approach to Early Intervention to Reduce Sow Mortality: SOP (Available in English and Spanish)
27. Huber, A. Swine Euthanasia (Available in English and Spanish)
28. Coursey, E. Best Practices for Moving and Sorting Pigs (Available in English and Spanish)
29. Kieffer, L. Addressing Sow Lameness with an Emphasis on Claw Lesions
30. Spinler, M., Swanson, S., Due, E., Lashley, M., Hartman, A., Gebhardt, J., Gaffield, K., DeRouchey, J., Tokach, M., Goodband, R., and Woodworth, J. Evaluation of Split Suckling on Pre and Post Weaning Performance and Mortality
31. Jenkins, A., Collier, S., DeRouchey, J., Tokach, M., Woodworth, J., Gaffield, K., Gebhardt, J., Goodband, R., Coble, K., Corns, P., Barerra, E., Arteaga, I., Karl, J., and Bradley, T. Peripartum Calcium Administration Strategies Influence on Farrowing Performance, Stillbirths and Piglet Livability
32. Jenkins, A., Collier, S., DeRouchey, J., Tokach, M., Woodworth, J., Gaffield, K., Gebhardt, J., Goodband, R., Coble, K., Corns, P., Karl, J., Bradley, T., Barerra, E., and Arellanes, M. Litter Size Relative to Functional Teat Count on Lactating Sow and Litter Performance

Videos

1. Review of post-weaning mortality in commercial swine production Part 1: Non-infectious factors.
2. Review of post-weaning mortality in commercial swine production Part 2: Infectious factors.
3. Feeding strategies prior to farrowing and the impact on litter performance.
4. Feeding strategies prior to farrowing and the impact on sow performance.
5. Whole herd drivers of wean-to-finish mortality.
6. Identifying biological factors associated with pelvic organ prolapse: vaginal microbiome.
7. Strategies for Selection and Identifying Replacement Gilts Reproductive Tract Development: Part 1.
8. Importance of providing injectable iron to newborn piglets.
9. Effects of induction on the farrowing process and piglet blood parameters at time of farrowing.
10. Pre-weaning strategies to maintain continuity of nutrient intake after weaning.
11. Post-weaning strategies to maintain continuity of nutrient intake after weaning.
12. Individual pig care.
13. Improving rate of survivability of weaned pigs.
14. A practical approach to early intervention to reduce sow mortality.
15. Impact of essential fatty acids in lactation diets on sow and litter performance.

16. The common practice of split suckling. (Available in English and Spanish)
17. Cross-fostering practices explained. (Available in English and Spanish)
18. The Importance of Swine Herd Biosecurity (Available in English and Spanish)
19. Early Detection of Lameness (Available in English and Spanish)
20. Pig Movement Principles (Available in English and Spanish)
21. Early Identification of At-Risk Pigs in the Nursery (Available in English and Spanish)
22. Early Identification of Sick Pigs in the Finisher: Four Circles Approach (Available in English and Spanish)
23. Early Identification of At-Risk Sows in the Farrowing House (Available in English and Spanish)
24. Newborn Piglet Principles (Available in English and Spanish)
25. Ventilation Principles (Available in English and Spanish)
26. Basic Biology of Colostrum in Pigs.
27. A Practical Approach to Early Intervention to Reduce Sow Mortality: SOP (Available in English and Spanish)
28. Swine Euthanasia (Available in English and Spanish)
29. Best Practices for Moving and Sorting Pigs (Available in English and Spanish)
30. Evaluation of Split Suckling on Lifetime Growth Performance and Mortality

Interviews

1. Perineal scoring first clue to pelvic-organ prolapse in sow-mortality project. Jason Ross interviewed by Pig Health Today. <https://pighealthtoday.com/perineal-scoring-first-clue-to-pelvic-organ-prolapse-in-sow-mortality-project/>. April 26, 2019.
2. National Hog Farmer. Drivers of wean-to-finish mortality – Interview with Dr Edison Magalhaes. <https://www.nationalhogfarmer.com/farm-operations/drivers-wean-finish-mortality>. November 4, 2019.
3. Researchers tackle survivability issues head-on. Jason Ross interviewed by Pig Health Today. <https://pighealthtoday.com/researchers-tackle-survivability-issues-head-on/>. November 14, 2019.
4. Pig health today. Comprehensive Data-Driven Approach to Lower Wean-Finish Mortality with Dr. Edison de Souza Magalhaes. <https://pighealthtoday.com/mobile/article/?id=7585>. December 20, 2019.
5. AASV 2020: [Understanding pelvic organ prolapse and sow longevity](https://thepigsite.com/articles/aasv-understanding-pelvic-organ-prolapse-and-sow-longevity). Jason Ross interviewed by Sarah Mikesell. <https://thepigsite.com/articles/aasv-understanding-pelvic-organ-prolapse-and-sow-longevity>. March 24, 2020.

Podcasts

1. The PigX podcast was created where you can join extension specialist and swine industry experts as they engage in conversations aimed to help producers succeed in raising healthy pigs.
 1. Season 1. Ep. 1: PigX The Launch!
 - Featuring Dr. Chris Hostetler, Valerie Duttlinger, Dr. Jason Ross, Tim Kurt, & Dr. Joel DeRouchey
 2. Season 1. Ep. 2: Colostrum Intake and Management
 - Featuring Dr. Kara Stewart
 3. Season 1. Ep. 3: Getting Pigs Started in the Nursery
 - Featuring Dr. Tim Loula & Dr. Marlin Hoogland
 4. Season 1. Ep. 4: What Does the PRRS Virus and Biosecurity Have in Common?
 - Featuring Cesar Moura & Dr. Jeff Blythe

5. Season 1. Ep. 5: Body Condition Scores
 - Featuring Dr. Laura Greiner
6. Season 1. Ep. 6: The impact of weaning age
 - Featuring Dr. Mike Tokach & Dr. Adam Moeser
7. Season 1. Ep. 7: The People Factor
 - Featuring Dr. Ken Stalder & Valerie Duttlinger
8. Season 1. Ep. 8: 10 Steps to Reduce Wean-to-Finish Mortality
 - Featuring Dr. Chris Sievers & Dr. Ryan Strobel
9. Season 1. Ep. 9: 10 Steps to Reduce Wean-to-Finish Mortality Pt. 2
 - Featuring Dr. Chris Sievers & Dr. Ryan Strobel
10. Season 1. Ep. 10: The Economics Behind the Swine Industry
 - Featuring Dr. Derald Holtkamp & Dr. Lee Schulz
11. Season 1. Ep. 11: Overall Sow Longevity
 - Featuring Dr. Mark Wilson
12. Season 1. Ep. 12: Setting Up for Success
 - Featuring Kendall Weger
13. Season 2. Ep. 1: Mortality Economics
 - Featuring Dr. Caleb Shull
14. Season 2. Ep. 2: The Importance of Ventilation
 - Featuring Dr. Brett Ramirez & Fernando Gomez
15. Season 2. Ep. 3: Transport Losses
 - Featuring Dr. Matt Ritter & Dr. Anna Johnson
16. Season 2. Ep. 4: PRRS
 - Featuring Dr. Daniel Linhares & Dr. Paul Yeske
17. Season 2. Ep. 5: Stocking Density & General Mortality
 - Featuring Dr. Chris Rademacher & Dr. Steve Pollmann
18. Season 2. Ep. 6: Stocking Density & General Mortality Part 2
 - Featuring Dr. Chris Rademacher & Dr. Steve Pollmann
19. Season 2. Ep. 7: Swine Survivability Conference Recap
 - Featuring Dr. Joel DeRouchey & Dr. Jason Ross
20. Season 2. Ep. 8: Conference Recaps
 - Featuring Dr. Noel Williams
21. Season 2. Ep. 9: Survivability and the Sow
 - Featuring Dr. Ron Ketchum
22. Season 2. Ep. 10: All About the People
 - Featuring Dr. Sarah Probst-Miller & Valerie Duttlinger
23. Season 2. Ep. 11: Industry Changes, the Post-Wean Transition, and More
 - Featuring Dr. Jim Pillen & Dr. Deb Murray
24. Season 2. Ep. 12: Sustainability in Pork Production
 - Featuring Dr. Brett Kaysen & Dr. Justin Ransom
25. Season 3. Ep. 1: Sow Farm Management
 - Featuring Chris Blevins & Lance Dunbar
26. Season 3. Ep. 2: The Definition and Purpose of Staged Loading
 - Featuring Dr. Derald Holtkamp & Dr. Chris Rademacher
27. Season 3. Ep. 3: Genetic Resilience in Swine
 - Featuring Dr. Jack Dekkers
28. Season 3. Ep. 4: Individual Sow Care
 - Featuring Dr. Chris Rademacher, Dr. Justin Brown, & Dr. Pete Thomas

29. Season 3. Ep. 5: Actinobacillus Pleuropneumoniae (APP) Outbreaks and Prevention
 - Featuring Dr. Derald Holtkamp & Dr. Marcelo Almeida
30. Season 3. Ep. 6: Biocontainment in Grow Finish Hogs
 - Featuring Dr. Paul Yeske & Dr. Giovanni Trevisan
31. Season 3. Ep. 7: Engaging Frontline Employees
 - Featuring Kent Mogler
32. Season 3. Ep. 8: Survivability & Stress Alleviation
 - Featuring Dr. Christine Mainquist-Whigham
33. Season 3. Ep. 9: Research on Heat Stress
 - Featuring Dr. Josh Selsby & Dr. Kara Stewart
34. Season 3. Ep. 10: Gender Effects on Heat Stress
 - Featuring Dr. Josh Selsby
35. Season 3. Ep. 11: Ventilation Related to Heat Stress
 - Featuring Dr. Brett Ramirez & Matt Romoser
36. Season 3. Ep. 12: In Utero Heat Stress
 - Featuring Dr. Jason Ross & Dr. Lance Baumgard
37. Season 4. Ep. 1: PROSPER Grant
 - Featuring Dr. Daniel Linhares & Dr. Edison Magalhaes
38. Season 4. Ep. 2: Gilt Eligibility and Sow Longevity
 - Featuring Jennifer Patterson & Matt Romoser
39. Season 4. Ep. 3: Domestic and International Sustainability
 - Featuring Shane McAuliffe & Tom Battagliese
40. Season 4. Ep. 4: Gilt Nutrition
 - Featuring Matt Romoser & Dr. Spenser Becker
41. Season 4. Ep. 5: Biosecurity and Foreign Animal Disease Overview
 - Featuring Dr. Jordan Graham & Dr. Dusty Oedekoven
42. Season 4. Ep. 6: PRRS Management Program
 - Featuring Dr. Daniel Linhares & Dr. Chris Rademacher
43. Season 4. Ep. 7: Water Biology vs. Water Quality
 - Featuring Dr. Gabi Doughan & Becca Walthart
44. Season 4. Ep. 8: Gilt Selection & Sow Longevity
 - Featuring Matt Romoser & Derek Henningsen
45. Season 4. Ep. 9: Porcine Sapovirus
 - Featuring Dr. Chris Rademacher & Dr. Tom Petznick
46. Season 4. Ep. 10: Swine Disease Reporting System
 - Featuring Dr. Giovanni Trevisan, Dr. Daniel Linhares, & Dr. Guilherme Cezar
47. Season 4. Ep. 11: The Future of Animal Agriculture & Canadian Pork Production Systems
 - Featuring Jack Bobo and Dan Bussi res
48. Season 4. Ep. 12: Standardized Outbreak Investigation Program
 - Featuring Dr. Kate Dion and Dr. Derald Holtkamp
49. Season 5. Ep. 1: Iowa Swine Day Event
 - Featuring Janae Metzger & Stacie Matchan
50. Season 5. Ep. 2: Swine Bone Mineralization
 - Featuring Dr. Jordan Gebhardt
51. Season 5. Ep. 3: Mineral Requirements for Gestating and Lactating Sows
 - Featuring Dr. Jordan Gebhardt and Larissa Becker

52. Season 5. Ep. 4: Upcoming Considerations for Agricultural Visas
 - Featuring Rachel Beardsley
53. Season 5. Ep. 5: Exploring Swine Health Research
 - Featuring Dr. Marcelo Almeida
54. Season 5. Ep. 6: Newly Built National Bio and Agro-Defense Facility (NBAF) Aims to Protect U.S. Farms from Diseases
 - Featuring Dr. Chad Mire and Dr. Robin Holland
55. Season 5 Ep. 7: Pelvic Organ Prolapse (POP) – Understanding the Problem and Solutions for Producers and Breeders
 - Featuring Dr. Jack Dekkers and Dr. Jenelle Dunkelberger
56. Season 5 Ep. 8: Technology Insights and Considerations for Producers
 - Featuring Dr. Isabella Condotta
57. Season 5 Ep. 9: Utilizing on Farm Data to Determine Herd Health Status
 - Featuring Dr. Gustavo Silva and Dr. Mafalda Mil-Homens
58. Season 5 Ep. 10: The Value and Importance of Market Haul Sanitation
 - Featuring Dr. Edison Magalhaes, Dr. Pete Thomas, and Dr. Tyler Bauman
59. Niche Production Mini Series, Episode 1: Investigating Gaps Small Producers Have in Resources
 - Featuring Casey Zangaro
60. Niche Production Mini Series, Episode 2: Energy vs Fiber, Does Form Matter?
 - Featuring Dr. Lee Johnston
61. Niche Production Mini Series, Episode 3: Understanding the Importance of Protein in Pigs
 - Featuring Dr. Laura Greiner
62. Niche Production Mini Series, Episode 4: Direct Marketing in Swine
 - Featuring Dr. Colt Knight
63. Season 5 Ep. 11: New Split Suckling Research Reveals Surprises
 - Featuring Dr. Ashley Hartman and Mikayla Spinler
64. Season 6 Ep. 1: The Pig Livability Project: Past, Present, and Future
 - Featuring Dr. Joel DeRouchey and Dr. David Rosero
65. Season 6 Ep. 2: Functional Teat Count and Its Impact on Swine Performance
 - Featuring Abigail Jenkins and Dr. Joel DeRouchey
66. Season 6 Ep. 3: Manure Handling Connections Between PRRSV and PEDV
 - Featuring Dr. Ana Paula Serafini Poeta Silva

One-page podcast summaries are generated for all PigX podcast episodes. Seasons 1, 2, 3 & 4 are complete and posted on the survivability webpage.

Faculty or students on the project have contributed to external podcasts that are also distributed through various venues.

- a. SwineIt podcast: Wean-to-finish mortality: infectious causes – Dr. Jordan Gebhardt (May 21, 2020).
- b. SwineIt podcast: Wean-to-finish mortality: non-infectious causes – Dr. Jordan Gebhardt (Mar 9, 2020).
- c. SwineIt podcast: Starting pigs off right and other methods of decreasing pig herd mortality – Dr. Chris Rademacher (June 14, 2022).
- d. SwineIt podcast: First two lameness studies – Spenser Becker (February 1, 2022).
- e. Feedstuffs in Focus podcast: Sow pelvic organ prolapse appears to have genetic, environmental basis – Vishesh Bhatia and Dr. Jack Dekkers (June 2, 2023).

Decision Tools

1. Euken, R. and L. Schulz. 2021. Pig Survivability Project: Wean-to-Finish Mortality Economic Modeling *Ag Decision Maker B1-78*
2. Euken, R. and L. Schulz. 2022. Pig Survivability Project: Breed-to-Wean Mortality Economic Modeling *Ag Decision Maker B1-79*