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Education

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| 2014 | Georgetown University, Washington, DC
Certificate in Legislative Studies |
| 2003 | Louisiana State University, Baton Rouge, LA
Ph.D. in Animal, Dairy, and Poultry Science |
| 1996 | Louisiana State University, Baton Rouge, LA
M.S. in Animal and Dairy Science (Minor: Applied Statistics) |
| 1994 | Louisiana State University, Baton Rouge, LA
B.S. in Animal Systems (Dairy Production) (Minor: Microbiology) |

Appointments

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| January 2016–
Present | Acting Research Leader , Animal Genomics and Improvement Laboratory,
Henry A. Wallace Beltsville Research Center, Agricultural Research
Service, USDA, Beltsville, MD |
| May 2014–
December 2015 | Research Geneticist (Animals) , Animal Genomics and Improvement
Laboratory, Henry A. Wallace Beltsville Research Center, Agricultural
Research Service, USDA, Beltsville, MD |
| January 2011–
December 2011 | Legislative Fellow , Senator Mark L. Pryor, United States Senate,
Washington, DC (Training detail from USDA) |
| December 2003–
April 2014 | Research Geneticist (Animals) , Animal Improvement Programs
Laboratory, Henry A. Wallace Beltsville Research Center, Agricultural
Research Service, USDA, Beltsville, MD |
| June 2002–
December 2003 | Data Manager , Southern Regional Climate Center, Louisiana State
University, Baton Rouge, LA |
| June 2000–June
2002 | Computer Analyst 2 , College of Education, Louisiana State University,
Baton Rouge, LA |

Awards and Honors

- 2018 **Outstanding Service Award**, National Dairy Herd Information Association
- 2017 **Editor's Choice Article of the Month**, Production: Management and Economics (co-author), Journal of Dairy Science, June 2017
- Editor's Choice Article of the Month**, Production: Breeding, Genetics, and Genomics (co-author), Journal of Dairy Science, May 2017
- Editor's Choice Article of the Month**, Production: Breeding, Genetics, and Genomics (co-author), Journal of Dairy Science, April 2017
- 2016 **Editor's Choice Article of the Month**, Genetics and Breeding (co-author), Journal of Dairy Science, October 2016
- Editor's Choice Article of the Month**, Genetics and Breeding (senior author), Journal of Dairy Science, September 2016
- 2015 **Jay L. Lush Award in Animal Breeding and Genetics**, American Dairy Science Association, for outstanding research in animal breeding with the potential for improvement of dairy cattle
- Award of Recognition**, Council on Dairy Cattle Breeding, for international development of genomic predictions for dairy cattle (group award)
- 2014 **Editor's Choice Article of the Month**, Our Industry Today (co-author), Journal of Dairy Science, July 2014
- Editor's Choice Article of the Month**, Genetics and Breeding (senior author), Journal of Dairy Science, May 2014
- High Impact Research Publication** (one of eight publications selected, co-author), Institute of Food and Agricultural Sciences, University of Florida
- 2013 **Editor's Choice Article of the Month**, Genetics and Breeding (co-author), Journal of Dairy Science, February 2013
- 2010 **USDA Secretary's Honor Award**, Cattle Genomics Consortium, for helping America promote sustainable agricultural production and biotechnology exports as America works to increase food security (group award)
- 2008 **President's Volunteer Service Award**, Silver Award
- 1994 **Southern ADSA-SAD Undergraduate Paper Presentation Contest**, Production, 3rd Place

1993 **Southern ADSA-SAD Undergraduate Paper Presentation Contest,**
Manufacturing, 1st Place

1990 **Recipient of the J. B. Frye, Jr. Scholarship in Dairy Science**

Peer-Reviewed Publications

2019 *Bradford, H.L., Y.M. Masuda, J.B. Cole, I. Misztal, and P.M. VanRaden.* 2019. Modeling pedigree accuracy and uncertain parentage in single-step genomic evaluations of simulated and US Holstein datasets. *J. Dairy Sci.* 102:2308–2318. <https://doi.org/10.3168/jds.2018-15419>.

Cole, J.B. 2019. Promotion of alleles by genome engineering. *CAB Reviews: Perspectives in Agriculture, Veterinary Science, Nutrition and Natural Resources.* (In press.)

Cole, J.B. and M.L. Mueller. 2019. Managing recessive disorders in breeding programs by gene editing. Preprint on bioRxiv: <https://doi.org/10.1101/116459>. (In revision.)

Cole, J.B., D.J. Null, and P.M. VanRaden. 2019. Short communication: Phenotypic and genetic effects of the polled haplotype on yield, longevity, and fertility in U.S. Brown Swiss, Holstein, and Jersey cattle. *J. Dairy Sci.* (In preparation.)

Connor, E.E., *J.L. Hutchison,* and **J.B. Cole.** 2019. Characteristics of residual feed intake measurements in growing and lactating dairy cattle and implications for genetic selection. *J. Dairy Sci.* (Revision submitted.)

Fang, L., J. Jiang, B. Li, Y. Zhou, E. Freebern, P. VanRaden, **J. Cole,** and L. Ma. 2019. Paternal genetic and epigenetic contributions to gestation length in cattle. *Comm. Biol.* (Accepted.)

Fang, L., Y. Zhou, S. Liu, J. Jiang, D.M. Bickhart, D.J. Null, B. Li, S.G. Schroeder, B.D. Rosen, **J.B. Cole,** C.P. Van Tassell, L. Ma, and G.E. Liu. 2019. Integrating signals from sperm methylome analysis and genome-wide association study to understand male fertility in cattle. *Biol. Reprod.* (Submitted.)

Guarini, A.R., M. Sargolzaei, L.F. Brito, V. Kroezen, D.A.L. Lourenco, C.F. Baes, F. Miglior, **J.B. Cole,** and F.S. Schenkel. 2019. Estimating the impact of the deleterious recessive haplotypes AH1 and AH2 on reproduction performance of Ayrshire cattle. *J. Dairy Sci.* (Accepted.)

Jiang, J., **J.B. Cole,** Y. Da, P.M. VanRaden, and L. Ma. 2019. Fast Bayesian fine-mapping of 35 production, reproduction and body conformation traits with imputed sequences of 27K Holstein bulls. *PLOS Genetics* (Submitted.)

Jiang, J., D. Prakapenka, L. Ma, P.M. VanRaden, **J.B. Cole**, and Y. Da. 2019. A large-scale genome-wide association study in U.S. Holstein cattle. BMC Genomics. (Submitted.)

Liu, M., L. Fang, S. Liu, M.G. Pan, E. Seroussi, **J.B. Cole**, L. Ma, H. Chen, and G. Liu. 2019. Array CGH-based detection of CNV regions and their potential association with reproduction and other economic traits in Holsteins. BMC Genomics. (Submitted.)

Ma, L., **J.B. Cole**, Y. Da, and P.M. VanRaden. 2019. Symposium review: Genetics, genome-wide association study, and genetic improvement of dairy fertility traits. J. Dairy Sci. (In press.)
<https://doi.org/10.3168/jds.2018-15269>.

Ma, L., T.S. Sonstegard, **J.B. Cole**, C.P. Van Tassell, G.R. Wiggans, B.A. Crooker, C. Tan, D. Prakapenka, G. Liu, and Y. Da. 2019. Genome changes due to artificial selection in U.S. Holstein cattle. BMC Genomics 20:128.
<https://doi.org/10.1186/s12864-019-5459-x>.

Mueller, M., **J. Cole**, T. Sonstegard, and A. Van Eenennaam. 2019. Comparison of gene editing vs. conventional breeding to introgress the POLLED allele into the U.S. dairy cattle population. J. Dairy Sci. (Accepted.)

Santos, D.J.A., **J.B. Cole**, T.J. Lawlor, P.M. VanRaden, H. Tonhati, and L. Ma. 2019. Variance of gametic diversity and its application in selection programs. J. Dairy Sci. (Revision submitted.)

The Livestock High-Throughput Phenotyping and Big Data Analytics Consortium. 2019. A vision for development and utilization of high-throughput phenotyping and big data analytics in livestock. Front. Genet. (Submitted.)

2018

Heringstad, B., C. Egger-Danner, N. Charfeddine, J. Pryce, K. Stock, J. Kofler, Å.M. Sogstad, M. Holzhauser, A. Fiedler, K.E. Müller, P. Nielsen, G. Thomas, N. Gengler, G. Jong, C. Ødegård, F. Malchiodi, F. Miglior, M. Alsaad, and **J. Cole**. 2018. Invited review: Genetics and claw health: Opportunities to enhance claw health by genetic selection. J. Dairy Sci. 101:4801–4821.

Santos, D.J.A., **J.B. Cole**, D.J. Null, T.M. Byrem, and L. Ma. 2018. Genetic and non-genetic profiling of milk pregnancy-associated glycoproteins in Holstein cattle. J. Dairy Sci. 101:9987-10000.

Tiezzi, F., M.E. Arceo, **J.B. Cole**, and C. Maltecca. 2018. Including gene networks to predict calving ease in Holstein, Brown Swiss and Jersey cattle. BMC Genet. 19:20.

- Cole, J.B.**, J.M. Bormann, C.A. Gill, H. Khatib, J.E. Koltjes, C. Maltecca, and F. Miglior. 2017. Breeding and Genetics Symposium: Resilience of livestock to changing environments. *J. Animal Sci.* 95:1777-1779.
- Cole, J.B.**, and P.M. VanRaden. 2017. Possibilities in an age of genomics: The future of the breeding index. *J. Dairy Sci.* 101:3686–3701.
- Dikmen, S., G.E. Dahl, **J.B. Cole**, *D.J. Null*, and P.J. Hansen. 2017. The Larson Blue coat color phenotype in Holsteins: characteristics and effects on body temperature regulation and production in lactating cows in a hot climate. *J. Animal Sci.* 5:1164-1169.
- Hutchison, J.L.*, P.M. VanRaden, *D.J. Null*, **J.B. Cole**, and D.M. Bickhart. 2017. Benefits associated with reduced age at first calving for U.S. dairy cattle. *J. Dairy Sci.* 100:6853–6861.
- Jiang, J., B. Shen, J.R. O'Connell, P.M. VanRaden, **J.B. Cole**, and L. Ma. 2017. Dissection of additive, dominance, and imprinting effects for production and reproduction traits in Holstein cattle. *BMC Genomics.* 18:425.
- McClure, M.C., T.S. Sonstegard, C.W. Wolfe, *D.J. Null*, D.M. Bickhart, L. Xu, H.J. Huson, H.D. Blackburn, G.R. Wiggans, G.E. Liu, **J.B. Cole**, and C.P. Van Tassell. 2017. A rectovaginal constriction defect of Jersey cattle maps to the location of the Early B-Cell 1 Factor (*EBF1*) gene on chromosome 7. *Genet. Sel. Evol.* (Submitted.)
- Oliveira, Jr., G.A., T.C.S. Chud, R.V. Ventura, D.J. Garrick, **J.B. Cole**, D.P. Munari, J.B.S. Ferraz, E. Mullart, S. DeNise, and M.V.G.B. da Silva. 2017. Genotype imputation in a crossbred (*Bos primigenius indicus* × *Bos primigenius taurus*) dairy cattle population. *J. Dairy Sci.* 100:9623–9634.
- Oliveira, Jr., G.A., B.C. Perez, **J.B. Cole**, M.H.A. Santana, J. Silveira, G. Mazzoni, R.V. Ventura, M.L. Santana, Jr., H.N. Kadarmideen, D.J. Garrick, and J.B.S. Ferraz. 2017. Genomic study and MeSH enrichment analysis of early pregnancy rate and antral follicle numbers in Nelore heifers. *J. Animal Sci.* 95:4796-4812.
- Ortega, M.S.*, A.C. Denicol, **J.B. Cole**, *D.J. Null*, J.F. Taylor, R.D. Schnabel, and P.J. Hansen. 2017. Association of single nucleotide polymorphisms in candidate genes previously related to genetic variation in fertility with phenotypic measurements of reproductive function in Holstein cows. *J. Dairy Sci.* 100:3725–3734.
- Ortega, M.S.*, S. Wohlgemuth, P. Tribulo, L.G. Siqueira, *D.J. Null*, **J.B. Cole**, M.V.G.B. da Silva, and P.J. Hansen. 2017. A single nucleotide polymorphism in *COQ9* affects mitochondrial and ovarian function, body

weight change after calving, and fertility in Holstein cows. *Biol. Reprod.* 96:652–663.

Parker Gaddis, K.L., S. Dikmen, **J.B. Cole**, and P.J. Hansen. 2017. Evaluation of genetic components in traits related to superovulation, in vitro fertilization, and embryo transfer in Holstein cattle. *J. Dairy Sci.* 100:2877–2891.

Porto-Neto, L.R., D.M. Bickhart, A.J. Landaeta-Hernandez, Y.T. Utsunomiya, M. Pagan, E. Jimenez, P.J. Hansen, S. Dikmen, S.G. Schroeder, E.-S. Kim, J. Sun, E. Crespo, N. Amati, **J.B. Cole**, D.J. Null, J.F. Garcia, A. Reverter, W. Barendse, and T.S. Sonstegard. 2017. Convergent evolution of slick coat in cattle through truncation mutations in the prolactin receptor. *Front. Livest. Genet.* 9:57.

Stafuzza, N.B., A. Zerlotini, F.P. Lobo, M.E.B. Yamagishi, M.E. Buzanskas, T.C.S. Chud, A.R. Caetano, D.P. Munari, D.J. Garrick, M.A. Machado, M.F. Martins, M.R. Carvalho, **J.B. Cole**, and M.V.G.B. da Silva. 2017. Identification of genetic variants with potential loss of function in Gyr, Girolando, and Guzerat cattle breeds by resequencing. *PLOS ONE* 12(3): e0173954.

Stafuzza, N.B., A. Zerlotini, F.P. Lobo, M.E.B. Yamagishi, T.C.S. Chud, A.R. Caetano, D.P. Munari, D.J. Garrick, M.A. Machado, M.F. Martins, M.R. Carvalho, **J.B. Cole**, and M.V.G.B. da Silva. 2017. Single nucleotide variants and indels identified from whole-genome resequencing of Guzerat, Gyr, and Girolando cattle breeds. *PLOS ONE* (Submitted.)

Thompson, N.M., N.O. Widmar, M.M. Schutz, **J.B. Cole**, and C.A. Wolf. 2017. Economic and social considerations of breeding for polled dairy cows versus dehorning. *J. Dairy Sci.* 100:4941–4952.

VanRaden, P.M., M.E. Tooker, J.R. O'Connell, D.M. Bickhart, and **J.B. Cole**. 2017. Selection of sequence variants to improve dairy cattle genomic predictions. *Genet. Sel. Evol.* 49:32.

Wiggans, G.R., **J.B. Cole**, S.M. Hubbard, and T.S. Sonstegard. 2017. Genomic selection in dairy cattle: the USDA experience. *Ann. Rev. Anim. Biosci.* 5:309-327.

Zhou, Y., B. Shen, J. Jiang, A. Padhi, K.-E. Park, B.P. Telugu, H. Chen, **J.B. Cole**, G.E. Liu, and L. Ma. 2017. Construction of *PRDM9* allele-specific recombination maps in cattle using large-scale pedigree analysis and genome-wide single sperm genomics. *DNA Res.* 25:183–194.

Bickhart, D.M., J.L. Hutchison, D.J. Null, P.M. VanRaden, and **J.B. Cole**. 2016. Reducing animal sequencing redundancy by preferentially

selecting animals with low-frequency haplotypes. *J. Dairy Sci.* 99: 5526–5534.

Bickhart, D.M., L. Xu, J.L. Hutchison, **J.B. Cole**, *D.J. Null*, S.G. Schroeder, J. Song, J.F. Garcia, T.S. Sonstegard, C.P. Van Tassell, R.D. Schnabel, J.F. Taylor, H.A. Lewin, and G.E. Liu. 2016. Diversity and population-genetic properties of copy number variations and multicopy genes in cattle. *DNA Res.* 3:253–262.

Cole, J.B., *D.J. Null*, and P.M. VanRaden. 2016. Phenotypic and genetic effects of recessive haplotypes on yield, longevity, and fertility. *J. Dairy Sci.* 99: 7274–7288.

Cole, J.B., and M.V.G.B. da Silva. 2016. Invited Review: Genomic selection in multi-breed dairy cattle populations. *Revista Brasil. Zootec.* 45:195–202.

García-Ruiz, A., **J.B. Cole**, P.M. VanRaden, G.R. Wiggans, F.J. Ruiz-López, and C.P. Van Tassell. 2016. Changes in genetic selection differentials and generation intervals in US Holstein dairy cattle as a result of genomic selection. *Proc. Natl. Acad. Sci. USA.* 113:E3995–4004.

Kaniyamattam, K., M.A. Elzo, **J.B. Cole**, and A. De Vries. 2016. A stochastic dynamic simulation model including multi-trait genetics to estimate genetic, technical and financial consequences of dairy farm reproduction and selection strategies. *J. Dairy Sci.* 99:8187–8202.

Ortega, M.S., A.C. Denicol, **J.B. Cole**, *D.J. Null*, and P.J. Hansen. 2016. Use of single nucleotide polymorphisms in candidate genes associated with daughter pregnancy rate for prediction of genetic merit for reproduction in Holstein cows. *Anim. Genet.* 47:288–297.

Parker Gaddis, K.L., **J.B. Cole**, J.S. Clay, and C. Maltecca. 2016. Benchmarking dairy herd health status using routinely recorded herd summary data. *J. Dairy Sci.* 99:1298–1314.

Parker Gaddis, K.L., *D.J. Null*, and **J.B. Cole**. 2016. Explorations in genome-wide association studies and network analyses with dairy cattle fertility traits. *J. Dairy Sci.* 99:6420–6435.

Pryce, J., *K. Parker Gaddis*, A. Koeck, C. Bastin, M. Abdelsayed, N. Gengler, F. Miglior, B. Heringstad, C. Egger-Danner, K. Stock, A. Bradley, and **J. Cole**. 2016. Invited Review: Opportunities for genetic improvement of metabolic diseases. *J. Dairy Sci.* 99:6856–6873.

Cole, J.B. 2015. A simple strategy for managing many recessive disorders in a dairy cattle breeding program. *Genet. Sel. Evol.* 47:94.

2015

2014

Dikmen, S., X. Wang, M.S. Ortega, **J.B. Cole**, D.J. Null, and P.J. Hansen. 2015. Single nucleotide polymorphisms associated with thermoregulation in lactating dairy cows exposed to heat stress. *J. Anim. Breed. Genet.* 132:409–419.

Ma, L., J.R. O'Connell, P.M. VanRaden, B. Shen, A. Padhi, C. Sun, D.M. Bickhart, **J.B. Cole**, D.J. Null, Y. Da, and G.R. Wiggans. 2015. Cattle sex-specific recombinations and their genetic control from a large pedigree analysis. *PLOS Genet.* 11:e1005387.

Parker Gaddis, K.L., F. Tiezzi, **J.B. Cole**, J.S. Clay, and C. Maltecca. 2015. Genomic prediction of disease occurrence using producer-recorded health data: A comparison of methods. *Genet. Sel. Evol.* 47:41.

Tiezzi, F., K.L. *Parker Gaddis*, **J.B. Cole**, J.S. Clay, and C. Maltecca. 2015. A genome-wide association study for clinical mastitis in first parity US Holstein cows using single-step approach and genomic matrix re-weighting procedure. *PLoS ONE* 10:e0114919.

Zavarez, L.B., Y.T. Utsunomiya, A.S. Carmo, H.H.R. Neves, R. Carneiro, M. Ferenčaković, A.M. Pérez O'Brien, I. Curik, **J.B. Cole**, C.P. Van Tassell, M.V.G.B. da Silva, T.S. Sonstegard, J. Sölkner, and J.F. Garcia. 2015. Assessment of autozygosity in Nelore cows (*Bos indicus*) through high-density SNP genotypes. *Front. Livest. Gen.* 6(5):1–8.

Cole, J.B., B. Waurich, M. Wensch-Dorendorf, D.M. Bickhart, and H.H. Swalve. 2014. A genome-wide association study of calf birth weight in Holstein cattle using single nucleotide polymorphisms and phenotypes predicted from auxiliary traits. *J. Dairy Sci.* 97:3156–3172.

Cooper, T.A., G.R. Wiggans, D.J. Null, J.L. Hutchison, and **J.B. Cole**. 2014. Genomic evaluation, breed identification, and discovery of a haplotype affecting fertility for Ayrshire dairy cattle. *J. Dairy Sci.* 97:3878–3882.

da Silva, M.V.G.B., D.J.A. dos Santos, S.A. Boison, A.T.H. Utsunomiya, A.S. do Carmo, T.S. Sonstegard, **J.B. Cole**, and C.P. Van Tassell. 2014. The development of genomics applied to dairy breeding. *Livest. Sci.* 166:66–75.

Egger-Danner, C., **J.B. Cole**, J. Pryce, N. Gengler, B. Heringstad, A. Bradley, L. Andrews, and K.F. Stock. 2014. Invited review: overview of new traits and phenotyping strategies in dairy cattle with a focus on functional traits. *Animal* 9:191–207.

Gay, K.D., N.J. Widmar, T.D. Nennich, A.P. Schinckel, **J.B. Cole**, and M.M. Schutz. 2014. Development of a lifetime merit-based selection index for US dairy grazing systems. *J. Dairy Sci.* 97:4568–4578.

- Hutchison, J.L., **J.B. Cole**, and D.M. Bickhart. 2014. Short Communication: Use of young bulls in the United States. *J. Dairy Sci.* 97:3213–3220.
- Macciotta, N.P.P., C. Dimauro, D.J. Null, G. Gaspa, M. Cellesi, and **J.B. Cole**. 2014. Dissection of genomic correlation matrices of US Holsteins using multivariate factor analysis. *J. Anim. Breed. Genet.* 132:9–20.
- McClure, M.C., D.M. Bickhart, D.J. Null, P.M. VanRaden, L. Xu, G.R. Wiggans, G. Liu, S.G. Schroeder, J. Glasscock, J. Armstrong, **J.B. Cole**, T.S. Sonstegard, and C. P. Van Tassell. 2014. Bovine exome sequence analysis and targeted SNP genotyping of recessive fertility defects HH2, HH3, and BH1 reveals causative mutation in SMC2 for HH3. *PLoS ONE* 9:e92769.
- McDanel, T.G., L.A. Kuehn, M.G. Thomas, W.M. Snelling, T.P.L. Smith, E.J. Pollak, **J.B. Cole**, and J.W. Keele. 2014. Genome-wide association study of reproductive efficiency in female cattle. *J. Anim. Sci.* 92:1945–1957.
- Neves, H.H.R., R. Carneiro, A.M. Pérez O’Brien, Y.T. Utsunomiya, A.S. do Carmo, F.S. Schenkel, J. Sölkner, J.C. McEwan, C.P. Van Tassell, T.S. Sonstegard, **J.B. Cole**, M.V.G.B. da Silva, S.A. Queiroz, and J.F. Garcia. 2014. Accuracy of genomic predictions in *Bos indicus* (Nellore) cattle. *Genet. Sel. Evol.* 46:17.
- Parker Gaddis, K.L., **J.B. Cole**, J.S. Clay, and C. Maltecca. 2014. Genomic selection for producer-recorded health event data in U.S. dairy cattle. *J. Dairy Sci.* 97:3190–3199.
- Sun, C., P.M. VanRaden, **J.B. Cole**, and J.R. O’Connell. 2014. Improvement of prediction ability for genomic selection of dairy cattle by including dominance effects. *PLoS ONE* 9(8):e103934.
- Utsunomiya, Y.T., A.S. do Carmo, H.H.R. Neves, R. Carneiro, L.B. Zavarez, P.K.R.K. Ito, A.M. Pérez O’Brien, J. Sölkner, L.R. Porto Neto, F.S. Schenkel, J. McEwan, **J.B. Cole**, M.V.G.B. da Silva, C.P. Van Tassell, T.S. Sonstegard, and J.F. Garcia. 2014. Genome-wide scan identifies putative genetic variants and genes associated with scrotal circumference in Nellore cattle. *PLoS ONE* 9(2):e88561.
- Weller, J.I., J.B. Cole, P.M. VanRaden, and G.R. Wiggans. 2014. Application of the *a posteriori* granddaughter design to the Holstein genome. *Animal* 8:511–519.
- Xu, L., D.M. Bickhart, **J.B. Cole**, P.M. VanRaden, J. Song, T.S. Sonstegard, C.P. Van Tassell, and G.E. Liu. 2014. Genomic signatures reveal new evidences for selection of important traits in domestic cattle. *Mol. Biol. Evol.* 32: 711–725.

2013

Xu, L., **J.B. Cole**, Y. Hou, D.M. Bickhart, J. Song, P.M. VanRaden, T.S. Sonstegard, C.P. Van Tassell, and G.E. Liu. 2014. Genome wide CNV analysis reveals additional variants associated with milk production traits in Holsteins. *BMC Genomics* 15:683–692.

Yao, C., K.A. Weigel, and **J.B. Cole**. 2014. Short Communication: Genetic evaluation of stillbirth in US Brown Swiss and Jersey cattle. *J. Dairy Sci.* 97:2474–2480.

Cochran, S.J., **J.B. Cole**, *D.J. Null*, and P.J. Hansen. 2013. Discovery of single nucleotide polymorphisms in candidate genes associated with fertility and production traits in Holstein cattle. *BMC Genetics* 14:49–71.

Cochran, S.J., **J.B. Cole**, *D.J. Null*, and P.J. Hansen. 2013. Single nucleotide polymorphisms in candidate genes associated with fertilizing ability of sperm and subsequent embryonic development in cattle. *Biol. Reprod.* 69:1–7.

Cole, J.B., R.M. Lewis, C. Maltecca, S. Newman, K.M. Olson, and R.G. Tait, Jr. 2013. Systems Biology in Animal Breeding: Identifying relationships among markers, genes, and phenotypes. *J. Anim. Sci.* 91:521–522.

Cole, J.B., and *D.J. Null*. 2013. Visualization of the transmission of direct genomic values for paternal and maternal chromosomes for fifteen traits in U.S. Brown Swiss, Holstein, and Jersey cattle. *J. Dairy Sci.* 96:2713–2726.

Dikmen, S., **J.B. Cole**, *D.J. Null*, and P.J. Hansen. 2013. Genome-wide association mapping for identification of quantitative trait loci for rectal temperature during heat stress in Holstein cattle. *PLoS ONE* 8:e69202.

Hutchison, J.L., P.M. VanRaden, H.D. Norman, and **J.B. Cole**. 2013. Technical Note: Changes to herd cutoff date in conception rate evaluations. *J. Dairy Sci.* 96:1264–1268.

Kim, E.-S., **J.B. Cole**, H. Huson, G.R. Wiggans, C.P. Van Tassell, B.A. Crooker, Y. Da, and T.S. Sonstegard. 2013. Effect of artificial selection on runs of homozygosity in U.S. Holstein cattle. *PLoS ONE* 8:e80813.

McClure, M.C., E.-S. Kim, D. Bickhart, *D.J. Null*, T.A. Cooper, **J.B. Cole**, G.R. Wiggans, P.A. Marsan, L. Colli, E. Santus, G. Liu, S.G. Schroeder, L.K. Matukumalli, C.P. Van Tassell, and T.S. Sonstegard. 2013. Fine mapping for Weaver Syndrome in the Brown Swiss breed with the identification of possible causal mutations across NRCAM, PNPLA8 and CTTNBP2 and development of a diagnostic SNP haplotype. *PLoS ONE* 8:e59251.

Sonstegard, T.S., **J.B. Cole**, P.M. VanRaden, C.P. Van Tassell, *D.J. Null*, S.G. Schroeder, D. Bickhart, and M.C. McClure. 2013. Identification of a

nonsense mutation in CWC15 associated with decreased reproductive efficiency in Jersey cattle. PLoS ONE 8:e54872.

Utsunomiya, Y.T., A.S. do Carmo, R. Carvalheiro, H.H.R. Neves, M.C. Matos, L.B. Zavarez, A.M. Pérez O'Brien, J. Sölkner, J. McEwan, **J.B. Cole**, C.P. Van Tassell, F.S. Schenkel, M.V.G.B. da Silva, L.R. Porto Neto, T.S. Sonstegard, and J. Fernando Garcia. 2013. Genome-wide association study for birth weight in Brazilian Nellore cattle (*Bos taurus indicus*) points to previously described orthologous genes affecting human and bovine height. BMC Genet. 14:52–63.

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2012

Cole, J.B., J.L. Ehrlich, and *D.J. Null*. 2012. Short communication: Projecting milk yield using best prediction and the MilkBot lactation model. J. Dairy Sci. 95:4041–4044.

Cole, J. B., S. Newman, F. Foertter, I. Aguilar, and M. Coffey. 2012. Really big data: processing and analysis of large datasets. J. Anim. Sci. 90:723–733.

Dikmen, S., **J.B. Cole**, *D.J. Null*, and P.J. Hansen. 2012. Heritability of rectal temperature and genetic correlations with production and reproduction traits in dairy cattle. J. Dairy Sci. 95:3401–3405.

Ma, L., G.R. Wiggans, S. Wang, T.S. Sonstegard, J. Yang, B.A. Crooker, **J.B. Cole**, C.P. Van Tassell, and Y. Da. 2012. Effect of sample stratification on dairy GWAS results. BMC Genomics 13:536–553.

Parker Gaddis, K.L., **J.B. Cole**, J.S. Clay, and C. Maltecca. 2012. Incidence validation and causal relationship analysis of producer-recorded health event data from on-farm computer systems in the U.S. J. Dairy Sci. 95:5422–5435.

2011

Cole, J.B., *D.J. Null*, and A. de Vries. 2011. Short communication: Best prediction of 305-day lactation yields with regional and seasonal effects. J. Dairy Sci. 94:1601–1604.

Cole, J.B., and P.M. VanRaden. 2011. Use of haplotypes to estimate Mendelian sampling effects and selection limits. J. Anim. Breed. Genet. 128:446–455.

Cole, J.B., G.R. Wiggans, L. Ma, T.S. Sonstegard, T.J. Lawlor, Jr., B.A. Crooker, C.P. Van Tassell, J. Yang, S. Wang, L.K. Matukumalli, and Y. Da.

2011. Genome-wide association analysis of thirty-one production, health, reproduction and body conformation traits in contemporary U.S. Holstein cows. *BMC Genomics* 12:408–424.
- VanRaden, P.M., K.M. Olson, G.R. Wiggans, **J.B. Cole**, and M.E. Tooker. 2011. Genomic inbreeding and relationships among Holsteins, Jerseys, and Brown Swiss. *J. Dairy Sci.* 94:5673–5680.
- Wiggans, G.R., T.A. Cooper, P.M. VanRaden, and **J.B. Cole**. 2011. Technical note: Adjustment of traditional cow evaluations to improve accuracy of genomic predictions. *J. Dairy Sci.* 94:6188–6193.
- 2010 Attalla, S.A., A.J. Seykora, **J.B. Cole**, and B.J. Heins. 2010. Genetic parameters of milk ELISA scores for Johne's disease. *J. Dairy Sci.* 93:1729–1735.
- Cole, J.B.**, and P.M. VanRaden. 2010. Visualization of results from genomic evaluations. *J. Dairy Sci.* 93:2727–2740.
- 2009 Appuhamy, J.A.D.R.N., B.G. Cassell, and **J.B. Cole**. 2009. Phenotypic and genetic relationships of common health disorders with milk and fat yield persistencies from producer-recorded health data and test-day yields. *J. Dairy Sci.* 92:1785–1795.
- Cole, J.B.**, and D.J. Null. 2009. Genetic evaluation of lactation persistency for five breeds of dairy cattle. *J. Dairy Sci.* 92:2248–2258.
- Cole, J.B.**, D.J. Null, and P.M. VanRaden. 2009. Best prediction of yields for long lactations. *J. Dairy Sci.* 92:1796–1810.
- Cole, J.B.**, P.M. VanRaden, J.R. O'Connell, C.P. Van Tassell, T.S. Sonstegard, R.D. Schnabel, J.F. Taylor, and G.R. Wiggans. 2009. Distribution and location of genetic effects for dairy traits. *J. Dairy Sci.* 92:2931–2946.
- Miller, R.H., Jr., H.D. Norman, J.R. Wright, and **J.B. Cole**. 2009. Impact of genetic merit for milk somatic cell score of sires and maternal grandsires on herd life of their daughters. *J. Dairy Sci.* 92:2224–2228.
- Norman, H.D., J.R. Wright, M.T. Kuhn, S.M. Hubbard, **J.B. Cole**, and P.M. VanRaden. 2009. Genetic and environmental factors that impact gestation length. *J. Dairy Sci.* 92:2259–2269.
- 2008 Wiggans, G.R., **J.B. Cole**, and L.L.M. Thornton. 2008. Multiparity evaluation of calving ease and stillbirth with separate genetic effects by parity. *J. Dairy Sci.* 91:3173–3178.
- 2007 Appuhamy, J.A.D.R.N., B.G. Cassell, C.D. Dechow, and **J.B. Cole**. 2007. Phenotypic relationships of common health disorders in dairy cows to

lactation persistency estimated from daily milk weights. *J. Dairy Sci.* 90:4424–4434.

Bohmanova, J., I. Misztal, and **J.B. Cole**. 2007. Comparison of seven temperature humidity indices as indicators of milk production losses due to heat stress in semi-arid and humid climates. *J. Dairy Sci.* 90:1947–1956.

Cole, J.B. 2007. PyPedal: A package for pedigree analysis using the Python programming language. *Comp. Electron. Agric.* 57:107–113.

Cole, J.B., G.R. Wiggans, and P.M. VanRaden. 2007. Genetic evaluation of stillbirth in United States Holsteins using a sire-maternal grandsire threshold model. *J. Dairy Sci.* 90:2480–2488.

Cole, J.B., G.R. Wiggans, P.M. VanRaden, and R.H. Miller, Jr. 2007. Stillbirth (co)variance components for a sire-maternal grandsire threshold model and development of a calving ability index for sire selection. *J. Dairy Sci.* 90:2489–2496.

VanRaden, P.M., M.E. Tooker, **J.B. Cole**, G.R. Wiggans, and J.H. Megonigal, Jr. 2007. Genetic evaluations for mixed breed populations. *J. Dairy Sci.* 90:2434–2441.

2006 **Cole, J.B.**, and P.M. VanRaden. 2006. Genetic evaluation and best prediction of lactation persistency. *J. Dairy Sci.* 89:2722–2728.

2005 **Cole, J.B.**, R.C. Goodling, Jr., G.R. Wiggans, and P.M. VanRaden. 2005. Genetic evaluation of calving ease for Brown Swiss and Jersey bulls from purebred and crossbred calvings. *J. Dairy Sci.* 88:1529–1539.

2004 **Cole, J.B.**, D.E. Franke, and E.A. Leighton. 2004. Population genetic structure of a colony of German Shepherd and Labrador Retriever dog guides. *J. Anim. Sci.* 82:2906–2912.

Rohli, R.V., M.M. Russo, A.J. Vega, and **J.B. Cole**. 2004. Atmospheric and statewide anomalously-high tropospheric ozone concentrations in Louisiana. *J. Appl. Meteorol.* 43:1438–1451.

1999 Hansen, L.B., **J.B. Cole**, G.D. Marx, and A.J. Seykora. 1999. Productive life and reasons for disposal of Holstein cows selected for large versus small body size. *J. Dairy Sci.* 82:795–801.

Grants Received

2019 Minnesota Agricultural Experiment Station Rapid Agricultural Response Fund grant “Reducing Mastitis in the Dairy Cow by Increasing the Prevalence of Beneficial Polymorphisms in Genes Associated with

- Mastitis Resistance” for \$233,324 (Crooker et al.; 07/01/2019–06/30/2021)
- 2018 NIH and USDA-NIFA Dual Purpose R01 grant “Physiological and Genetic Insights into Pregnancy Loss” for \$1,851,398 (Accession #: 4097656; T.E. Spencer et al.; 07/01/2018–06/30/2023)
- 2017 AFRI Competitive Grant “Moving Livestock Research Forward” for \$50,000 (Grant #: 2017-67015-26907; Reecy et al.; 08/15/2017–08/14/2019)
- 2016 AFRI Foundational grant “Sequence-Based Big Data Genomic Discovery and Application to Improve Dairy Fertility” for \$350,000 (Grant #: 2016-67015-24886; L. Ma, et al.; 02/15/2016–02/14/2019)
- 2014 Conselho Nacional de Desenvolvimento Científico e Tecnológico “Ciências sem Fronteiras” grant “Genomic Selection for Dairy Cattle in Brazil” for \$174,000 (Grant #: 301025/2014-2; M.V.G.B. da Silva and J.B. Cole; 2014–2017)
- NSF grant “ABI Innovation: An Integrative Approach to Identifying Highly Heritable Subtypes of Complex Phenotypes” for \$585,717 (Grant #: 1356655; J. Bi et al.; 07/02/2014–04/01/2016)
- 2013 AFRI Integrated grant “Improving Fertility of Dairy Cattle Using Translational Genomics” for \$3,000,000 (Grant #: 2013-68004-20365; T.E. Spencer, et al.; 01/01/2013–12/31/2015)
- 2011 Southeast Milk, Inc. Milk Checkoff Program grant “Development of tools to select cattle that are genetically resistant to heat stress” for \$18,000 (P.J. Hansen, S. Dikmen, and J.B. Cole, 7/1/2011–6/30/2012)
- 2010 AFRI Integrated grant “Improving Fertility During Heat Stress in Lactating Dairy Cows” for \$1,000,000 (Grant #: 2010-85122-20623; P.J. Hansen et al.; 03/01/2010–02/28/2014)
- 2008 NRI grant “Genome Signature of Artificial Selection and Genome-Wide Association Analysis in Holstein Cows” for \$450,000 (Grant #: 2008-35205-18846; Y. Da et al.; 04/01/2008–08/31/2010)
- 2001 The Seeing Eye, Inc. grant “Genetic Analysis in a Colony of Guide Dogs” for \$500 (J.B. Cole; 2001-2002)

Book Chapters and Technical Reports

- 2019 **Cole, J.B.** 2019. Chapter 13 - Advances in Dairy Cattle Breeding to Improve Resistance to Mastitis. In *Advances in Breeding of Dairy Cattle*.

- J. van der Werf and J. Pryce, ed. Burleigh Dodds Science Publishing Limited, Cambridge, UK. (Submitted.)
- 2018 **Cole, J.B.**, P.M. VanRaden, D.J. Null, J.L. Hutchison, and S.M. Hubbard. 2018. AIP Research Report Genomic4: Haplotype tests for economically important traits of dairy cattle. Available: https://aipl.arsusda.gov/reference/haplotypes_ARR-G4.html.
- VanRaden, P.M., **J.B. Cole**, and K.L. Parker Gaddis. 2018. AIP Research Report NM\$7: Net merit as a measure of lifetime profit: 2018 revision. Available: <https://aipl.arsusda.gov/reference/nmcalc-2018.htm>.
- 2017 **Cole, J.B.**, and D.M. Spurlock. 2017. Improving Production Efficiency through Genetic Selection. In Large Dairy Herd Management, 3rd Edition. D. Beede et al., ed. American Dairy Science Association, Champaign, IL. Available: <https://ldhm.adsa.org/>.
- 2014 **Cole, J.B.** 2014. Use of Gene Markers for Genetic Selection of Dairy Cattle. Encyclopedia of Biotechnology in Agriculture and Food, Taylor & Francis, Florence, KY. Published online May 7, 2014.
- ICAR Functional Traits Working Group (Andrews, L., Bradley, A.J., **Cole, J.B.**, Egger-Danner, C., Gengler, N., Heringstad, B., Pryce, J., Stock, K., and Strandberg, E.). 2014. Section 7.1 – Guidelines for recording, evaluation and genetic improvement of health traits. ICAR Recording Guidelines. pp. 235–261. Int. Comm. Anim. Recording, Rome, Italy.
- ICAR Functional Traits Working Group (Andrews, L., Bradley, A.J., **Cole, J.B.**, Egger-Danner, C., Gengler, N., Heringstad, B., Pryce, J., Stock, K., and Strandberg, E.). 2014. Section 7.2 – Guidelines for recording, evaluation and genetic improvement of female fertility in dairy cattle. ICAR Recording Guidelines. pp. 262–278. Int. Comm. Anim. Recording, Rome, Italy.
- VanRaden, P.M., M.E. Tooker, J.R. Wright, **J.B. Cole**, *D.J. Null*, and T.J. Lawlor. 2014. AIP Research Report BASE3: Genetic base changes for December 2014. Available: <http://aipl.arsusda.gov/reference/base2014.htm>.
- VanRaden, P.M., and **J.B. Cole**. 2014. AIP Research Report NM\$5: Net merit as a measure of lifetime profit: 2014 revision. Available: <http://aipl.arsusda.gov/reference/nmcalc-2014.htm>.
- 2013 **Cole, J.B.**, P.M. VanRaden, *D.J. Null*, J.L. Hutchison, and T.A. Cooper. 2013. AIPL Research Report GENOMIC3: Haplotype tests for recessive disorders that affect fertility and other traits. Available: http://aipl.arsusda.gov/reference/recessive_haplotypes_ARR-G3.html.

- Egger-Danner, C., O.K. Hansen, K. Stock, J. Pryce, **J. Cole**, N. Gengler, and B. Heringstad (ed.). 2013. ICAR Technical Series no. 17: Challenges and benefits of health data recording in the context of food chain quality, management and breeding. ICAR Tech. Ser. No. 17. ICAR, Rome, Italy.
- 2012 **Cole, J.B.**, and *D.J. Null*. 2012. AIPL Research Report GENOMIC2: Use of chromosomal predicted transmitting abilities. Available: http://aipl.arsusda.gov/reference/chromosomal_pta_query.html.
- 2011 De Vries, A., **J.B. Cole**, and D.T. Galligan. 2011. Economics of reproduction: the quality of the pregnancy. 2011 Dairy Cattle Reproduction Conference, Kansas City, MO, pp. 90–97.
- De Vries, A., D.T. Galligan, and **J.B. Cole**. 2011. Some ideas on the use and economic value of the 3K SNP genomic test for calves on dairy farms. Florida Cooperative Extension Publication AN270. Available: <http://edis.ifas.ufl.edu/an270>.
- 2010 Cooper, T.A., M.E. Tooker, P.M. VanRaden, G.R. Wiggans, and **J.B. Cole**. 2010. AIPL Research Report GENOMIC1: Imputation of Cow Genotypes and Adjustment of PTAs. Available: <http://aipl.arsusda.gov/reference/changes/aprilinformation.htm>.
- VanRaden, P.M., **J.B. Cole**, M.E. Tooker, and T.A. Cooper. 2010. AIPL Research Report BASE2: Genetic base changes for January 2010. Available: <http://aipl.arsusda.gov/reference/base2010.htm>.
- 2009 **Cole, J.B.**, P.M. VanRaden, and Multi-State Project S-1040. 2009. AIPL Research Report NM\$4: Net merit as a measure of lifetime profit: 2010 revision. Available: <http://aipl.arsusda.gov/reference/nmcalc-2010.htm>.
- De Vries, A., and **J.B. Cole**. 2009. Profitable dairy cow traits for hot climatic conditions. Pages 227–248 in Breeding for robustness in cattle – EAAP 126. M. Klopčič, R. Reents, J. Philipsson, and A. Kuipers, ed. Wageningen Academic Publishers, Wageningen, The Netherlands.
- 2007 **Cole, J.B.** 2007. AIPL Research Report SB1: Genetic evaluation of stillbirth. Available: <http://aipl.arsusda.gov/reference/fertility/sb2006.html>.
- VanRaden, P.M., M.E. Tooker, G.R. Wiggans, **J.B. Cole**, and J.H. Magonigal, Jr. 2007. AIPL Research Report AB1: All-breed evaluation. Available: <http://aipl.arsusda.gov/reference/all-breed-2007.htm>.
- 2005 **Cole, J.B.** 2005. AIPL Research Report CE1: Brown Swiss and Holstein calving ease. Available: <http://aipl.arsusda.gov/reference/fertility/ce2005.htm>.

2004 Lanting, F.L., and **J.B. Cole**. 2004. Chapter 13: Basics of Genetics. Pages 256–290 in *The Total German Shepherd Dog*, 2nd ed. Hoflin Publishing, Wheat Ridge, CO.

Popular Press Articles

- 2015 **Cole, J.B.** 2015. Data collection should be as simple as needed, and no more. *Dairy Herd Management*. (Submitted.)
- Cole, J.B.** 2015. Feedback: Calving outcomes on dairy farms: We've been collecting data for decades. *Dairy Herd Manage.*, Jan. 21, (Also published as *Dairy Herd Manage. Daily*, Thurs., Jan. 22, online; We've been collecting data for decades [excerpt as letter to editor], *Dairy Herd Manage.* 52(2):6) Available: <http://www.dairyherd.com/news/feedback-calving-outcomes-dairy-farms-weve-been-collecting-data-decades>.
- 2014 **Cole, J.B.** 2014. We need your help to breed healthier dairy cows! *DairyBusiness West*. 95(8):10. Available: <http://magazines.dairybusiness.com/dbwaug14/html5/>.
- Norman, H.D., P. VanRaden, **J. Cole**, and J. Dürr. 2014. Revisions to lifetime merit indexes will be incorporated in the December 2014 evaluations. Council on Dairy Cattle Breeding, Bowie, MD. (Also published as Director's Comments, *Ayrshire Digest* 100(6):4).
- 2013 Parker Gaddis, K.L., C. Maltecca, and **J.B. Cole**. 2013. Genetic improvement of health and fitness traits. *Hoard's Dairyman*. 158(12):455.
- Parker Gaddis, K.L., C. Maltecca, and **J.B. Cole**. 2013. Verso il successo nella selezione per la salute della vacca [In Italian]. *Bianconero* (accepted.)
- 2011 De Vries, A., D.T. Galligan, and **J.B. Cole**. 2011. Some ideas on the use and economic value of the 3K SNP genomic test for calves on dairy farms. *Dairy Update* 11(3):5–9. Available: <http://dairy.ifas.ufl.edu/dairyupdate/DairyUpdateSummer2011.pdf>.
- 2009 De Vries, A., D.T. Galligan, and **J.B. Cole**. 2011. Some ideas on the use and economic value of the 3K SNP genomic test for calves on dairy farms. *Dairy Update* 11(3):5-9.
- 2006 **Cole, J.B.** 2009. Using Python to study pedigrees with PyPedal. *Python Magazine* 3:12–20.
- Cole, J.B.**, R.C. Goodling, Jr., G.R. Wiggans, and P.M. VanRaden. 2006. Genetic calving ease study on crossbreeds. *Jersey Journal* 53(5):83–84.

- Seykora, A.J., P.M. VanRaden, and **J.B. Cole**. 2006. Net Merit receives face-lift. *Hoard's Dairyman* 151(14):557.
- 2005 **Cole, J.B.** 2005. How can we genetically improve dairy cattle health? *The Dairy Focus* 6(4):3.

Software Packages

- 2017 **gene-editing**: Programs for simulation of strategies for managing multiple recessives in a dairy cattle population using gene editing. Website: <https://github.com/wintermind/gene-editing>.
- 2014 **multiple-recessives**: Programs for simulation of strategies for managing multiple recessives in a dairy cattle population. Website: <https://github.com/wintermind/multiple-recessives>.
- 2010 **PyPedal**: A package for pedigree analysis using the Python programming language, v. 2.0.0. Website: <http://pypedal.sourceforge.net/>.
- 2007 **BESTPRED**: A Program for Estimation of Lactation Yield and Persistency Using Best Prediction. Website: <http://www.aipl.arsusda.gov/software/bestpred/>.

Invited Presentations

- 2019 *May*. Future of genomic evaluations of Holstein cattle. Foro Nacional Holstein (FONAHolstein), Querétaro, México.
- April*. Biotechnology and the progress of dairy production. Great Challenges to Science Workshop: How biotechnology can vanish world hunger (Como a biotecnologia pode acabar com a fome no mundo), Universidade de São Paulo, Pirassununga, Brazil.
- March*. Emerging technologies in dairy cow improvement programs & 2019 AGIL-AIP update, National DHIA Annual Meeting, San Diego, CA.
- January*. Benefits from adoption of a new reference genome assembly and use of a larger SNP set in genomic predictions for US dairy cattle. XXVII Plant & Animal Genome Conference, San Diego, CA. (Canceled due to government shutdown.)
- 2018 *October*. Strategies for managing genetic disorders in dairy cattle. Department of Animal and Avian Sciences, University of Maryland, College Park, MD.

2017

July. Landscape of breeding in food and agriculture - from conventional to gene editing, Responsible Use of Gene Editing Steering Committee Meeting, Center for Food Integrity, Arlington, VA.

June. Possibilities in an age of genomics. The future of the breeding index, 21st International Conference of the World Jersey Cattle Bureau, Columbus, OH.

October. How selection for better health impacts dairy profitability, National Dairy Herd Information Association Board Meeting, Rosemont, IL.

October. How selection for better health impacts dairy profitability, DHI-Provo Herd & Feed Management Conference, Las Vegas, NV.

October. The science of feeding 9 billion people. Connections Weekend, Louisiana School for Math, Science, and the Arts, Natchitoches, LA.

October. Management of Mendelian traits in breeding programs by gene editing, Department of Animal Science, University of Wisconsin, Madison.

October. How selection for better health impacts dairy profitability, Council on Dairy Cattle Breeding Industry Meeting: Discover New Dairy Genetics, Madison, WI.

June. Possibilities in an age of genomics. The future of the breeding index in the ADSA Multidisciplinary and International Leadership Keynote (MILK) Symposium: The dairy cow in 50 years. ADSA, Pittsburgh, PA.

May. Improving production efficiency through genetic selection, Genetic improvement programs for U.S. dairy cattle, The role of phenotyping in dairy cattle improvement in the genomic era, and Genomic selection for traits other than production in dairy cattle, Symposium on Genetic and Genomic Selection in Dairy Cattle, St. Petersburg, Russia.

March. 2017 AGIL-AIP update, National DHIA Annual Meeting, Savannah, GA.

February. Managing recessive disorders in breeding programs by gene editing, Faculdade de Zootecnia e Engenharia de Alimentos, Universidade de São Paulo, Pirassununga, SP, Brasil.

2016

October. Updated guidelines for the recording, evaluation, and genetic improvement of udder health in dairy cattle. ICAR, Puerto Vargas, Chile.

May. The role of phenotyping in dairy cattle improvement in the genomic era, Department of Dairy Science, University of Wisconsin, Madison.

- May.* Improving production efficiency through genetic selection. Large Dairy Herd Management Conference, Oak Brook, IL.
- March.* What direction should US dairy research take in the future? 51st National DHIA Annual Meeting, Orlando, FL.
- 2015 *July.* Genomic selection in multiple-breed cattle populations. 52^a Reunião Anual da Sociedade Brasileira de Zootecnia, Belo Horizonte, Brasil.
- May.* Genomic selection for traits other than production in dairy cattle. XX ANEMBE International Congress, Burgos, Spain.
- May.* What should you expect from genomic selection? XX ANEMBE International Congress, Burgos, Spain.
- April.* Using genotypes to construct phenotypes for dairy cattle breeding programs and beyond. Final OptiMIR Scientific and Expert Meeting, Namur, Belgium.
- March.* If we would see further than others: research & technology today and tomorrow. 50th National DHIA Annual Meeting, Columbus, OH.
- 2014 *September.* Genetic improvement programs for US dairy cattle. Embrapa Gado de Leite, Juiz de Fora, MG, Brasil.
- September.* Using genotyping and whole-genome sequencing to identify causal variants associated with complex phenotypes. Universidade Federal de Viçosa, Viçosa, MG, Brasil.
- August.* The hunt for a functional mutation affecting conformation and calving traits on chromosome 18 in Holstein cattle. 10th World Congress on Genetics Applied to Livestock Production, Vancouver, BC, Canada.
- May.* Phenotypes for novel functional traits of dairy cattle. International Committee for Animal Recording, Berlin, Germany.
- March.* Health and fitness data – what might be possible for dairy cattle? and AIPL Update National DHIA Annual Meeting, St. Louis, MO.
- 2013 *October.* Opportunities for research on applied livestock genomics. Department of Animal Sciences, Purdue University, West Lafayette, IN.
- September.* Genomic evaluation of low-heritability traits: dairy cattle health as a model. 5th International Symposium on Animal Functional Genomics, Guarujá, SP, Brazil.
- May.* Genomic evaluation of dairy cattle health. ICAR 2013 Health Data Conference, Aarhus, Denmark.

- 2012
- May.* Use of NGS to identify the causal variant associated with a complex phenotype. Wageningen University and Research Center, the Netherlands.
 - May.* Genomic selection and systems biology – lessons from dairy cattle breeding. KeyGene nv, Wageningen, the Netherlands.
 - March.* Opportunities for genetic improvement of health and fitness traits. 2013 National DHIA Annual Meeting, St. Pete Beach, Florida.
 - February.* The use and economic value of genomic testing for calves on dairy farms. ANAFI Genomics Workshop, Cremona, Italy.
 - November.* Genomic selection – dairy cattle successes and challenges. National Swine Improvement Federation, Kansas City, MO.
 - August.* Applications of haplotypes in dairy farm management. 63rd EAAP Meeting, Bratislava, Slovak Republic.
 - May.* Use of dense SNP chips for gene discovery. 16th QTL-MAS Workshop, Alghero, Italy.
 - May.* The U.S. genetic evaluation system. Department of Animal Sciences, University of Sassari, Sardinia, Italy.
 - May.* New tools for genomic selection of livestock. Department of Animal Sciences, University of Sassari, Sardinia, Italy.
 - April.* New tools for genomic selection of livestock. Department of Animal Science, North Carolina State University, Raleigh.
 - March.* March 2012 AIPL update. Select Sires Holstein Sire Evaluation Committee, Columbus, OH.
 - February.* Genomics beyond EBVs. 2nd International Workshop on Genomics Applied to Livestock, Araçatuba, SP, Brazil.
- 2011
- July.* Data structures and visualization. 2011 ADSA/ASAS Joint Annual Meeting, New Orleans, LA.
- 2010
- November.* What can we do with dairy cattle genomics other than predict more accurate breeding values? Department of Animal Science, North Carolina State University, Raleigh.
 - November.* Age at first calving in Holstein cattle in the United States. Dairy Cattle Reproduction Council, St. Paul, MN.
- 2009
- November.* Biological insights from the implementation of a genomic selection program in dairy cattle. Institute of Genetics, Vetsuisse Faculty, University of Berne, Switzerland.

- November.* Identifying markers associated with thermal tolerance. 18th DISCOVER Conference on Food Animal Agriculture: Effect of the Thermal Environment on Nutrient and Management Requirements of Cattle, Nashville, IN. (Declined due to prior commitments.)
- October.* Visualization of results from genomic evaluation. Department of Animal Sciences, Colorado State University, Fort Collins.
- March.* Distribution and location of genetic effects for dairy traits. CRI Genomics Emerging Markets Program, Washington, D.C.
- 2008 *June.* Best predictions of daily and lactation yields and data collection ratings. International Committee for Animal Recording, Niagara Falls, NY.
- 2007 *September.* Best prediction of actual lactation yields. AgriTech Analytics & Holstein Association USA Dairy Industry Event, Visalia, CA.
- September.* Overview of Animal Improvement Programs Laboratory. Department of Animal Sciences, Louisiana State University, Baton Rouge.
- September.* Genetic evaluation of calving traits in U.S. Holsteins. Department of Animal Sciences, Louisiana State University, Baton Rouge.
- June.* Validation of producer-recorded health event data and use in genetic improvement of dairy cattle. Department of Animal Sciences, University of Florida, Gainesville.
- 2006 *October.* Genetic evaluation of calving traits in U.S. Holsteins. Breeding and Genetics group, Department of Animal Sciences, Colorado State University, Fort Collins.
- October.* Dairy cattle breeding in the United States. Department of Animal Sciences, Colorado State University, Fort Collins.
- February.* Genetic evaluation of calving traits. Department of Animal and Dairy Science, University of Georgia, Athens.
- 2003 *August.* Genetics applied to the working dog. International Seppala Siberian Sleddog Club Annual Meeting, Seeley Lake, MT.

University Teaching Experience

- January 2001–
May 2001 **Instructor**, Department of Dairy Science, Louisiana State University, Baton Rouge, LA. *Taught sophomore-level introductory genetics course to 70 undergraduates; scored above the College of Agriculture average on the end-of-semester Student Perception of Teaching evaluation.*
- Summer 1998 &
1999 **Seminar Coordinator**, Life Sciences Summer Undergraduate Research Program, University of Minnesota, St. Paul, MN. *Mentored 12*

undergraduate students from underserved communities; taught presentation skills during weekly seminars; assisted students with preparation of posters describing their research; worked with students to resolve laboratory and administrative issues.

September 1996–
May 2000

Graduate Assistant, Department of Animal Science, University of Minnesota, St. Paul, MN. *Lectured and assisted with laboratory exercises for classes in introductory animal science, animal breeding, biometrics, and dairy production.*

June 1994–May
1996

Graduate Research Assistant, Department of Dairy Science, Louisiana State University of Minnesota, Baton Rouge, LA. *Assisted with lectures and laboratory exercises for classes in introductory genetics and animal breeding.*

Courses

“Computational Biology in Animal Breeding”, “Introductory Agricultural Genetics”, “Biometrics for Livestock”, “Animal Breeding”, “Introductory Animal Science”, “Plant and Animal Genetics”, “Applied Animal Breeding and Genetics”

Service on Graduate Committees

2019–Present

Ellen Freebern, University of Maryland College Park, Ph.D. (Advisor: L. Ma)

2018–Present

Maci L. Mueller, University of California, Davis, Ph.D. (Advisor: A.L. van Eenennaam)

2016

Mike Donnelly, University of Minnesota, M.S. (Advisors: L.B. Hansen and A.J. Seykora) (External Reviewer)

Allison Fleming, University of Guelph, Ph.D. (Advisor: F. Miglior) (External Reviewer)

2014–2016

Chen Yao, University of Wisconsin, Ph.D. (Advisor: K.A. Weigel)

2012–2016

Sofia Ortega, University of Florida, Ph.D. (Advisor: P.J. Hansen)

2010–2013

Kristen L. Parker Gaddis, North Carolina State University, Ph.D. (Advisor: C. Maltecca)

Postdoctoral Students Supervised

2018–Present

Bingjie Li

2018

Heather L. Bradford

2014–2016

Kristen L. Parker Gaddis

Professional Affiliations and Service

2019	Member of the Organizing Committee for the Strategic Planning Workshop for the Future of Biomedical and Agricultural Research Programs using Large Animals, Rockville, MD
2017	Member of the Organizing Committee for the Livestock High-Throughput Phenotyping and Big Data Analytics Meeting, Beltsville, MD
2016–2017	Chair of the Jay L. Lush Award Selection Committee for the American Dairy Science Association
2016	Grant reviewer for the Agriculture and Food Research Initiative (AFRI) Competitive Grants Program
2015–2016	Member of the Jay L. Lush Award Selection Committee for the American Dairy Science Association
2015–2016	Chair of the Breeding and Genetics Program Committee for the 2016 American Dairy Science Association/American Society for Animal Science Joint Annual Meeting
2015	Grant reviewer for peer reviewer for the Danish Council for Independent Research, Technology and Production Sciences
2014–2015	Secretary and President of the SCC-084 coordinating committee (“Genetic selection and mating strategies to improve the well-being and efficiency of dairy cattle”)
2013	Grant reviewer for the French National Research Agency (L'Agence Nationale de la Recherche) Key Opinion Leader for Pfizer Animal Genetics on genetic evaluation of functional traits and design and implementation of genetic evaluation programs for lowly heritable traits
2012–2013	Member of the Planning Committee for the 2013 International Committee for Animal Recording Health Data Conference in Aarhus, Denmark
2012	External reviewer for University of Minnesota Agricultural Experiment Station projects
2011–2012	Chair of the Breeding and Genetics Program Committee for the 2012 American Dairy Science Association/American Society for Animal Science Joint Annual Meeting
2010–present	Member of the Dairy Health Data Recording Project Advisory Board
2010–present	Member of the Editorial Board for Frontiers in Livestock Genomics

2010–present	Member of the Functional Traits Working Group of the International Committee for Animal Recording
2010	Consulted with representatives from Embrapa, GenSys, and Conexão Delta G on the design and implementation of a genomic selection program for Nellore cattle in Brazil
2009–2011; 2013–2015	Member of the Breeding and Genetics Program Committee for the 2010, 2011, 2014, and 2015 American Dairy Science Association Joint Annual Meetings
2009; 2011	Grant reviewer for Der Wissenschaftsfonds (Austrian competitive-funding agency)
2009–2010	Secretary and President of the S-1040 regional research project (“Genetic Selection and Crossbreeding to Enhance Reproduction and Survival of Dairy Cattle”)
2009	Reviewer for Binational Agricultural Research and Development grants
2006–2010	Member of the Editorial Board for the Journal of Animal Science
2006–2007	Non-voting member of Holstein Association USA’s Genetic Advancement Committee
2004–present	Member of National Dairy Shrine
2000–present	Member of the American Dairy Science Association
1998–present	Member of Gamma Sigma Delta, The Honor Society of Agriculture

Special Assignments for USDA

2019	Chair of animal scientist hiring panel for the Bovine Functional Genomics Laboratory
2017–Present	Member of the Beltsville Agricultural Research Center’s Animal Research Advisory Group
2016–Present	Member of the Beltsville Agricultural Research Center’s Research Leaders Board
2016	Selecting (hiring) official for a research biologist hiring panel for the Animal Genomics and Improvement Laboratory
2015	Selecting (hiring) official for an animal scientist hiring panel for the Animal Genomics and Improvement Laboratory
	Represented ARS at the ARS-RDA Animal Health Meeting in Jeonju, South Korea

2011–2013	Beltsville Agricultural Research Center Pamphlet Committee member
2012	Agricultural Research Service Office of Technology Transfer’s technology transfer award panelist
	Animal and Natural Resources Institute Seminar Series Committee member
2010	Chair of computational biologist hiring panel for the Bovine Functional Genomics Laboratory
2007	Chair of 2 support scientist hiring panels for the Bovine Functional Genomics Laboratory
2005–Present	OSHA-certified Collateral Duty Safety Officer

Community Service

July 2017– Present	Treasurer , Bowie Volunteer Fire Department and Rescue Squad, Inc., Bowie, MD.
March 2011– March 2017	Assistant Secretary , Company 19, Bowie Volunteer Fire Department and Rescue Squad, Inc., Bowie, MD.
December 2004– March 2011	Auxiliary Member , Bowie Volunteer Fire Department and Rescue Squad, Inc., Bowie, MD.

