

Publications

NCERA-225 Participants are in Bold.

Peer Reviewed Articles

1. Abdollahi-Arpanahi, R., **D. Lourenco**, and **I. Misztal**. 2021. Detecting effective starting point of genomic selection by divergent trends from BLUP and ssGBLUP in pigs, beef cattle, and broilers. *J. Anim. Sci.* 99(9): skab243. doi: 10.1093/jas/skab243.
2. Abdollahi-Arpanahi, R., **D. Lourenco**, A. Legarra, and **I. Misztal**. 2021. Dissecting the genetic trends to understand the breeding practices in livestock: A maternal pig line example. *Genet. Sel. Evol.* 53: 89. doi: 10.1186/s12711-021-00683-6.
3. Al-Tobasei, R., A. Ali, A. L. S. Garcia, **D. Lourenco**, T. Leeds, and M. Salem. 2021. Genomic predictions for fillet yield and firmness in rainbow trout using reduced-density SNP panels. *BMC Genomics* 22: 92. doi: 10.1186/s12864-021-07404-9.
4. Angulo-Valenzuela, N. I., **M. G. Thomas**, D. G. Riley, J. F. Medrano, and P. Luna-Nevarez. 2021. A SNP within the *PMCH* gene as molecular marker associated to fertility traits in Angus and Brangus heifers raised in desert environment (short communication). *Trop. Anim. Health Prod.* 53: 355. doi: 10.1007/s11250-021-02794-0.
5. Araujo, A. C., P. L. S. Carneiro, H. R. Oliveira, F. S. Schenkel, R. Veroneze, **D. A. L. Lourenco**, and L. F. Brito. 2021. A comprehensive comparison of haplotype-based single-step genomic predictions in livestock populations with different genetic diversity levels: a simulation study. *Front. Genet.* 12: 729867. doi: 10.3389/fgene.2021.729867.
6. Bartenslager, A. C., N. D. Aluthge, J. D. Loy, M. M. Hille, **M. L. Spangler**, and S. Fernando. 2021. Longitudinal assessment of the bovine ocular bacterial community dynamics in calves. *Animal Microbiome* 3: 16. doi: 10.1186/s42523-021-00079-3.
7. Bermann, M., A. Legarra, **Y. Masuda**, **D. A. L. Lourenco**, **I. Misztal**. 2021. 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.* 138(1): 4-13. doi: 10.1111/jbg.12507.
8. Bermann, M., **D. Lourenco**, and **I. Misztal**. 2021. Efficient approximation of reliabilities for single-step genomic BLUP models with the Algorithm for Proven and Young. *J. Anim. Sci.* 100(1): skab353. doi: 10.1093/jas/skab353.
9. Bermann, M., **D. Lourenco**, and **I. Misztal**. 2021. Technical note: Automatic scaling in single-step GBLUP. *J. Dairy Sci.* 104: 2027-2031. doi: 10.3168/jds.2020-18969.
10. Bermann, M., **D. Lourenco**, V. Breen, R. Hawken, A. Legarra, and **I. Misztal**. 2021. Modeling genetic differences of combined broiler chicken populations in single-step GBLUP. *J. Anim. Sci.* 99(4): skab056. doi: 10.1093/jas/skab056.
11. Butler, M. L., A. R. Hartman, **J. M. Bormann**, **R. L. Weaber**, D. M. Grieger, and **M. M. Rolf**. 2021. Genetic parameter estimation of beef bull semen attributes. *J. Anim. Sci.* 99(2): skab013. doi: 10.1093/jas/skab013.
12. Butler, M. L., A. R. Hartman, **J. M. Bormann**, **R. L. Weaber**, D. M. Grieger, and **M. M. Rolf**. 2022. Genome-wide association study of beef bull semen attributes. *BMC Genomics* 23: 74. doi: 10.1186/s12864-021-08256-z. *Accepted 2021.
13. Castro Dias Cuyabano, B., G. Rovere, D. Lim, T. H. Kim, H. K. Lee, S. H. Lee and **C. Gondro** (2021). GPS coordinates for modelling correlated herd effects in genomic prediction models applied to Hanwoo beef cattle. *Animals* 11(7):2050. doi: 10.3390/ani11072050.

14. Cesarani, A., S. Biffani, A. L. S. Garcia, **D. Lourenco**, G. Bertolini, G. Neglia, **I. Misztal**, and N. P. P. Macciotta. 2021. Genomic investigation of milk production in Italian Buffalo. *Italian J. Anim. Sci.* 20(1): 539-547. doi: 10.1080/1828051X.2021.1902404.
15. Cesarani, A., A. Garcia, J. Hidalgo, L. Degano, D. Vicario, N. P. P. Macciotta, and **D. Lourenco**. 2021. Genomic information allows for more accurate breeding values for milkability in dual-purpose Italian Simmental cattle. *J. Dairy Sci.* 104(5): 5719-5727. doi: 10.3168/jds.2020-19838.
16. Cesarani, A., **Y. Masuda**, S. Tsuruta, E. L. Nicolazzi, P. M. VanRaden, **D. Lourenco**, and **I. Misztal**. 2021. Single-step genomic predictions for production traits in US Holsteins with unknown parent groups. *J. Dairy Sci.* 104(5): 5843-5853. doi: 10.3168/jds.2020-19789.
17. Engle, B., M. Masters, J. A. Boles, and **J. Thomson**. 2021. Gene expression and carcass traits are different between different quality grade groups in red-faced Hereford steers. *Animals* 11(7): 1910. doi: 10.3390/ani11071910.
18. Falchi, L., G. Gaspa, A. Cesarani, F. Correddu, L. Degano, D. Vicario, **D. Lourenco**, and N. P. P. Macciotta. 2021. Investigation of β -hydroxybutyrate in early lactation of Simmental cows: genetic parameters and genomic predictions. *J. Anim. Breed. Genet.* 138(6): 708-718. doi: 10.1111/jbg.12637.
19. Flesch, E., T. Graves, **J. Thomson**, K. Proffitt, and R. Garrott. 2021. Average kinship within bighorn sheep populations is associated with connectivity, augmentation, and bottlenecks. *Ecosphere* (Accepted Oct 21, 2021).
20. Giess, L. K., B. R. Jensen, **J. M. Bormann**, **M. M. Rolf**, and **R. L. Weaber**. 2021. Genetic parameter estimates for feet and leg traits in Red Angus cattle. *J. Anim. Sci.* 99(11): skab256. doi: 10.1093/jas/skab256.
21. Han, J., **C. Gondro**, K. Reid, J. P. Steibel. 2021. Heuristic hyperparameter optimization of deep learning models for genomic prediction. *G3: Genes, Genomes, Genetics* 11(7): jkab032. doi: 10.1093/g3journal/jkab032.
22. Hidalgo, J., **D. Lourenco**, S. Tsuruta, **Y. Masuda**, V. Breen, R. Hawken, M. Bermann, and **I. Misztal**. 2021. Investigating the persistence of accuracy of genomic predictions over time in broilers. *J. Anim. Sci.* 99(9): skab239. doi: 10.1093/jas/skab239.
23. Hidalgo, J., **D. Lourenco**, S. Tsuruta, **Y. Masuda**, S. Miller, M. Bermann, and **I. Misztal**. 2021. Changes in genomic predictions when new information is added. *J. Anim. Sci.* 99(2): skab04. doi: 10.1093/jas/skab004.
24. Hieber, J. K., R. L. Endecott, J. A. Boles, and **J. M. Thomson**. 2021. Identification of genomic regions for carcass quality traits within the American Simmental Association carcass merit program. *Animals* 11(2): 471. doi: 10.3390/ani11020471.
25. Hollifield, M. K., **D. Lourenco**, M. Bermann, J. Howard, Y. Huang, and **I. Misztal**. 2021. Determining stability of accuracy of genomic estimated breeding values in future generations in commercial pig populations. *J. Anim. Sci.* 99(4): skab085. doi: 10.1093/jas/skab085.
26. Hollifield, M. K., **D. Lourenco**, S. Tsuruta, M. Bermann, J. T. Howard, **I. Misztal**. 2021. Impact of including the cause of missing records on genetic evaluations for growth in commercial pigs. *J. Anim. Sci.* 99(8): skab226. doi: 10.1093/jas/skab226.
27. Kelly, S., T. Voegerl, W. Banzhaf, **C. Gondro**. 2021. Evolving hierarchical memory-prediction machines in multi-task reinforcement learning. *Genetic Programming and Evolvable Machines* 22: 573-605. doi: 10.1007/s10710-021-09418-4.

28. Kluska, S., **Y. Masuda**, F. Baldi, J. P. Eler, J. B. S. Ferraz, A. Legarra, and **D. Lourenco**. 2021. Metafounders may be able to reduce bias in composite cattle genomic predictions. *Front. Genet.* 12: 678587. doi: 10.3389/fgene.2021.678587.
29. Kordowitzki, P., A. Haghani, J. A. Zoller, C. Z. Li, K. Raj, **M. L. Spangler**, and S. Horvath. 2021. Epigenetic clock and methylation study of oocytes from a bovine model of reproductive aging. *Ageing Cell* 20(5): e13349. doi: 10.1111/accel.13349.
30. Leite, N. G., E. F. Knol, A. L. S. Garcia, M. S. Lopes, L. Zak, S. Tsuruta, F. F. Silva, and **D. Lourenco**. 2021. Investigating pig survival in different production phases using genomic models. *J. Anim. Sci.* 99(8): skab217. doi: 10.1093/jas/skab217.
31. MacNeil, M. D., J. W. Buchanan, **M. L. Spangler**, and E. Hay. 2021. Effects of management decisions on genetic evaluation of simulated calving records using random regression. *Trans. Anim. Sci.* 5(2): txab078. doi: 10.1093/tas/txab078.
32. Mancin, E., **D. Lourenco**, M. Bermann, R. Mantovani, and **I. Misztal**. 2021. Accounting for population structure and phenotypes from relatives in association mapping. *Front. Genet.* 12: 642065. doi: 10.3389/fgene.2021.642065.
33. **Masuda, Y.**, P. VanRaden, S. Tsuruta, **D. Lourenco**, and **I. Misztal**. 2021. Invited review: Unknown-parent groups and metafounders in single-step genomic BLUP. *J. Dairy Sci.* 105(2): 923-939. doi: 10.3168/jds.2021-20293.
34. **Misztal, I.**, I. Aguilar, **D. Lourenco**, L. Ma, J. P. Steibel, and M. Toro. 2021. Emerging issues in genomic selection. *J. Anim. Sci.* 99(6): skab092. doi: 10.1093/jas/skab092.
35. O'Shea-Stone, G., R. Lambert, B. Tripet, J. Berardinelli, **J. Thomson**, V. Copié, and R. Garrott. 2021. H NMR based metabolic profiling distinguishes the differential impact of capture techniques on wild bighorn sheep. *Scientific Reports* 11: 11308. doi: 10.1038/s41598-021-90931-y.
36. Ribeiro, A., **B. L. Golden**, and **M. L. Spangler**. 2021. Categorization of birth weight phenotypes for inclusion in genetic evaluations using a Deep Neural Network. *J. Anim. Sci.* 99(3): skab053. doi: 10.1093/jas/skab053.
37. Ribeiro, A. M. F., L. P. Sanglard, W. M. Snelling, **R. M. Thallman**, **L. A. Kuehn**, and **M. L. Spangler**. 2021. Genetic parameters, heterosis, and breed effects for body condition score and mature cow weight in beef cattle. *J. Anim. Sci.* *Accepted*. doi: 10.1093/jas/skac017.
38. Russell, C. A., E. J. Pollak, and **M. L. Spangler**. 2021. Genetic parameter estimates for bull prolificacy and its relationship with scrotal circumference in a commercial beef cattle population. *Transl. Anim. Sci.* 5(3): txab128. doi: 10.1093/tas/txab128.
39. See, G. M., B. E. Mote, and **M. L. Spangler**. 2021. Selective genotyping and phenotypic data inclusion strategies of crossbred progeny for combined crossbred and purebred selection in swine breeding. *J. Anim. Sci.* 99(3): skab041. doi: 10.1093/jas/skab041
40. See, G. M., B. E. Mote, and **M. L. Spangler**. 2021. Bias in variance component estimation in swine crossbreeding schemes using selective genotyping and phenotyping strategies. *J. Anim. Sci.* 99(11): skab293. doi: 10.1093/jas/skab293.
41. Shook, J. M., **D. Lourenco**, and A. K. Singh. 2021. PATRIOT: A pipeline for tracing identical-by-descent chromosome segments to improve genomic prediction in self-pollinating crop species. *Front. Plant Sci.* 12: 676269. doi: 10.3389/fpls.2021.676269.

42. Singh A., A. Kumar, **C. Gondro**, A.R. da Silva Romero, A. Karthikeyan, A. Mehrotra, A. K. Pandey, T. Dutt, B. P. Mishra. 2021. Identification of genes affecting milk fat and fatty acid composition in Vrindavani crossbred cattle using 50K SNP-Chip. *Tropical Animal Health Production* 53(3): 347. doi: 10.1007/s11250-021-02795-z.
43. Steyn, Y., D. Gonzalez-Pena, N. Vukasinovic, S. K. DeNise, **D. Lourenco**, and **I. Misztal**. 2021. Indirect genomic predictions for milk yield in crossbred dairy cattle. *J. Dairy Sci.* 104(5): 5728-5737. doi: 10.3168/jds.2020-19451.
44. Steyn, Y., **D. Lourenco**, C. Y. Chen, B. Valente, J. Holl, W. O. Herring, and **I. Misztal**. 2021. Optimal definition of contemporary groups for crossbred pigs in a joint pure- and crossbred genetic evaluation. *J. Anim. Sci.* 99(1): skaa396. doi: 10.1093/jas/skaa396.
45. Sungkhapreecha, P., **I. Misztal**, J. Hidalgo, **D. Lourenco**, S. Buaban, M. Duangjinda, and W. Boonkum. 2021. Validation of single-step genomic predictions using the linear regression method for milk yield and heat tolerance in a Thai-Holstein population. *Veterinary World* 14(12): 3119-3125. doi: 10.14202/vetworld.2021.3119-3125.
46. Tahir, M. S., L. R. Porto-Neto, **C. Gondro**, O. B. Sithu, K. Wockner, A. W. L. Tan, H. R. Smith, G. C. Gouveia, J. Kour, M. R. S. Fortes. 2021. Meta-analysis of heifer traits identified reproductive pathways in *Bos indicus* cattle. *Genes* 12(5): 768. doi: 10.3390/genes12050768.
47. Tonusi, R. L., M. Londono-Gil, R. M. O. Silva, A. F. B. Magalhaes, S. T. Amorin, S. Kluska, R. Espigolan, E. Peripoli, A. S. C. Pereira, R. B. Lobo, I. Aguilar, **D. A. L. Lourenco**, and F. Baldi. 2021. Accuracy of genomic breeding values and predictive ability for postweaning liveweight and age at first calving in a Nellore cattle population with missing sire information. *Trop. Anim. Health Prod.* 53: 432. doi: 10.1007/s11250-021-02879-w.
48. Tsuruta, S., T. J. Lawlor, **D. A. L. Lourenco**, and **I. Misztal**. 2021. Bias in genomic predictions by mating practices for linear type traits in a large-scale genomic evaluation. *J. Dairy Sci.* 104(1): 662-677. doi: 10.3168/jds.2020-18668.
49. Tsuruta, S., **D. A. L. Lourenco**, **Y. Masuda**, **I. Mistal**, and T. J. Lawlor. 2021. Reducing computational cost by indirect genomic prediction in large-scale genomic evaluation. *J. Dairy Sci. Comm.* 2(6): 356-360. doi: 10.3168/jdsc.2021-0097.
50. Wottlin, L. R., G. E. Carstens, W. C. Kayser, W. E. Pinchak, **J. M. Thomson**, V. Copié, and G. P. O'Shea-Stone. 2021. Differential haptoglobin responsiveness to a *Mannheimia haemolytica* challenge altered immunologic, physiologic, and behavior responses in beef steers. *J. Anim. Sci.* 99(1): skaa404. doi: 10.1093/jas/skaa404.
51. Vargas, J. N., **L. A. Kuehn**, J. W. Keele, and R. M. Lewis. 2021. Accuracy of GEBV of sires based on pooled allele frequency of their progeny. *G3: Genes, Genomes, Genetics* 11(11): jkab231. doi: 10.1093/g3journal/jkab231.
52. 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. 2021. Molecular marker prediction for days open and pregnancy rate in Holstein cows managed in a warm climate. *Livest. Sci.* 250: 104536. doi: 10.1016/j.livsci.2021.104536.
53. Zhai, C., L. C. Li Puma, A. J. Chicco, A. Omar, R. J. Delmore, I. Geornaras, **S. E. Speidel**, T. N. Holt, **M. G. Thomas**, **R. M. Enns**, and M. N. Nair. 2021. Pulmonary arterial pressure in fattened Angus steers at moderate altitude influences early postmortem mitochondria functionality and meat color during retail display. *J. Anim. Sci.* *Accepted skac002. doi: 10.1093/jas/skac002.

54. Zimmermann, M. J., **L. A. Kuehn, M. L. Spangler, R. M. Thallman**, W. M. Snelling, and R. M. Lewis. 2021. Breed and heterotic effects for mature weight in beef cattle. *J. Anim. Sci.* 99(8): skab209. doi: 10.1093/jas/skab209

Abstracts & Proceedings

1. Abdollahi-Arpanahi, R., **D. Lourenco**, and **I. Misztal**. 2021. 35 Detecting effective starting point of genomic selection by divergent trends from BLUP and ssGBLUP. *J. Anim. Sci.* 99(Supplement_3): 19. doi: 10.1093/jas/skab235.031.
2. Bermann, M., **D. Lourenco**, V. Breen, R. Hawken, F. B. Lopes, and **I. Misztal**. 2021. Modelling genetic differences of combined broiler chicken populations in single-step GBLUP. *Proc. 72nd European Association for Animal Production*, p. 203. Available at: <https://meetings.eaap.org/previous-annual-meetings/> (Last Accessed 31 Jan 2022).
3. Bermann, M., **D. Lourenco**, V. Breen, R. Hawken, F. B. Lopes, and **I. Misztal**. 2021. PSXII-9 Modeling genetic differences of combined broiler chicken populations in single-step GBLUP. *J. Anim. Sci.* 99(Supplement_3): 254. doi: 10.1093/jas/skab235.464.
4. Bermann, M., **D. Lourenco, Y. Masuda**, and **I. Misztal**. 2021. A fast method for approximating reliabilities in genomic BLUP. *Proc. 72nd European Association for Animal Production*, p. 208. Available at: <https://meetings.eaap.org/previous-annual-meetings/> (Last Accessed 31 Jan 2022).
5. Bermann, M., **D. Lourenco**, and **I. Misztal**. 2021. 202 Automatic scaling in single-step genomic BLUP. *Proc. 2021 American Dairy Science Association Annual Meeting*, p. 78-79. Available at: adsa.org/2021 (Last accessed 28 Jan 2022).
6. Bouffiou, J., J. Boles, and **J. Thomson**. 2021. PSXIII-20 Using 1H NMR Spectroscopy reveals metabolite markers associated to temperament and carcass quality in feedlot cattle. *J. Anim. Sci.* 99(Supplement_3):438. doi: 10.1093/jas/skab235.784.
7. Bruno, K., C. Ahlberg-Smith, L. J. McPhillips, H. N. Meador, A. Taylor, M. Calvo-Lorenzo, U. DeSilva, C. R. Krehbiel, R. G. Mateesku, S. E. Place, **M. M. Rolf**, D. L. VanOverbeke, B. K. Wilson and C. J. Richards. 2021. Effects of prolonged water restriction on the behavior of feedlot steers. *Proc. 2021 Animal Behavior Society Annual Virtual Meeting*. Not currently available online.
8. Bruno, K., C. Ahlberg-Smith, L. J. McPhillips, H. N. Meador, A. Taylor, M. Calvo-Lorenzo, U. DeSilva, C. R. Krehbiel, R. G. Mateesku, S. E. Place, **M. M. Rolf**, D. L. VanOverbeke, B. K. Wilson and C. J. Richards. 2021. 276 Water use efficiency relationship with feedlot steer performance and health. *J. Anim. Sci.* 99(Supplement_3): 142. doi: 10.1093/jas/skab235.260.
9. Cesarani, A., **D. Lourenco, Y. Masuda**, S. Tsuruta, A. Legarra, E. Nicolazzi, P. Vanraden, and **I. Misztal**. 2021. Multi-breed genomic evaluation for dairy cattle in the US using single-step GBLUP. *Proc. 72nd European Association for Animal Production*, p. 207. Available at: <https://meetings.eaap.org/previous-annual-meetings/> (Last Accessed 31 Jan 2022).
10. Cesarani, A., **D. Lourenco, Y. Masuda**, S. Tsuruta, A. Legarra, E. Nicolazzi, P. VanRaden, and **I. Misztal**. 2021. Multi-breed genomic evaluation for dairy cattle in the US using single-step GBLUP. *Proc. 2021 ICAR Interbull Virtual Meeting*. Available at: https://interbull.org/ib/programme_virtual_2021 (Last Accessed 31 Jan 2022).

11. Chen, X., W. Ogdahl, **L. L. Hulsman Hanna**, C. R. Dahlen, D. G. Riley, S. A. Wagner, E. P. Berg, and X. Sun. 2021. Evaluation of beef cattle temperament by eye temperature using infrared thermography technology. *Computers and Electronics in Agriculture* 199: 106321. doi: 10.1016/j.compag.2021.106321.
12. Duggan, K. L., T. N. Holt, **M. G. Thomas**, **S. E. Speidel**, and **R. M. Enns**. 2021. Effect of pulmonary arterial pressure and annual precipitation on reproductive performance of Angus heifers in south central Wyoming. *Trans. Anim. Sci.* 5(Supplement_S1): S175-S179. doi: 10.1093/tas/txab189.
13. Flesch, E., C. Lee, B. Shapiro, **J. Thomson**, and R. Garrott. 2021. Comparing ancient and contemporary bighorn sheep populations using bones recovered from ice patches in the Greater Yellowstone Area. *Proc. 5th International Frozen Past Glacial and Ice Patch Archaeology Conference*, p. 34. Available at: <https://instaar.colorado.edu/meetings/frozenpasts5/program.html> (Last accessed 28 Jan 2022).
14. Giess, L. K., **M. G. Thomas**, **S. E. Speidel**, **M. M. Culbertson**, **W. R. Schafer**, S. C. McGuire, and **R. M. Enns**. 2021. Whole herd reporting data from the American Simmental Association as a data source for heifer pregnancy phenotypes. *Trans. Anim. Sci.* 5(Supplement_S1): S199-S203. doi: 10.1093/tas/txab152.
15. Golder, H. M., I. J. Lean, S. J. LeBlanc, T. Duffield, H. A. Rossow, R. Bogdanich, L. Hernandez, E. Block, and **J. Thomson**. 2021. 140 Genome, ruminal metabolome, and milk associations in lactating Holsteins. *Proc. 2021 American Dairy Science Association Annual Meeting*, p. 53. Available at: adsa.org/2021 (Last accessed 28 Jan 2022).
16. González-Murray, R. A., P. G. Martínez, V. Vigil, H. Yazar-Gunes, M. A. Sánchez-Castro, **R. M. Enns**, **S. E. Speidel**, and **M. G. Thomas**. 2021. Heterosis effects on age at first calving in a multibreed beef cattle herd in Panama. *Trans. Anim. Sci.* 5(Supplement_S1): S185-S188. doi: 10.1093/tas/txab169.
17. Hartman, A. R., M. L. Butler, E. D. McCabe, **M. M. Rolf**, **R. L. Weaber**, **J. M. Bormann**, and D. M. Grieger. 2021. PSV-5 Effect of breed and barn location on semen quality at an artificial insemination facility. *J. Anim. Sci.* 99(Supplement_1): 210. doi: 10.1093/jas/skab054.344.
18. Heffernan, K. R., **R. M. Enns**, H. D. Blackburn, **S. E. Speidel**, C. S. Wilson, and **M. G. Thomas**. 2021. Case study of inbreeding within Japanese Black cattle using resources of the American Wagyu Association, National Animal Germplasm Program, and a cooperator breeding program in Wyoming. *Trans. Anim. Sci.* 5(Supplement_S1): S170-S174. doi: 10.1093/tas/txab181.
19. Hidalgo, J., **D. Lourenco**, S. Tsuruta, **Y. Masuda**, V. Breen, R. Hawken, M. Bermann, and **I. Misztal**. 2021. Decay of accuracy of genomic predictions over time in broilers. *Proc. 72nd European Association for Animal Production*, p. 461. Available at: <https://meetings.eaap.org/previous-annual-meetings/> (Last Accessed 31 Jan 2022).
20. Hidalgo, J., **D. Lourenco**, S. Tsuruta, **Y. Masuda**, V. Breen, R. Hawken, M. Bermann, and **I. Misztal**. 2021. 44 Accuracy of genomic predictions over time in broilers. *J. Anim. Sci.* 99(Supplement_3): 28. doi: 10.1093/jas/skab235.047.
21. Hollifield, M. K., **D. Lourenco**, S. Tsuruta, M. Bermann, J. T. Howard, and **I. Misztal**. 2021. 33 Impact of including the cause of missing records on genetic evaluations for growth in commercial pigs. *J. Anim. Sci.* 99(Supplement_3): 18. doi: 10.1093/jas/skab235.029.

22. Jang, S., S. Tsuruta, N. Leite, **I. Misztal**, and **D. Lourenco**. 2021. Dimensionality of genomic information and its impact on GWA and variant selection. Proc. 72nd European Association for Animal Production, p. 456. Available at: <https://meetings.eaap.org/previous-annual-meetings/> (Last Accessed 31 Jan 2022).
23. Jang, S., S. Tsuruta, N. Leite, **I. Misztal**, and **D. Lourenco**. 2021. 34 Dimensionality of genomic information and its impact on GWA and variant selection: A simulation study. J. Anim. Sci. 99(Supplement_3): 20. doi: 10.1093/jas/skab235.033.
24. Kopsa, C., D. LaKamp, **J. Bormann**, **R. L. Weaber**, and **M. M. Rolf**. 2021. Using environmental variables to predict regional and seasonal differences in forage net energy estimates. KSU Undergraduate research symposium. Manhattan, KS, USA. Not currently available online.
25. Kukor, I. M., **M. G. Thomas**, **R. M. Enns**, T. N. Holt, **S. E. Speidel**, M. A. Cleveland, B. P. Holland, A. B. Word, and G. B. Ellis. 2021. Sire differences within heart and heart fat score in beef cattle. Trans. Anim. Sci. 5(Supplement_S1): S149–S153. doi: 10.1093/tas/txab147.
26. Lakamp, A. D., D. Aherin, D. Spencer, R. Larson, **R. L. Weaber**, **J. M. Bormann**, and **M. M. Rolf**. 2021. 235 Resource use for beef cattle in the North Central Great Plains. J. Anim. Sci. 99(Supplement_1): 12. doi: 10.1093/jas/skab054.020.
27. Leite, N., C.-Y. Chen, W. O. Herring, S. Tsuruta, and **D. Lourenco**. 2021. 49 Predicting breeding values of purebred pigs for crossbred performance using crossbred phenotypes and genotypes. J. Anim. Sci. 99(Supplement_3): 23. doi: 10.1093/jas/skab235.038.
28. Leite, N. G., E. F. Knol, S. Nuphaus, S. Tsuruta, and **D. Lourenco**. 2021. Genetic study of social interaction models for the predictability of overall biting in gilts. Proc. 72nd European Association for Animal Production, p. 189. Available at: <https://meetings.eaap.org/previous-annual-meetings/> (Last Accessed 31 Jan 2022).
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1. Saad, H., **S. E. Speidel**, and **R. M. Enns**. 2021. Report to Leachman Cattle of Colorado – Development of a Foot Score EPD.
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Book Chapters

1. 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 949-977. In: *Bovine Reproduction*. Edited by Richard Hopper. Wiley. (ebook ISBN: 978-1-119-60246-0, print ISBN: 978-1-119-60236-1).

Extension/Popular Press Articles

2. **Enns, R. M.** 2021. Tools for economic improvement beyond EPD. In: *NBCEC Sire Selection Manual, 3rd Edition*. Edited by D. Bullock. National Beef Cattle Evaluation Consortium. Pg 24-28.
3. **Rolf, M. M.**, and **J. M. Bormann**. 2021. Data collection. In: *NBCEC Sire Selection Manual, 3rd Edition*. Edited by D. Bullock. National Beef Cattle Evaluation Consortium. Pg 12-18.
4. **Spangler, M. L.** 2021. Expected progeny differences. In: *NBCEC Sire Selection Manual, 3rd Edition*. Edited by D. Bullock. National Beef Cattle Evaluation Consortium. Pg 19-20.
5. **Spangler, M. L.** 2021. Interpretation and use of expected progeny differences. In: *NBCEC Sire Selection Manual, 3rd Edition*. Edited by D. Bullock. National Beef Cattle Evaluation Consortium. Pg 21-23.
6. **Spangler, M. L.** 2021. Decision support systems. In: *NBCEC Sire Selection Manual, 3rd Edition*. Edited by D. Bullock. National Beef Cattle Evaluation Consortium. Pg 29-30.
7. **Weaber, R. L.** 2021. Crossbreeding for commercial beef production. In: *NBCEC Sire Selection Manual, 3rd Edition*. Edited by D. Bullock. National Beef Cattle Evaluation Consortium. Pg 31-38.
8. **Weaber, R. L.** 2021. Breed and composite selection. In: *NBCEC Sire Selection Manual, 3rd Edition*. Edited by D. Bullock. National Beef Cattle Evaluation Consortium. Pg 40-44.

Theses/Dissertations

1. Bhowmik, N. 2021. Ancestral breed grouping for improving animal modeling in admixed populations and its use in Leptin (genetic and hormone) association studies with performance traits in commercial beef cow herd. **North Dakota State University**.

2. Bouffiu, J. 2021. The use of nuclear magnetic resonance spectroscopy and measures of cattle temperament to predict feedlot performance of commercial beef cattle. **Montana State University.**
3. Celestino, E. 2021. Measurements of beef cattle temperament and effects of temperament on beef cattle productive and reproductive traits. **North Dakota State University.**
4. Lakamp, A. 2021. Genetic influence on predicted methane production and natural resource allocation of beef cattle in the Great Plains. **Kansas State University.**
5. Oribamise, V. 2021. Estimation of non-additive genetic parameters of sheep reproductive traits in multiple breeds. **North Dakota State University.**
6. Shaffer, W. 2021. Modeling phenotypic plasticity as an indicator of adaptability in beef cattle. **Kansas State University.** *Pending final edits.
7. Schumacher, M. 2021. A comparative approach to refine molecular mechanisms impacting meat quality and carcass. **Montana State University.**
8. Upshaw, K. 2021. Genetic abnormalities in Hereford cattle: the detection of vertical fiber hide defect and identification of quantitative trait loci associated with ocular squamous cell carcinoma. **Kansas State University.**
9. Zimprich, T.R. 2021. Yearling pulmonary arterial pressure at moderate elevations as a varied indicator for pulmonary arterial pressure at high elevations in beef bulls in Colorado. **Colorado State University.**

Presentations

1. Bormann, J. 2021. Target selection to meet consumer demands. Beef Improvement Federation Annual Symposium, Des Moines, IA, USA.
2. Bormann, J. 2021. Researching genetic components of environmental impacts. National Beef Cattle Evaluation Consortium Brown Bagger Webinar Series (Virtual).
3. Colorado State University members. 2021. Fundamentals of data collection and evaluation. American Wagyu Association Annual Meeting, Fort Collins, CO, USA.
4. Colorado State University members. 2021. Advancements in understanding of pulmonary arterial pressure as a predictor of pulmonary hypertension in mountain and feedlot cattle. CVMBS Annual Conference for Veterinarians and Technicians, Fort Collins, CO, USA.
5. Colorado State University members. 2021. Sire differences within heart and heart fat score in beef cattle, Certified Angus Beef Feeding Quality Forum, Fort Collins, CO, USA.
6. Culbertson, R. 2021. IGS: How it works for seedstock and commercial producers. Beef Improvement Federation Annual Symposium, Des Moines, IA, USA.
7. Decker, J. 2021. A piece of the adaptability puzzle: Multi-breed hair-shedding genetic effects and EPDs. Beef Improvement Federation Annual Symposium, Des Moines, IA, USA.
8. Enns, R. M. 2021. Sire differences within heart and heart fat score in beef cattle. Beef Improvement Federation Annual Symposium, Des Moines, IA, USA.
9. Golden, B. 2021. Examining the impact of situational indexes on selection decisions. Beef Improvement Federation Annual Symposium, Des Moines, IA, USA.
10. Gondro, C. 2021. Genomic prediction and epistasis: disentangling the relationship between epistatic variance, linear models and genetic architectures. SBMA Brazil (invited).

11. Gondro, C. 2021. Practical (and not yet quite practical) applications of genomic technologies to improve meat quality. American Meat Science Association 2021 RMC (invited).
12. Lourenco, D. 2021. Experiences with Large-scale Genomic Evaluations. In IFFAGBR - International Frontiers Forum on Animal Genetics, Breeding, and Reproduction. China (Virtual).
13. Lourenco, D. 2021. Genômica no melhoramento animal: experiências, desafios, e expectativas futuras. In SBMA Meeting. Brazil (Virtual).
14. Lourenco, D. 2021. Stability of breeding values in the genomic era. In 72nd EAAP – European Association for Animal Production. Davos, Switzerland.
15. Lourenco, D. 2021. Situação atual e perspectivas futuras para o uso da genômica no melhoramento animal. In 56 ABCZ Meeting. Brazil (Virtual).
16. Lourenco, D. 2021. Single-step genomic predictions for yield traits in US Holsteins with unknown parent groups and phenotype-pedigree truncation. In American Dairy Science Association Annual Meeting (Virtual).
17. Lourenco, D. 2021. When is sequence data going to help increasing accuracy of genomic predictions in livestock? In American Society of Animal Science Annual Meeting, Louisville, KY, USA.
18. Lourenco, D. 2021. Single-step genomic predictions for yield traits in US Holsteins with UPG and phenotype-pedigree truncation. In Interbull Meeting (Virtual).
19. Lourenco, D. 2021. Updates on multibreed ssGBLUP evaluations. In Workshop at CDCB (Council on Dairy Cattle Breeding). Bowie, MD, USA.
20. Lourenco, D. 2021. Are threshold models feasible for genetic evaluations? In 75. Wageningen University and Breed4Food Workshop. Wageningen University (Virtual).
21. Lourenco, D. 2021. Lessons learned from single-step in pigs and other species. In Innovation hour at Fast Genetics. Canada (Virtual).
22. Lourenco, D. 2021. Experience, challenges, and ongoing research in genomic selection. In Seminar at University of Sassari. Sassari, Italy.
23. Lourenco, D. 2021. Introduction to BLUPF90 software suite. In Seminar at Bayer CropScience (Virtual).
24. Lourenco, D. 2021. Developments in Genomic Selection. In Seminar at AbacusBio. New Zealand (Virtual).
25. Kuehn, L.A. 2021. An introduction to the ARS Beef Grand Challenge Project. Beef Improvement Federation Annual Symposium, Des Moines, IA, USA.
26. Nawaz, M. Y., R. P. Savegnago, and C. Gondro. 2021. Identifying Genomic Signatures of Selection in Hanwoo and Angus Beef Cattle Using Imputed Whole Genome Sequence. American Society of Animal Science Annual Meeting, Louisville, KY, USA.
27. Ostrovski, H., R. P. Savegnago, W. Huang, and C. Gondro. 2021. Real-Time, On-Site Whole Genome Sequencing with Oxford Nanopore Technologies' MinION. American Society of Animal Science Annual Meeting, Louisville, KY, USA.
28. Spangler, M.L. 2021. Making the best of the data we have to improve the accuracy of genomic predictions, University of Florida Animal Breeding and Genetics seminar (Virtual).
29. Spangler, M.L. 2021. Application of advanced genetic technology in beef cattle. King Ranch Institute for Ranch Management (Virtual).
30. Spangler, M.L. 2021. A discussion on 'optimums', Angus Genetics Inc. board meeting, Nebraska City, NE, USA.

31. Spangler, M.L. 2021. Animal genetics, Lincoln public school summer institute workshop, Lincoln, NE, USA.
32. Spangler, M.L. 2021. Genetic technology in beef cattle, H-Calf webinar series (Houston Livestock Show and Rodeo Educational Program).
33. Spangler, M.L. 2021. The future role of genomics and genetic evaluations in the beef industry, Select Sires strategic planning meeting, Nebraska City, NE, USA.
34. Spangler, M.L. and R.M. Thallman. 2021. Proposed Guideline Revisions for Contemporary Groups, Beef Improvement Federation Annual Symposium, Des Moines, IA, USA.
35. Spangler, M.L. 2021. Understand the Value of Accuracy, Beef Improvement Federation Annual Symposium, Des Moines, IA, USA.
36. Spangler, M.L. 2021. An Update and Demonstration of iGENDEC, Beef Improvement Federation Annual Symposium, Des Moines, IA, USA.
37. Spangler, M.L. 2021. Practical Examples of machine Learning in Animal Breeding, Beef Improvement Federation Annual Symposium, Des Moines, IA, USA.
38. Spangler, M.L. 2021. Cattle breeds and selection basics. On the Farm Genetics and Heredity Professional Development for High School Teachers (Livestream).
39. Spangler, M.L. 2021. Practical Uses of Genomics for Ranchers, Cattle U and Trade Show, Dodge City, KS, USA.
40. Spangler, M.L. 2021. Genetic considerations for the cowherd, Nebraska Ranch Practicum (via webinar), Whitman, NE, USA.
41. Spangler, M.L. 2021. An Update on and Demonstration of iGENDEC, Cattlemens College, National Cattlemens Beef Association, Nashville, TN, USA.
42. Spangler, M.L. 2021. What Lies Ahead: Genetics and Genomics, American Gelbvieh Association Board of Directors Meeting (Virtual).
43. Spangler, M.L. 2021. Genetics Considerations in Heifer Development, American Association of Bovine Practitioners Workshop, Salt Lake City, UT, USA.
44. Spangler, M.L. 2021. Genomics: Industry Use, State of Play, and the UNL Framework, Nebraska Integrated Beef Systems Summit, Lincoln, NE, USA.
45. Spangler, M.L. 2021. Considerations for Selecting U.S. Genetics, NE/KS Dept. of Agriculture Chilean trade talks (Virtual).
46. Spangler, M.L. 2021. An Introduction to iGENDEC, North American Limousin Foundation Breed Improvement Committee (Virtual).
47. Thallman, R.M. and A. Snider. 2021. Use of advanced reproductive technologies and inclusion of these records in genetic evaluation. Beef Improvement Federation Annual Symposium, Des Moines, IA, USA.
48. Ward, B., K. E. Belk, and M. G. Thomas. 2021. Documentary of the history of American Wagyu cattle. American Wagyu Association Annual Meeting, Fort Collins, CO, USA.
49. Weaber, R. 2021. Using beef on dairy data to increase the accuracy of selection decisions for carcass traits. Beef Improvement Federation Annual Symposium, Des Moines, IA, USA.