Publications

*Peer reviewed*

1. Abbas, W., J.T. Howard, H.A. Paz, K.E. Hales, J.E. Wells, L.A. Kuehn, G.E. Erickson, M.L. Spangler, and S.C. Fernando (2020). Influence of host genetics in shaping the rumen bacterial community in beef cattle. Sci Rep. 10(1):15101. doi: 10.1038/s41598-020-72011-9.
2. Abrams, A.N., T.G. McDaneld, J.W. Keele, C.G. Chitko-McKown, L.A. Kuehn, and M.G. Gonda (2021). Evaluating Accuracy of DNA Pool Construction Based on White Blood Cell Counts. Front Genet. 12:635846. doi: 10.3389/fgene.2021.635846.
3. Baller, J.L., S.D. Kachman, L.A. Kuehn, and M.L. Spangler (2020). Genomic prediction using pooled data in a single-step genomic best linear unbiased prediction framework. J Anim Sci. 98(6):skaa184. doi: 10.1093/jas/skaa184.
4. Bennett, G.L., R.M. Thallman, W.M. Snelling, J.W. Keele, H.C. Freetly, and L.A. Kuehn (2021). Genetic changes in beef cow traits following selection for calving ease. Transl Anim Sci. 5(1):txab009. doi: 10.1093/tas/txab009.
5. Bermann, M., A. Legarra, Y. Masuda, D.A.L. Lourenco, and I. Misztal (2020). Validation of single-step GBLUP genomic predictions from threshold models using the linear regression (LR) method: an application in chicken mortality. J. Anim. Breed. Genet. doi: 10.1111/jbg.12507.
6. Bermann, M., D. Lourenco, and I. Misztal (2020) Technical note: Automatic scaling in single-step GBLUP. J. Dairy Sci. doi: 10.3168/jds.2020-18969.
7. Butler, M., J. Bormann, R.L. Weaber, D. Grieger, and M.M. Rolf (2020). Beef Bull Fertility: A Review. Translational Animal Science 4(1):1-19. doi: 10.1093/tas/txz174.
8. Cesarani, A., G. Gaspa, Y. Masuda, L. Degano, D. Vicario, D.A.L. Lourenco, and N.P.P. Macciotta (2020). Genomic analysis of two functional traits in Italian Simmental cattle: calving interval and lactation persistency. J. Dairy Sci. 103:5227-5233. doi: 10.3168/jds.2019-17421.
9. Cesarani, A., J. Hidalgo, A. Garcia, L. Degano, D. Vicario, Y. Masuda, I. Misztal, and D. Lourenco (2020). Beef trait genetic parameters based on old and recent data and its implications for genomic predictions in Italian Simmental cattle. J. Anim. Sci. 98:1-8. doi: 10.1093/jas/skaa242.
10. Delgadillo-Liberona, J.S., J.M. Langdon, A.D. Herring, H.D. Blackburn, S.E. Speidel, S. Sanders and D.G. Riley (2020). Random regression of Hereford percentage intramuscular fat on geographical coordinates. J. Anim. Sci. 98:1-10. doi:10.1093/jas/skz359.
11. Freetly, H.C., L.A. Kuehn, R.M. Thallman, and W.M. Snelling (2020). Heritability and genetic correlations of feed intake, body weight gain, residual gain, and residual feed intake of beef cattle as heifers and cows. J Anim Sci. 98(1):skz394. doi: 10.1093/jas/skz394.
12. Garcia, A.L.S., Y. Masuda, S. Tsuruta, S. Miller, I. Misztal, and D. Lourenco (2020). Indirect predictions with a large number of genotyped animals using the algorithm for proven and young. J. Anim. Sci. 98:1-9. doi: 10.1093/jas/skaa154.
13. Garcia-Baccino, C., D. Lourenco, S. Miller, R. J.C. Cantet., and Z.G. Vitezica (2020). Estimating dominance genetic variances for growth traits in American Angus cattle using genomic models. J. Anim. Sci. 98:skz384. doi: 10.1093/jas/skz384.
14. Gualdron Duarte, J.L., A.S. Gori, X. Hubin, D. Lourenco, C. Charlier, I. Misztal, and T. Druet. 2020. Performances of Adaptive MultiBLUP, Bayesian regressions, and weighted GBLUP approaches for genomic predictions in Belgian Blue Beef cattle. BMC Genomics 21:545. doi: 10.1186/s12864-020-06921-3.
15. Heiber, J.J., R. Endecott, J. Boles, and J. Thompson (2021). Identification of genetic markers and QTL for carcass quality traits within the American Simmental Association Carcass Merit program. Animals 11:471. doi: 10.3390/ani11020471.
16. Junqueira, V.S., P.S. Lopes, D. Lourenco, F. F. Silva, and F.F. Cardoso (2020). Applying the metafounders approach for genomic evaluation in a multibreed beef cattle population. Front. Genet. 11:556399. doi: 10.3389/fgene.2020.556399.
17. Lourenco, D., A. Legarra, S. Tsuruta, Y. Masuda, I. Aguilar, and I. Misztal (2020). Single-Step Genomic Evaluations from Theory to Practice: Using SNP Chips and Sequence Data in BLUPF90. Genes 11:790. doi: 10.3390/genes11070790.
18. McWhorter, T.M., J.L. Hutchison, H.D. Norman, J.B. Cole, G.C. Fok, D.A.L. Lourenco, and P.M. VanRaden (2020). Investigating conception rate for beef service sires bred to dairy cows and heifers. J. Dairy Sci. 103:10374-10382. doi: 10.3168/jds.2020-18399.
19. Misztal, I., D. Lourenco, and A. Legarra (2020). Current status of genomic evaluation. J. Anim. Sci. 98:skaa101. doi: 10.1093/jas/skaa101.
20. Misztal, I., S. Tsuruta, I. Pocrnic, and D.A.L. Lourenco (2020). Core-dependent changes in genomic predictions using the algorithm for proven and young in single-step GBLUP. J. Anim. Sci. doi: 10.1093/jas/skaa374.
21. Pierce, C.F., S.E. Speidel, S.J. Coleman, R.M. Enns, D.W. Bailey, J.F. Medrano, A. Canovas, P.J. Meiman, L.D. Howery, W.F. Mandeville and M.G. Thomas (2020). Genome-Wide association studies of beef cow terrain-use traits using Bayesian Multiple-SNP regression. Livest. Sci. 232. doi:10.1016/j.livsci.2019.103900.
22. Qu, J., S. Kachman, R. Fernando, D. Garrick, and H. Cheng (2020). Exact distribution of linkage disequilibrium in the presence of mutation, selection or minor allele frequency filtering. Front. Genet. 11:18. doi: 10.3389/fgene.2020.00362.
23. Saad, H.M., M.G. Thomas, S.E. Speidel, R.K. Peel, W.M. Frasier, R.M. Enns (2020). Differential response from selection for low birth weight versus high calving ease in American Simmental beef cattle. J. Anim. Sci. 98:1-10. doi:10.1093/jas/skaa162.
24. Snelling, W.M., J.L. Hoff, J.H. Li, L.A. Kuehn, B.N. Keel, A.K. Lindholm-Perry, and J.K. Pickrell (2020). Assessment of Imputation from Low-Pass Sequencing to Predict Merit of Beef Steers. Genes (Basel) 11(11):1312. doi: 10.3390/genes11111312.
25. Speidel, S.E., M.G. Thomas, T.N. Holt and R.M. Enns (2020). Evaluation of the sensitivity of pulmonary arterial pressure to elevation using a reaction norm model in Angus cattle. J. Anim. Sci. 98:1-9. doi:10.1093/jas/skaa129.
26. Tsuruta, S., T.J. Lawlor, D.A.L. Lourenco, and I. Misztal (2020). Bias in genomic predictions by mating practices for linear type traits in a large-scale genomic evaluation. J. Dairy Sci. doi: 10.3168/jds.2020-18668.
27. Wang, Z., D. Chapman, G. Morota, and H. Cheng (2020). A multiple-trait Bayesian variable selection regression method for integrating phenotypic causal networks in genome-wide association studies. G3: Genes, Genomes, Genetics 10(12):4439-4448. doi: 10.1534/g3.120.401618.
28. Zamorano-Algandar, R., M.A. Sanchez-Castro, A. Hernandez-Cordero, R.M. Enns, S.E. Speidel, M.G. Thomas, J.F. Medrano, G. Rincon, J.C. Leyva-Corona, G. Luna-Nevarez, J.R. Reyna-Granados, P. Luna-Nevarez (2020). Molecular breeding value estimation from candidate genes associated with reproductive traits in lactating Holstein cows managed in warm environmental conditions. Livest. Sci. *Submitted in Review*.
29. Zhao, T., R. Fernando, D. Garrick, and H. Cheng (2020). Fast parallelized sampling of Bayesian regression models for whole-genome prediction. Genetics Selection Evolution 52(1):111. doi: 10.1186/s12711-020-00533-x.

*Abstracts and proceedings*

1. Baller, J.L., S.D. Kachman, L.A. Kuehn, and M.L. Spangler. 2020. Using pooled data for single-step genomic prediction: Impact of within-pool variance and size. J. Anim. Sci. 98: Suppl. 4.
2. Bartenslager, A., N. Aluthge, J. Loy, M. Spangler, and S. Fernando. 2020. Resilience of the ocular microbiome in beef calves. J. Anim. Sci. 98: Suppl. 3.
3. Bouffiou, J., J. Boles, and J. Thompson. 2020. Investigating the relationship between temperament and performance traits in feedlot cattle. J. Anim. Sci. 98: Suppl. 4.
4. Briggs, E.A., S.E. Speidel, R.M. Enns, M.G. Thomas, and T.N. Holt. 2020. Evaluation of the genetic relationship amongst high elevation pulmonary arterial pressure, feedlot and carcass performance traits. J. Anim. Sci. 98:Suppl. 4.
5. Briggs, E.A., R.M. Enns, M.G. Thomas, and S.E. Speidel. 2020. Evaluation of the genetic relationship between pulmonary arterial pressure with feedlot and carcass performance. Transl. Anim. Sci. 4(Suppl. 1):S98-S102.
6. Bullock, K.D., K.R. VanValin, J.W. Lehmkuhler, L.H. Anderson, B.R. Crites, K.M. Laurent, M.L. Spangler, and R.L. Weaber. 2020. Effectiveness of an Educational Program on Beef Bull Selection that Incorporates Classroom Instruction and a Mock Auction. J. Anim. Sci. 98: Suppl. 4.
7. Butler, M., J.M. Bormann, R.L. Weaber, D.M. Grieger, and M.M. Rolf. Estimation of the genetic parameters of beef bull semen attributes. Midwest Society of Animal Science. Omaha, NE.
8. Crawford, N.F., K.J. Jennings, A. Canovas, J.F. Medrano, A. Islas-Trejo, R.D. Brown, S.J. Coleman, S.E. Speidel, R.M. Enns, K.R. Stenmark, and M.G. Thomas. 2020. Genes regulating calcium availability and utilization in Angus steers may be useful in identifying cattle with reduced susceptibility to pulmonary hypertension in high altitude beef production systems. Plant and Animal Genome XXVIII, San Diego, CA.
9. Garcia, A., A. Legarra, S. Miller, S. Tsuruta, I. Misztal, and D. Lourenco. 2020. Accuracy of indirect predictions for large datasets based on prediction error covariance of SNP effects from single-step GBLUP. American Society of Animal Science Annual Meeting, (virtual).
10. Garcia, A., I. Aguilar, A. Legarra, S. Miller, S. Tsuruta, I. Misztal, and D. Lourenco. 2020. Accuracy of indirect predictions based on prediction error covariance of SNP effects from single-step GBLUP. Plant and Animal Genome XXVIII Conference, San Diego, CA.
11. Gonzalez-Murray, R.A., M.A. Sanchez-Castro, M.G. Thomas, S.E. Speidel, and R.M. Enns. 2020. Heterosis and its potential influence on pulmonary arterial pressure in beef cattle. J. Anim. Sci. 98:Suppl. 4.
12. Gonzalez-Murray, R.A., M.A. Sanchez-Castro, M.G. Thomas, S.E. Speidel, and R.M. Enns. 2020. Heterosis and its potential influence on pulmonary arterial pressure on beef cattle. Transl. Anim. Sci. 4(Suppl. 1):S118-S121.
13. Heffernan, K.R., S.E. Speidel, M.G. Thomas, R.M. Enns, and T.N. Holt. 2020. Phenotypic relationships between heart score and feed efficiency, carcass and pulmonary arterial pressure traits. J. Anim. Sci. 98:Suppl. 4.
14. Heffernan, K.R., M.G. Thomas, R.M. Enns, and S.E. Speidel. 2020. Phenotypic relationships between heart score and feed efficiency, carcass, and pulmonary arterial pressure traits. Transl. Anim. Sci. 4(Suppl. 1):S103-107.
15. Hieber, J., J. Dafoe, C. Parsons, D.C. Anderson, D. Boss, J. Boles, and J. Thompson. 2020. Inbreeding levels of the Line 1 and Line 4 Hereford cattle populations. J. Anim. Sci. 98: Suppl. 4.
16. Hidalgo, J., D. Lourenco, S. Tsuruta, S. Miller, A. Garcia, Y. Masuda, and I. Misztal. 2020. Changes in genomic predictions when new data is included. American Society of Animal Science Annual Meeting, (virtual).
17. Jacobs, D., C.E. Silvera-Rojas, J.M. Bormann, T.A. Gipson, A.L. Goetsch, R.L. Weaber, and M.M. Rolf. 2020. Genetic parameters and quantitative trait loci for heat stress related traits in sheep. Midwest Society of Animal Science. Omaha, NE.
18. Jang, S., A. Garcia, S. Lee, S. Tsuruta, and D. Lourenco. 2020. Genomic prediction for marbling score in Hanwoo cattle using sequence data. American Society of Animal Science Annual Meeting, (virtual).
19. Kluska, S., Y. Masuda, F. Baldi, J.P. Eller, J.B.S. Ferraz, and D. Lourenco. 2020. Genomic predictions for Montana composite cattle using Metafounders. Plant and Animal Genome XXVIII Conference, San Diego, CA.
20. Krafsur, G., R. Brown, M.G. Thomas, M.M. Culbertson, T.N. Holt, S.E. Speidel, R.M. Enns, K. Stenmark, M. Li, S. Riddle, and R. Bowen. 2020. Metabolism and inflammation predict ardiopulmonary disease outcomes in fattening beef cattle: histopathology. CRWAD. 284.
21. Lourenco, D. 2020. Updates on the use of genomic selection for beef cattle. Argentinian Society of Genetics Annual Meeting, (virtual).
22. Lourenco, D., I. Aguilar, A. Legarra, A. Garcia, Y. Masuda, S. Tsuruta, and I. Misztal. 2020. Accuracy of indirect predictions based on prediction error covariance from single-step genomic BLUP. American Dairy Science Association Annual Meeting, (virtual).
23. Lourenco, D., S. Tsuruta, B. Bosworth, G. Waldbieser, Y. Palti, and I. Misztal. 2020. Genomic selection: from SNP chips to whole-genome sequence data. Plant and Animal Genome XXVIII Conference, San Diego, CA.
24. Lourenco, D., S. Tsuruta, Y. Masuda, and I. Misztal. 2020. Genetic and Genomic Analysis in Livestock with Increasing Datasets. American Society of Animal Science Annual Meeting, (virtual).
25. Lourenco, D., S. Tsuruta, J. Hidalgo, and I. Misztal. 2020. Increased fluctuations of genetic evaluations with genomic information. American Society of Animal Science Annual Meeting, (virtual).
26. Lourenco, D., S. Tsuruta, S. Jang, B. Fragomeni, and I. Misztal. 2020. When is sequence data going to help increasing accuracy of genomic predictions in livestock? 71st EAAP – European Association for Animal Production, (virtual).
27. McWhorter, T.M., J.L. Hutchison, H.D. Norman, J.B. Cole, G.C. Fok, D.A.L. Lourenco, and P.M. VanRaden. 2020. Investigating conception rate for beef service sires bred to dairy cows. American Dairy Science Association Annual Meeting, (virtual).
28. Misztal, I., I. Pocrnic, M. Perez-Enciso, and D. Lourenco. 2020. Understanding impact of causative SNP on genomic predictions. 71st EAAP – European Association for Animal Production, (virtual).
29. Misztal, I., I. Pocrnic, M. Perez-Enciso, and D.A.L. Lourenco. 2020. Profiles of causative SNP in a genome-wide association study. American Dairy Science Association Annual Meeting, (virtual).
30. Noland, R., W. Shaffer, C.M. Ahlberg, K. Allwardt, A. Broocks, K. Bruno, L. McPhillips, A. Taylor, C.R. Krehbiel, C.J. Richards, U. DeSilva, D.L. CanOverbeke, R.G. Mateescu, L.A. Kuehn, R.L. Weaber, J.M. Bormann, and M.M. Rolf. 2020. Genome-wide association analysis for respiration rate in beef cattle. ASI Undergraduate Research Forum. Manhattan, KS.
31. Ribeiro, A., B.L. Golden, and M.L. Spangler. 2020. President Oral Presentation Pick: Using Deep Neural Networks to determine birth weight data quality for genetic evaluations in beef cattle. J. Anim. Sci. 98: Suppl. 4.
32. Sanchez-Castro, M.A., M.G. Thomas, R.M. Enns, and S.E. Speidel. 2020. Genetic prediction for first-service conception rate in Angus heifers using a random regression model. J. Anim. Sci. 98:Suppl. 4.
33. Sanchez-Castro, M.A., M.G. Thomas, R.M. Enns, and S.E. Speidel. 2020. Genetic prediction for first-service conception rate in Angus heifers using a random regression model. Transl. Anim. Sci. 4(Suppl. 1):S43-47.
34. Thomas, M.G., J. Dillon, D. Bailey, S.E. Speidel, and R.M. Enns. 2020. Grazing distribution of beef cattle: acronyms of technology and spatial measures. J. Anim. Sci. 98:Suppl. 3.
35. Thomas, M.G., J.A. Dillon, D.W. Bailey, C.F. Pierce, S.E. Speidel, and R.M. Enns. 2020. Grazing distribution of beef cattle: acronyms and spatial measures. Proc. Mid-West Mtg. Am. Soc. Anim. Sci., Omaha, NE.
36. Thomas, M.G., T.N. Holt, R.M. Enns and S.E. Speidel. 2020. New research probes into feedlot cattle heart failure. Progressive Cattlemen. pp. 42-43.
37. Upperman, L.R., L.A. Kuehn, and M.L. Spangler. 2020. Genetic parameter estimates for days on feed, age at slaughter, and carcass traits in a multibreed beef cattle population. J. Anim. Sci. 98: Suppl. 4.
38. Upshaw, K. A.J. Tarpoff, M.D. MacNeil, R.L. Weaber, J.M. Bormann, and M.M. Rolf. 2020. Detection of Vertical Fiber Hide Defect in Beef Cattle. K-State Grad Forum. Manhattan, KS. (abstract submitted, but event ultimately cancelled due to COVID).
39. Zhai, C., R.J. Delmore, I. Geornaras, S.E. Speidel, T.N. Holt, M.G. Thomas, R.M. Enns, and M.N. Nair. 2020. Pulmonary arterial pressure in cattle influences beef color during retail display. J. Anim. Sci. 98:Suppl. 4.
40. Zimprich, T.R., S.E. Speidel, D. Schafer, B. LaShell, T.N. Holt, R.M. Enns, S. Cunningham, and M.G. Thomas. 2020. Repeated measures of PAP at different elevations in beef bulls in Colorado. J. Anim. Sci. 98:Suppl. 4.
41. Zimprich, T.R., S.E. Speidel, D.W. Schafer, B. Lashell, T.N. Holt, R.M. Enns, S.E. Cunningham, and M.G. Thomas. 2020. Repeated measures of PAP at different elevations in beef bulls in Colorado. Transl. Anim. Sci. 4(Suppl. 1):S113-S117.

*Presentations*

1. Briggs et al. Genetic Relationships Between High-elevation Pulmonary Arterial Pressure and Feedlot Growth, Intake and Carcass Traits. Beef Improvement Federation Annual Research Symposium, (virtual), 2020.
2. Enns et al., Cattle HAD, FHD and PAP: understanding pulmonary hypertension in cattle. National Cattlemen’s Beef Association webinar on health issues in Mid-Late fed cattle. 2020.
3. Lourenco, D. Genomic evaluations: easier said than done. Iowa State University (virtual), 2020.
4. Lourenco, D. Tools and methods for genomic prediction in livestock and research/developments needed. Purdue University (virtual), 2020.
5. Lourenco, D. Updates on the use of genomic selection for beef cattle. SAG, Argentina (virtual), 2020.
6. Lourenco, D. Genetic and Genomic Analysis in Livestock with Increasing Datasets. ASAS (virtual), 2020.
7. Lourenco, D. Increased fluctuations of genetic evaluations with genomic information. ASAS (virtual), 2020.
8. Lourenco, D. Increasing accuracy of predictions: from SNP chips to sequence data. BIF Conference (virtual), 2020.
9. Lourenco, D. Accuracy or accuracy? University of Zagreb, Zagreb, Croatia (virtual), 2020.
10. Lourenco, D. Developing genomic strategies for the livestock industries: all implementations are challenging. UNAM, Mexico City, Mexico (virtual), 2020.
11. Lourenco, D. Understanding Animal Breeding and Genetics. UFMS, Campo Grande, Brazil (virtual), 2020.
12. Lourenco, D. 30andMoo: How DNA testing works in cattle and other species. UGA, Athens, GA, 2020.
13. McClain, K et al. Different breeds of beef cattle and their effect on water intake. KRSE Summer Research Fellows (virtual), 2020.
14. Misztal, I. Genomic selection across species at UGA. INIA, Madrid, Spain, 2020.
15. Misztal, I. Genomic selection across species at UGA. University of Zaragoza, Spain, 2020.
16. Misztal, I. Genomic selection across species at UGA. IRTA, Caldes de Montbui, Spain, 2020.
17. Misztal, I. How to estimate genetic parameters in genomic era. ASAS (virtual), 2020.
18. Misztal, I. Genomic selection across species at UGA. Taipei, Taiwan (virtual), 2020.
19. Rolf, M.M. Heat tolerance and adaptation research at KSU. 2020 Texas A&M Short Course (virtual), 2020.
20. Spangler, M.L. Genetic considerations for the cowherd, Nebraska Ranch Practicum (via webinar), North Platte, NE, 2020.
21. Spangler, M.L. Advances in genetic prediction and the potential benefits to non-geneticists, Panhandle Research and Extension Center seminar, Scottsbluff, NE, 2020.
22. Spangler, M.L., and B. Weaber. Application of advanced genetic technology in beef cattle. King Ranch Institute for Ranch Management, Kingsville, TX, 2020.
23. Spangler, M.L. Making the best use of current genetic selection tools, NCBA webinar, 2020.
24. Spangler, M.L. Keeping your genetic decisions between the ditches: Breeding objectives, Beef Profit Tips Workshop, West Point, NE, 2020.
25. Spangler, M.L. A discussion on selection indexes, American Hereford Association Board of Directors Meeting (virtual), 2020.
26. Spangler, M.L. iGENEC: A tool for web-based sire selection decisions, Beef Improvement Federation Annual Convention (virtual), 2020.
27. Spangler, M.L. A discussion on genetic evaluations and selection, Allied Genetic Resources member meeting, Lexington, NE (participated virtually), 2020.
28. Spangler, M.L. Cattle breeds and selection basics. On The Farm Genetics and Heredity Professional Development for High School Teachers (Livestream), 2020.
29. Spangler, M.L. Advancing beef genetics—Genomics, AI, and more. UNL Extension Ag. Technology Issue Team Webinar Series, 2020.
30. Spangler, M.L. Making the sire selection process simpler: A web-based decision support tool (iGENDEC). National Beef Cattle Evaluation Consortium Brown Bagger Webinar Series, 2020.
31. Spangler, M.L. The importance of phenotypes in a genomic world. American Wagyu Association Convention (virtual), 2020.
32. Speidel et al. Genetic Improvement Research at Colorado State University. Mid-Feeding Period Morbidity and Late-Feeding Period Mortality Challenges in High Performing Cattle, International Consortium for Antimicrobial Stewardship in Agriculture. 2020.
33. Speidel et al. Feedlot Heart Disease Research Results: CSU, ABS and Cactus Feeders, online Feedlot Heart Disease Research Update. 2020/
34. Thomas et al. Development of PAP EPD Progress Update. International Genetic Solutions, Round Table. 2020.
35. Thomas et al. Heart failure in beef cattle-PAP EPD. International Genetic Solutions booth seminar at the National Cattlemen’s Beef Association Annual Meeting. 2020.
36. Weaber, R.L. Beef cattle selection tools: EPDs and beyond. Missouri Veterinary Medical Association Convention, Columbia, MO. 2020.
37. Weaber, R.L. Beef sire and replacement female selection strategies. Missouri Veterinary Medical Association Convention, Columbia, MO. 2020.

*Technical reports*

1. Enns, R.M., S.E. Speidel, M.G. Thomas. 2020. Report to ABS Global. Results of pulmonary arterial pressure tests on progeny of ABS Global Sires. 8-pages.
2. Saad, H.M., S.E. Speidel and R.M. Enns. 2020. Report to the American Gelbvieh Association. Results of analysis for a prototype scrotal circumference genetic evaluation. 7-pages.
3. Speidel, S.E., and R.M. Enns. 2020. Report to Leachman Cattle of Colorado. Updated results from the analysis of Random Regression Stayability.
4. Speidel, S.E., M.G. Thomas, and R.M. Enns. 2020. AES Progress Report: National Beef Cattle Evaluation progress report.
5. Thomas, M.G., S.E. Speidel, and R.M. Enns. 2020. AES Progress Report: Livestock Management Systems Progress Report.

*Book chapters*

1. Rolf, M.M., and J.M. Bormann. 2021. Data Collection. In: K.D. Bullock (ed.) Beef Sire Selection Manual. Third Edition. National Beef Cattle Evaluation Consortium. Lexington, KY.
2. Upshaw, K., M. Butler, J. Henderson, W. Shaffer, and M.M. Rolf. 2021. Utilization of genomic testing for the selection of desirable traits in cattle. Pages Unknown. In: Bovine Reproduction. Edited by Richard Hopper. Wiley.
3. Weaber, R.L. 2020. Breed and composite breed selection. In: K.D. Bullock (ed.) Beef Sire Selection Manual. Third Edition. National Beef Cattle Evaluation Consortium. Lexington, KY.
4. Weaber, R.L. 2020. Crossbreeding for commercial beef production. In: K.D. Bullock (ed.) Beef Sire Selection Manual Third Edition. National Beef Cattle Evaluation Consortium. Lexington, KY.

*Extension*

1. Brown Bagger Webinar. National Beef Cattle Evaluation Consortium. Hosted by: R. L. Weaber, M. L. Spangler and K. D. Bullock. Wednesdays in October, 2020. (https://www.nbcec.org/professionals/brownbag.html)
2. Weaber, R.L. and M.L. Spangler. Application of advanced genetic technology in beef cattle. King Ranch Institute of Ranch Management. Kingsville, TX. February 21-22, 2020.