

CURRICULUM VITAE

NAME

Enns, Richard Mark

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Animal Sciences
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EDUCATION

2004 Professional Animal Scientist

1995 Ph D, CSU

1991 MS, CSU

1987 Tabor College

OTHER POSITIONS

July 1, 2013 - Present Professor, Colorado State University.

2007 - June 30, 2013 Associate Professor, Colorado State University.

2001 - 2007 Assistant Professor, Colorado State University.

1997 - 2001 Assistant Professor, University of Arizona.

1996 - 1997 Temporary Research Scientist, Landcrop Farming Ltd.

PUBLISHED WORKS

Refereed Journal Articles

Miller, K.E., Whittier, J. C., Peel, R. K., Enns, R. M., Bruemmer, J. E., Umberger, W.J. Case Study: Comparison of Breeding and Marketing Systems for Red Angus Cattle Using an Integrated Computer-Based Spreadsheet. *The Professional Animal Scientist*, 20, 429-436.

French, J., Ahola, J. K., Whittier, J. C., Giles, R., Frasier, W. M., Enns, R. M., Peel, R. K. (in press). Differences in lifetime productivity of beef heifers conceiving to artificial insemination (AI) vs natural service (NS) as a yearling and among females that were offspring of an AI or NS mating. *Prof Anim Sci manuscript 12-01155*.

Peel, R. K., Whittier, J. C., Enns, R. M., Grove, A., Seidel, G. E. (in press). Effect of Six versus Twelve Hour Interval between Two Prostaglandin F₂± Injections Administered with Gonadotropin-Releasing Hormone and Controlled Internal Drug-Release on Pregnancy Rate in Beef Cows. *The Professional Animal Scientist*.

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- Diaz, I. D.P.S., Crews, D., Enns, R. M. (2014). Cluster and meta-analyses of genetic parameters for feed intake traits in growing beef cattle. *Journal of Animal Breeding and Genetics*, 131, 217-226.
- Bates, K. E., Weaber, R. L., Bormann, J. M., Moser, D. W., Salak-Johnson, J. L., Chase, C. C. L., Peel, R. K., Van Campen, H., Loneragan, G. H., Wagner, J. J., Boddhireddy, P., Payaga, K., Enns, R. M. Relationships among temperament, immune function, and carcass merit in beef cattle. *Western Section American Society of Animal Science*, 64.
- Nielsen, M. K., MacNeil, M. D., Dekkers, J.C. M., Crews, D., Rathje, T. A., Enns, R. M., Weaber, R. L. (2013). Life-cycle, total-industry genetic improvement of feed efficiency in beef cattle: Blueprint for the Beef Improvement Federation. *Professional Animal Scientist*, 29, 559-565.
- Bates, K. E., Weaber, R. L., Bormann, J. M., Moser, D. W., Salak-Johnson, J. L., Chase, C. C. L., Peel, R. K., Van Campen, H., Loneragan, G. H., Wagner, J. J., Boddhireddy, P., Payaga, K., Enns, R. M. (2013). Relationships among temperament, immune function, and carcass merit in beef cattle. *Western Section American Society of Animal Science*, 64.
- (2011). Characterization of bovine respiratory disease prevalence in feedlot steers and associated effects on carcass performance.
- (2011). Effects of genetic markers and implant strategy on longissimus and gluteus muscle tenderness of calf-fed steers and heifers. *J Anim Sci*, 89, 1401-1411.
- (2011). Genetic analyses involving microsatellite ETH10 genotypes on bovine chromosome 5 and performance trait measures in Angus and Brahman-influenced cattle. *J Anim Sci*, 89, 2031-2041.
- (2011). Genetic parameters for intramuscular fat percentage, marbling score, scrotal circumference, and heifer pregnancy in Red Angus cattle. *J Anim Sci*.
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- (2010). Genetic analysis of longitudinal data in beef cattle. *Genet Mol Res*, 9, 19-33.
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- (2010). Growth characteristics, reproductive performance, and evaluation of their associative relationships in Brangus cattle managed in a Chihuahuan Desert production system. *J Anim Sci*, 88, 1891-1904.

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- (2008). Comparison of a caprolactone/lactide film (Mesofol) to two polylactide film products as a barrier to postoperative peridural adhesion in an ovine dorsal laminectomy model. *Spine*, 33, 1518-1526.
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- (2007). Associations of DNA polymorphisms in growth hormone and its transcriptional regulators with growth and carcass traits in two populations of Brangus bulls. *Genet Mol Res*, 6, 222-237.
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- (2007). Genetic analysis of rebreeding to produce a calf at three years of age in beef cows. *Poultry Sci*, 86, 191-191.
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- (2007). Weaning weight inheritance in environments classified by maternal body weight change. *J Anim Sci*, 85, 610-617.
- (2006). Effects of a long-acting, trace mineral, reticulorumen bolus on range cow productivity and trace mineral profiles. *J Anim Sci*, 84, 1439-1453.
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- (2006). Examination of potential methods to predict pulmonary arterial pressure score in yearling beef cattle. *J Anim Sci*, 84, 1259-1264.
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- (2005). Fish meal supplementation alters uterine prostaglandin F-2 alpha synthesis in beef heifers with low luteal-phase progesterone. *J Anim Sci*, 83, 1832-1838.
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- Priest, M.K., Peel, R. K., Whittier, J. C., Enns, R. M., Seidel, G. E. *Effect of 6-H VS 12-H Interval Between Two Prostaglandin Injections in Beef Cows Synchronized for Ovulation Using the 5-D Co-Synch +Cidr Protocol* (vol. 60, pp. 245-247). Proceedings, Western Section, American Society of Animal Science.
- Brigham, B.W., McAllister, C.M., Enns, R. M., Peel, R. K. (in press). *Genetic parameters associated with feedlot bovine respiratory disease complex morbidity and mortality*. Western Section, American Society of Animal Sciences.
- Culbertson, M.M., Speidel, S. E., Cockrum, R.R., Peel, R. K., Crews, D., Enns, R. M. *Optimum performance testing periods for determining feed efficiency and its parameters in beef cattle*. Western Section, American Society of Animal Sciences.
- Pepper, A.R., Enns, R. M., Weaber, R.L., Van Campen, H., Loneragan, G.H., Salak-Johnson, J.L., Chase, C.C.L., Peel, R. K. *Relationships of Exit Velocity and Average Chute Score with Carcass Traits in Feedlot Steers* (vol. 60, pp. 34-36). Proceedings, Western Section, American Society of Animal Science.
- Hyland, A., Whittier, J. C., Seidel, G. E., Enns, R. M., Peel, R. K. *Variations in Interval Between GnRH and Prostaglandin F2 Alpha Injections and CIDR insertion for 5 or 7 days on Pregnancy Rate and Follicular Response* (vol. 59, pp. 277-280). Proceedings, Western Section, American Society of Animal Science.
- Cockrum, R.R., Zeng, X., Berge, N.F., Neary, J.M., Garry, F.B., Holt, T. N., Blackburn, H.D., Thomas, S. P., Speidel, S.E., Garrick, D.J., Enns, R.M., Thomas, M.G. (2014). Angus cattle at high altitude: genetic relationships and initial genome wide association analyses of pulmonary arterial pressure. *10th World Congr. Appl. Livestock Prod.* WCGALP. https://asas.org/docs/default-source/wcgalp-proceedings-oral/236_paper_9105_manuscript_427_0.pdf?sfvrsn=2
- Culbertson, M.M., Speidel, S. E., Thomas, M.G., Keenan, L., Enns, R.M. (2014). Effect of genetics level of beef cow milk production on longevity in diverse environments. *10th World Congr. Appl. Livestock Prod.* WCGALP. https://asas.org/docs/default-source/wcgalp-posters/766_paper_9935_manuscript_1097_0.pdf?sfvrsn=2
- Speidel, S. E., S., Cockrum, R., Salak-Johnson, J. L., Chase, C. C. L., Thomas, M., Peel, R. K., Enns, R. M. (2014). Genetic analysis of receiving weight, ultrasound back fat, ultrasound rib eye area, ultrasound percent intramuscular fat, and bovine respiratory disease in feedlot cattle. *10th World Congr. Appl. Livestock Prod.* WCGALP. https://asas.org/docs/default-source/wcgalp-posters/519_paper_8807_manuscript_253_0.pdf?sfvrsn=2
- Zeng, X., Cockrum, R.R., Berge, N.F., Neary, J.M., Garry, F.B., Holt, T. N., Blackburn, H.D., Speidel, S.E., Garrick, D.J., Enns, R.M., Thomas, M.G. (2014). Genetic correlation and genome wide association study of pulmonary arterial pressure and post weaning growth traits in Angus heifers from a high altitude breeding program. *10th World Congr. Appl. Livestock Prod.* WCGALP.

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Berge, N.F., Speidel, S.E., Zeng, X., Culbertson, M.M., Thomas, M.G., Enns, R.M. (2014). Genetic relationships between pulmonary arterial pressure and performance traits in Colorado State University Beef Improvement Center Angus herd. *10th World Congr. Appl. Livestock Prod. WCGALP.* https://asas.org/docs/default-source/wcgalp-posters/430_paper_9946_manuscript_1110_0.pdf?sfvrsn=2

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Hernandez, P. R., Luna-Nevarez, Rincon, G., Medrano, J.F., Enns, R.M., Thomas, M.G. (2014). Relationships of endocrine pathway SNP and molecular breeding value with milk production traits in heat stressed Holstein cows. *Proc. 10th World Congr. Appl. Livestock Prod. WCGALP.* https://asas.org/docs/default-source/wcgalp-posters/429_paper_9851_manuscript_1029_0.pdf?sfvrsn=2

Thomas, M.G., Berge, N.F., Enns, R.M., Hagevoort, G.R., Eenennaam, A.L. V., Neiberghs, H.L., Neiberghs, J.S., Womack, J. E. (2014). Research trainee participation is a bonus to teaching aims in the Bovine Respiratory Disease Complex Coordinated Agricultural Project. *10th World Congr. Appl. Livestock Prod. WCGALP.* https://asas.org/docs/default-source/wcgalp-proceedings-oral/225_paper_8756_manuscript_234_0.pdf?sfvrsn=2

Non-Refereed Journal Articles

Neary, J.M., Garry, F. B., Holt, T. N., Thomas, M., Enns, R. M. (2015). Mean pulmonary arterial pressures in Angus steers increase from cow-calf to feedlot-finishing phases. *J. Anim. Sci.*, *93*, 3854-3861.

Krafsur, G. M., Brown, R.D., Neary, J.M., Holt, T. N., Gould, D. H., Riddle, S., Canovas, A., Medrano, J., Enns, R. M., Cockrum, R., Thomas, M., Stenmark, K.R. (2015). Natural history of pulmonary hypertension: adaptive versus maladaptive physiologic responses and cardiopulmonary remodeling in beef cattle exposed to chronic hypoxia. *Am. J. Respir. Crit. Care Med.*, *191*, A5535.

Brown, R.D., Canovas, A., Riddle, S., Neary, J.M., Islas-Trejo, A., Krafsur, G. M., Cockrum, R., Enns, R. M., Medrano, J., Thomas, M., Stenmark, K.R. (2015). Natural history of pulmonary hypertension: transcriptome analysis of right ventricular remodeling and failure in beef cattle exposed to chronic hypoxia. *Am. J. Respir. Crit. Care Med.*, *191*, A1041.

Culbertson, M. M., Speidel, S. E., Peel, R. K., Cockrum, R., Thomas, M., Enns, R. M. (2015). Optimum measurement period for evaluating feed intake traits in beef cattle. *J. Anim. Sci.*, *93*, 1-9.

Neary, J.M., Garry, F. B., Holt, T. N., Brown, R.D., Stenmark, K.R., Enns, R. M., Thomas, M. (2015). The altitude at which a calf is born and raised determines the rate at which mPAP increases with age. *J. Anim. Sci.*, *93*, 1-7.

Speidel, S. E., Peel, R. K., Crews, D., Enns, R. M. (2015). Random regression models for the prediction of days to weight, ultrasound rib eye area and ultrasound back fat depth in beef cattle. *Journal of Animal Science.*

Cockrum, R. R., Speidel, S. E., Salak-Johnson, J., Chase, C., Peel, R. K., Weaver, R. L., Loneragan, G. H., Wagner, J. J., Boddhireddy, P., Thomas, M., Prayaga, K., DeNise, S., Enns, R. M. Genetic parameters estimated at receiving for circulating cortisol, immunoglobulin G, interleukin 8, and incidence of bovine respiratory disease in feedlot beef steers. *Journal of Animal Science.*

Gruber, S. L., Tatum, J. D., Engle, T. E., Chapman, P. L., Enns, R. M., Belk, K. E., Smith, G. C. (2011). Effects

of genetic markers and implant strategy on longissimus and gluteus muscle tenderness of calf-fed steers and heifers. *Journal of animal science*, 89(5), 1401-11.

Hackett, E. S., MacLeay, J. M., Green, M., Enns, R. M., Pechey, C. L., Les, C. M., Turner, A. S. (2009). Femoral Cortical Bone Mineral Density and Biomechanical Properties in Sheep Consuming an Acidifying Diet. *Nutrition and Metabolic Insights*, 1, 11-16.

Non-Refereed Proceedings or Transactions

Zeng, X., Speidel, S. E., Thomas, M., Enns, R. M. *Estimating Economic Values of Traits Belonging to Cattle in Maternal Beef Production. Proc. West. Sect. Am. Soc. Anim. Sci.*. American Society of Animal Science.

Blackburn, H., Thomas, M., Enns, R. M., Speidel, S. E., Paiva, S. (2015). A livestock database for long term storage and use of genomic and other associated information. *Plant and Animal Genome XXIII* (pp. Abstract W142). Plant and Animal Genome XXIII.

Zeng, X., Holt, T. N., Enns, R. M., Speidel, S. E., Thomas, M. (2015). Angus cattle at high altitude: Relationship between age and pulmonary arterial pressure. *Proc. West. Sect. Am. Soc. Anim. Sci.* (vol. 66, pp. 119-121). Proc. West. Sect. Am. Soc. Anim. Sci..

Zamorano-Algandar, R., Correa-Calderon, A., Sanchez-Castro, M., Rincon, G., Medrano, J.F., Hernandez, A., Luna-Nevarez, G., Speidel, S. E., Enns, R. M., Thomas, M., Luna-Nevarez, P. (2015). Candidate gene molecular breeding value prediction of reproductive performance in Holstein dairy cows managed under heat stress conditions from southern Sonora in Mexico. *Proc. West. Sect. Am. Soc. Anim. Sci.* (vol. 66, pp. 249-252). Proc. West. Sect. Am. Soc. Anim. Sci..

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Krafur, G. M., Brown, D., Neary, J., Holt, T. N., Gould, D. H., Riddle, S., Canovas, A., Medrano, J., Enns, R. M., Thomas, M., Stenmark, K. (2015). Natural history of pulmonary hypertension: adaptive versus maladaptive physiologic responses in beef cattle exposed to chronic hypoxia and the role of inflammation in the progression of pulmonary hypertension. *50th Am. Assoc. Vet. Lab. Diagn. Mtg* (pp. p. 81). 50th Am. Assoc. Vet. Lab. Diagn. Mtg.

- Saad, H.M., Enns, R. M., Thomas, M., Speidel, S. E. (2015). Performance losses due to selection for low birth weight versus calving ease: a simulation study in beef cattle. *Proc. West. Sect. Am. Soc. Anim. Sci.* (vol. 66, pp. 129-132). Proc. West. Sect. Am. Soc. Anim. Sci..
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- Boldt, R. J., Speidel, S. E., Thomas, M., Enns, R. M. (2015). Variance components for genetic evaluation of body condition score in beef cattle. *Proc. West. Sect. Am. Soc. Anim. Sci.* (vol. 66, pp. 108-110). Proc. West. Sect. Am. Soc. Anim. Sci..
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- Zeng, X., Speidel, S. E., Thomas, M., Enns, R. M. (2013). *Estimating Economic Values of Traits Belonging to Cattle in Maternal Beef Production.* Proc. West. Sect. Am. Soc. An. Sci.. American Society of Animal Science.
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- (2012). *Cumulative discounted gene expression for economically relevant traits for terminal and maternal purpose in cattle production system* (suppl 3 ed., vol. 90, pp. 452). J Anim Sci.
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- (2012). *Genetic parameters associated with feedlot bovine respiratory disease complex morbidity and mortality* (3rd ed., vol. 90, pp. 228). J Anim Sci.

- (2012). *Genetic trends for growth-related traits and calving ease of Simmental beef cattle* (3rd ed., vol. 90, pp. 20). J Anim Sci.
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- (2011). *Braunvieh 2010/2011 Sire Summary Evaluation*. Report to Braunvieh Association of America for inclusion with their sire summary, 2 pgs.
- (2011). *Effects of a long acting trace mineral rumen bolus upon range cow productivity* (vol. 62, pp. 349-353). Proceedings of the Western Section of the American Society of Animal Science.
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- (2011). *Genetic and phenotypic parameters for carcass and ultrasound traits of american shorthorn beef cattle* (vol. 62, pp. 108-111). Proceedings of the Western Section of the American Society of Animal Science.
- (2011). *Genetic associations between bovine respiratory disease and carcass traits in feedlot steers* (vol. 62, pp. 89-92). Proceedings of the Western Section of the American Society of Animal Science.
- (2011). *Genetic evaluation of postpartum interval in Charolais cows* (vol. 62, pp. 104-107). Proceedings of the Western Section of the American Society of Animal Science.
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- (2011). *Inclusion of Ultrasound Intramuscular Fat into Ultrasound Fat EBV and Accuracy Calculations*. CGEL Report to Rissington Breedline, Ltd 3 pgs.
- (2011). *Random regression methodologies used for a days to weight genetic prediction in beef cattle* (vol. 62, pp. 93-97). Proceedings of the Western Section of the American Society of Animal Science.
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- (2011). *Using EPD in the Seedstock Herd*. Brangus Journal.
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- (2010). *Analysis of published genetic parameter estimates for feed utilization traits in beef cattle* (E-Suppl 2 ed., vol. 88, pp. 184). J Anim Sci.
- (2010). *Braunvieh 2009/2010 Sire Summary Evaluation*. Colorado State University Center for Genetic Evaluation of Livestock 2 pgs.
- (2010). *Factors influencing onset of disease and subsequent effects on feedlot performance* (E-Suppl 2 ed., vol. 88, pp. 466). J Anim Sci.
- (2010). *Genetic Improvement: Staying Focused*. Frontline (a commercial producer publication by the International Brangus Breeder's Association) 1pg.
- (2010). *Grazing Management and Genetic Improvement*. Frontline.
- (2010). *Interpreting Total Maternal EPD*. Brangus Journal.
- (2010). *Matching your environment*. Brangus Journal.
- (2010). *Milk EPD--How do they work?*. Frontline.
- (2010). *Report to American Gelbvieh Association*. Summary of Changes to Carcass and Stayability Evaluations 9 pgs.
- (2010). *Techniques for sifting inconsistent data points from repeatedly weighted beef cattle* (E-Suppl 2 ed., vol. 88, pp. 39). J Anim Sci.
- (2010). *The 2010 American Shorthorn Sire Summary*. Written as the introduction to the sire summary analysis 2 pages.
- (2010). *The effect of morbidity on feedlot performance and carcass quality in feedlot steers* (E-Suppl 2 ed., vol. 88, pp. 10). J Anim Sci.
- (2010). *The Impacts of AI on Genetic Improvement*. Brangus Journal.
- (2010). *The push for feed efficiency: How will it affect our cows?*.
- (2010). *The relationship of bovine respiratory disease and carcass ultrasound measures* (E-Suppl 2 ed., vol. 88, pp. 41). J Anim Sci.

AES Report/Bulletin

Speidel, S. E., Enns, R. M. (2016). *Center for Genetic Evaluation of Livestock CRIS report*. CSU Agriculture Experiment Station.

Abstract

Trejo, C.M. A., Rubio, J.A. R., Nevarez, P. L., Thomas, M., Enns, M. (2014). Abstract #162 in Identification de cerados (*Sus scrofa domestica*): resistencia a la infeccion del PRRS a traves de selection genomica en el sur de Sonora, Mexico. *2nd Encuentro de Jovenes Investigadores en el Estado de Sinaloa*. Mexican Agricultural Sciences.

Book Review

(2010). *Selection Decisions: Tools for economic improvement beyond EPD* (pp. 42-49). Beef Sire Selection Manual, 2nd Edition National Beef Cattle Evaluation Consortium Eds: MK Nielsen This is a revision of the chapter originally written for the 1st Edition in 2006.

(2010). *The Role of economically relevant and indicator traits* (pp. 17-20). Beef Sire Selection Manual, 2nd Edition National Beef Cattle Evaluation Consortium Eds: MK Nielsen, coordinator This is a revision of the chapter originally written for the 1st Edition in 2006.

Invited Paper

Lewis, R. M., Spangler, M. L., Lockee, B. B., Enns, R. M., Enns, K. J., Dekkers, J. C., C. M., Cassady, J. P., MacNeil, M., Gould, C. A., Boggs, D. L., Misztal, I., Pollak, E. J. (2014). *Filling the Knowledge Gap: Integrating Quantitative Genetics and Genomics in Graduate Education and Outreach*. World Congress of Genetics Applied to Livestock Production.

Supporting Author BRDC-CAP grant publication by H.L. Neibergs et al.

Thomas, M. G., Enns, R. M. (2014). *Susceptibility loci revealed for bovine respiratory disease complex in pre-weaned Holstein calves* (vol. 15, pp. 1164). BMC Genomics.

Technical Report

Zeng, X., Speidel, S. E., Enns, R. M. (2015). *Report to Powerline Genetics. Incorporation of external sire EPD into growth and carcass evaluations..* Powerline Genetics.

Boldt, R. J., Enns, R. M., Thomas, M., Speidel, S. E. (2015). *Report to the Red Angus Association of America. Research Update: Red Angus Next Generation Fertility genetic evaluation.* Red Angus Association of America.

Zeng, X., Speidel, S. E., Enns, R. M. (2015). *Report to Powerline Genetics. Evaluating the magnitude of EPD model changes..* Powerline Genetics.

Boldt, R. J., Speidel, S. E., Enns, R. M. (2015). *Report to the North American Limousin Foundation. Changes to genetic predictions corresponding to a change in association database providers..* North American Limousin Foundation.

Culbertson, M., Speidel, S. E., Enns, R. M. (in press). *Report to the Red Angus Association of America. Evaluation of Alternative Data Use for Mature Cow Maintenance Energy EPD..* Red Angus Association of America.

Speidel, S. E., Enns, R. M. (in press). *Report to the American Gelbvieh Association. Initial results of analysis for multi-breed Stayability..* American Gelbvieh Association.

Speidel, S. E., Zeng, X., Enns, R. M. *Report to the Angus Society of Australia: Results of a prototype aggregate stayability EBV..* Angus Society of Australia.

PAPERS PRESENTED/SYMPOSIA/INVITED LECTURES/PROFESSIONAL MEETINGS/WORKSHOPS

December 2015, "Genetic Evaluation", Powerline Breeders Annual Meeting, Genus, Ltd.

2015, "Genetics and Genetic Change", Colorado Ranching Legacy Program, Colorado Cattlemens' Association.

December 10, 2015, "Influence of incomplete data reporting on genetic evaluation results", Powerline genetics multiplier meeting, Powerline genetics.

November 2015, "Matching Genetics to Your Environment: PAP and High Altitude Disease", American Angus Association Annual Convention, American Angus Association, (Presenter) Enns, R. M.

November 2015, "Basic Genetics, Traits, and Phenotypes", Equine Genetics Short Course, Animal Sciences.

October 2015, "BIF Feed Intake Guidelines Revisions", Brown Bagger.

September 11, 2015, "Next Generation Red Angus Fertility Evaluation Research Update", Red Angus Association of America National Convention, Red Angus Association of America, (Presenter) Boldt, R. J.

June 2015, "Phenotypic Data Collection for Bovine Respiratory Disease", Beef Improvement Federation Annual Meeting, Beef Improvement Federation.

June 25, 2015, "Angus cattle at high altitude: Relationship between age and pulmonary arterial pressure", Western Section American Society of Animal Science, American Society of Animal Science, (Presenter) Zeng, X.

June 25, 2015, "Effects of beef cow milk production levels on longevity from Colorado State University's Beef Improvement Center", Western Section American Society of Animal Science, American Society of Animal Science, (Presenter) Culbertson, M. M.

June 25, 2015, "Genotypes within the prolactin and GH-IGF1 pathways association with 305 d milk yield in heat stressed lactating Holstein cows", Western Section American Society of Animal Science, American Society of Animal Science, (Presenter) Hernandez, A.

June 25, 2015, "Multivariate analysis of genetic relationships between pulmonary arterial pressure and performance traits in an Angus herd at high elevation.", western Section American Society of Animal Science, american Society of Animal Science, (Presenter) Crawford, N. F.

June 25, 2015, "Performance losses due to selection for low birth weight versus calving ease: a simulation study in beef cattle.", western Section American Society of Animal Science, American Society of Animal Science, (Presenter) Saad, H.

June 25, 2015, "Variance components for genetic evaluation of body condition score in beef cattle.", Western Section American Society of Animal Science, American Society of Animal Science, (Presenter) Boldt, R. J.

April 18, 2015, "High Altitude Disease, PAP and Genetic Improvement", Beef Industry Dinner and Program, CVMBS and Animal Science.

March 2015, "Genetic Improvement in Alpaca: Data Collections and Interpretation of EPD", Annual Convention, Alpaca Owners' Association.

February 2015, "EPDs Explained: The AOA EPD Program", Amber Autumn Alpacas Invitational, Amber Autumn Alpacas.

January 2015, "Distance Graduate Education", Annual Meeting of PIs for BRD Coordinated Agricultural Project, USDA-NIFA.

January 2015, "High Altitude Disease, PAP and Genetic Improvement", NWSS--National Association of Animal Breeders and Angus Association Board of Directors, NAAA and AAA, (Presenter) Holt, T. N.

August 20, 2014, "Effect of genetic level of beef cow milk production on longevity in diverse environments.", 10th World Congress of Genetics Applied to Livestock Production, (Presenter) Culbertson, M., Vancouver, British Columbia, Canada, peer-reviewed/refereed.

August 20, 2014, "Genetic Correlation and genome wide association study of pulmonary arterial pressure and post

weaning growth traits in Angus heifers from a high altitude breeding program.", 10th World Congress of Genetics Applied to Livestock Production, (Presenter) Zeng, X., Vancouver, British Columbia, Canada, peer-reviewed/refereed.

August 20, 2014, "Genetic relationships between pulmonary arterial pressure and performance traits in Colorado State University's Beef Improvement Center cowherd.", 10th World Congress of Genetics Applied to Livestock Production, (Presenter) Berge, N., Vancouver, British Columbia, Canada, peer-reviewed/refereed.

August 20, 2014, "Phenotypic analysis of pulmonary arterial pressure and feed intake data in cattle.", 10th World Congress of Genetics Applied to Livestock Production, (Presenter) Boldt, R., Vancouver, British Columbia, Canada, peer-reviewed/refereed.

August 18, 2014, "Angus cattle at high altitude: genetic relationships and initial genome wide association analyses of pulmonary arterial pressure.", 10th World Congress of Genetics Applied to Livestock Production, (Presenter) Cockrum, R., Vancouver, British Columbia, Canada, peer-reviewed/refereed.

August 18, 2014, "Genetic Analysis of receiving weight, ultrasound back fat, ultrasound rib eye area, ultrasound percent intramuscular fat, and bovine respiratory disease in feedlot cattle.", 10th World Congress of Genetics Applied to Livestock Production, (Presenter) Speidel, S. E., Vancouver, British Columbia, Canada, peer-reviewed/refereed.

August 14, 2014, "Update on Online Course Development and Offerings", BRD CAP Grant Advisory Committee Meeting, USDA NIFA, (Presenter) Enns, R. M., Seattle, WA.

August 2, 2014, "Genetic Improvement in Bovine Pulmonary Hypertension", PAP Summit, CSU, ARDEC, Fort Collins.

August 1, 2014, "High Altitude Disease, PAP, and Genetic Improvement", PAP Summit, CSU, ARDEC, Fort Collins.

July 20, 2014, "Understanding and Using the AOA EPD System", Rocky Mountain Rendezvous, Livermore, Colorado.

January 9, 2014, "Update on Online Course Development and Offerings", BRD CAP Grant Advisory Committee Meeting, USDA NIFA, (Presenter) Enns, R. M., San Diego, CA.

July 30, 2013, "Update on Online Course Development and Offerings", BRD CAP Grant Advisory Committee Meeting, USDA NIFA, (Presenter) Enns, R. M., Fort Collins, CO.

July 7, 2013, "Cortisol, interleukin 8, and immunoglobulin G ratios predict treatment for bovine respiratory disease in feedlot cattle.", Joint Annual meetings, American Society of Animal Science, (Presenter) Speidel, S. E., Indianapolis, IN, peer-reviewed/refereed.

July 7, 2013, "Heritability and correlations of immune response parameters in cattle treated for bovine respiratory disease.", Joint Annual meetings, American Society of Animal Science, (Presenter) Cockrum, R. R., Indianapolis, IN, peer-reviewed/refereed.

2012, "Breeding and Genetics. IsTec Committee Meeting. May."

2012, "Cluster and Meta-Analysis of Genetic Parameters for Feed Intake Traits in Beef Cattle. I.D.P.S., Diaz, D. H. Crews, Jr., and R. M. Enns. Annual Meeting of American Society of Animal Science. July. Phoenix."

2012, "Data flow and collection for the production of EPD for disease traits. November 2012. Obregon, Sonora, Mexico @ ITSON (Institute Technologic de Sonora).".

2012, "Developing a Multi-Breed Stayability EPD. Annual Meeting of the American Gelbvieh Association. Denver. January.".

2012, "DNA in Animal Production. Ricks Center for Gifted Children "STEM Day". Denver. April.".

2012, "Economically Relevant Traits: What is on the Horizon? Red Angus Association of America Brain Trust Meeting. January. Denver.".

2012, "Genetics of Animal Health. Ranch Practicum. Fort Collins. November.".

2012, "Maintenance and enhanced utilization of genomic data for livestock genetics. Joint meeting of USDA-NAGP and CSU Breeding and Genetics for producers. Fort Collins. June.".

2012, "Preparing for Careers in Breeding and Genetics. University of Wyoming. November.".

2012, "Profit Simplified: The Role of Economic Indexes. Red Angus Association of American and American Simmental Association Beef Profit Alliance Meeting. Manhattan, KS. July".

2012, "Selection for Economically Relevant Traits: Current Research. Novus International Global Beef Roundtable. Fort Collins. December.".

2012, "Summary of Online Course Development--Teaching. BRD Coordinated Agricultural Program. Sacramento. August.".

2012, "The Genetics of Disease Resistance and Susceptibility. National Cattlemen's Beef Association's Cattlemen's College. January. Nashville.".

2011, "Enns, R. M. Enhancing research partnerships: University Beef Cow Populations. Presentation to the Red Angus Association of America Foundation. January 8, 2011. Denver, CO".

2011, "Enns, R. M. Evidence of genetic variability in cattle health traits: Opportunities for improvement. 43rd Annual Meeting and REsearch Symposium of the Beef Improvement Federation. Bozeman, MT. June 2011.".

2011, "Enns, R. M. Genetic Improvement of beef cattle in the United States. ARDEC. Presentation to Uruguayan and Paraguayan Beef Producer tour. November, 2011."

2011, "Enns, R. M. The use of genomic data for genetic prediction in beef cattle--an update. Greeley Farm Show. January 2011."

2011, "Enns, R. M. Update on the Graduate Animal Breeding Distance Education Modules. Presentation to the Industry Advisory Council of the National Beef Cattle Evaluation Consortium. Denver, February 1, 2011."

2011, "Enns, R. M., S. E. Speidel, B. W. Brigham, C. M. McAllister. Genetic Improvement in Beef Cattle Adaptability. Calgary. June 2011."

2011, "Enns, R. M., S. E. Speidel, B. W. Brigham, C. M. McAllister. Selection for cow fertility and maintenance requirements--improving adaptability. Calgary, AB, May 2011."

2011, "Enns, R.M. Update on CSU Breeding Research. Red Angus Association of America Board of Directors. Denver, CO January 7, 2011".

2011, "Enns, R.M. Update on Genetics of Feedlot Cattle Health. Presentation to the Advisory Council of the National Beef Cattle Evaluation Consortium. Denver February 1, 2011."

2010, "Crews, D.H., R.M. Enns and S.E. Speidel. Beef Cattle Genetics Program. Presented by S. Speidel and the joint meeting of the Colorado Simmental and Red Angus Associations. 2010."

2010, "Enns, R. M. Factors affecting feedlot performance. AgReserves, Inc. Beef Managers Meeting. Gudmensen, NE".

2010, "Enns, R. M. Genetics of Feedlot Health Report. Presentation to the NBCEC Industry Advisory Council Meeting. San Antonio. January 2010."

2010, "Enns, R. M. Livestock Breeding and Genetics. Fort Collins, 2010. Presentation to Sterling High School Students."

2010, "Enns, R. M. Minimizing incidence of

brisket disease. Rifle, CO. February, 2010".

2010, "Enns, R. M. Red Angus Association of America: Braintrust 2010. Denver. January 2010."

2010, "Enns, R. M. The one game changer for 2020. Fort Collins. (presentation at the pre-sale educational event of Leachman of Colorado/CSU."

2010, "Enns, R. M. Update on the ARI EPD project. Suri Network Annual Conference. Estes Park. August, 2010."

2010, "Enns, R. M. Beef breeding and genetics the top research priorities and application. Dept. of Animal Sciences Nutrition Seminar series."

2010, "Enns, R. M. Genetics of Feedlot Cattle Health. Presented at the Beef Improvement Federation Annual Meeting and Research Symposium. Columbia, MO."

2010, "Enns, R. M. NALF Carcass EPD Process: After the database switch. Presented at the Board of Directors meeting of the North American Limousin Foundation. Denver."

2010, "Enns, R. M. Update on disease susceptibility. The National Beef Cattle Evaluation Consortium Brown Bagger online lecture series. October."

2010, "Enns, R. M., R. L. Weaver, H. Van Campen, and G. H. Loneragan. Factors influencing onset of disease and subsequent effects on feedlot performance. July 2010. Denver".

2010, "Enns, R.M. and D.H. Crews. CSU Station Report. Presented at the annual WERA-1 conference. Reno, NV."

2010, "Lewis, R., R. M. Enns, B. Lockee, J. Cassady, M. Spangler, C. Maltecca, and J. Pollak. Update on graduate animal breeding distance education modules. Presented at the annual meeting of the NCERA-199. October, 2010."

2010, "M. MacNeil and R.M. Enns. Celebrating Charley's work in three resolutions. Co-developed and presented at the WERA-1

Annual Meeting and Charley Gaskings
Retirement Symposium. Reno."

TEACHING:

<u>Year</u>	<u>Semester</u>	<u>Course No./Title</u>	<u>Cr. Hrs.</u>	<u>Enrollment</u>
2016	Spring	AGRI634 - Animal Production Systems	3	21
2016	Spring	ANEQ580A2 - Genetics of Bovine Respiratory Disease	1	0
2016	Spring	ANEQ580A3 - Marker- and Gene- Assisted Selection	1	1
2016	Spring	ANEQ580A3 - Marker- and Gene- Assisted Selection	1	2
2015	Fall	ANEQ580A1 - Applied Bovine Respiratory Disease Management	1	2
2015	Fall	ANEQ581A1 - Genetic Prediction in Livestock	1	7
2015	Fall	ANEQ330 - Principles of Animal Breeding	3	7
2015	Fall	ANEQ500 - Recent Developments	6	2
2015	Fall	ANEQ792B - Seminar-Breeding/Genetics	1	9
2015	Fall	ANEQ784 - Supervised College Teaching	18	29
2015	Fall	ANEQ699 - Thesis	18	10
2015	Spring	AGRI634 - Animal Production Systems	3	19
2015	Spring	ANEQ580A2 - Genetics of Bovine Respiratory Disease	1	5
2015	Spring	ANEQ330 - Principles of Animal Breeding	3	82
2015	Spring	ANEQ334 - Principles of Equine Genetics	3	78
2015	Spring	ANEQ500 - Recent Developments	6	6
2015	Spring	ANEQ631 - Selection Index Theory - Recitation	0	0
2015	Spring	ANEQ792B - Seminar-Breeding/Genetics	1	9
2015	Spring	ANEQ784 - Supervised College Teaching	18	28
2015	Spring	ANEQ699 - Thesis	18	9
2014	Fall	AGRI634 - Animal Production Systems	3	18
2014	Fall	AGRI634 - Animal Production Systems-Lab	0	18
2014	Fall	ANEQ580A1 - Applied Bovine Respiratory Disease Management	1	7
2014	Fall	ANEQ580A1 - Applied Bovine Respiratory Disease Managment	1	1
2014	Fall	ANEQ330 - Principles of Animal Breeding	3	2
2014	Fall	ANEQ500 - Recent Developments	6	5
2014	Fall	ANEQ699 - Thesis	18	9
2014	Summer	ANEQ487A - Internship: Animal	6	36
2014	Spring	AGRI634 - Animal Production Systems	3	27
2014	Spring	ANEQ799 - Dissertation	18	6
2014	Spring	ANEQ330 - Principles of Animal Breeding	3	75
2014	Spring	ANEQ334 - Principles of Equine Genetics	3	89
2014	Spring	ANEQ500 - Recent Developments	6	4
2014	Spring	ANEQ631 - Selection Index Theory	3	3
2014	Spring	ANEQ631 - Selection Index Theory - Recitation	0	3
2014	Spring	ANEQ792B - Seminar-Breeding/Genetics	1	5
2014	Spring	ANEQ384 - Supervised College Teaching	5	32
2014	Spring	ANEQ784 - Supervised College Teaching	18	23
2013	Fall	AGRI634 - Animal Production Systems	3	7
2013	Fall	AGRI634 - Animal Production Systems-Lab	0	7
2013	Fall	ANEQ799 - Dissertation	2	1
2013	Fall	ANEQ799 - Dissertation	18	7
2013	Fall	AGRI634 - Livestock Production Systems	3	7
2013	Fall	ANEQ500 - Recent Developments	1	2
2013	Fall	ANEQ500 - Recent Developments	6	2
2013	Fall	ANEQ699 - Thesis	6	2

2013	Fall	ANEQ699 - Thesis	18	4
2013	Spring	AGRI634 - Animal Production Systems	3	26
2013	Spring	ANEQ799 - Dissertation	18	5
2013	Spring	ANEQ487 - Internship	18	22
2013	Spring	ANEQ330 - Principles of Animal Breeding	3	66
2013	Spring	ANEQ500 - Recent Developments	6	5
2013	Spring	ANEQ784 - Supervised College Teaching	18	22
2013	Spring	ANEQ699 - Thesis	18	9
2012	Fall	AGRI634 - Animal Production Systems	3	16
2012	Fall	AGRI634 - Animal Production Systems-Lab	0	16
2012	Fall	ANEQ575 - Computational Biology in Animal Breeding	3	3
2012	Fall	ANEQ799 - Dissertation	18	8
2012	Fall	ANEQ500 - Recent Developments	6	2
2012	Fall	ANEQ792B - Seminar-Breeding/Genetics	1	5
2012	Spring	AGRI634 - Animal Production Systems	3	24
2012	Spring	ANEQ799 - Dissertation	18	12
2012	Spring	ANEQ487 - Internship	18	20
2012	Spring	ANEQ330 - Principles of Animal Breeding	3	56
2012	Spring	ANEQ500 - Recent Developments	6	1
2012	Spring	ANEQ631 - Selection Index Theory	3	5
2012	Spring	ANEQ631 - Selection Index Theory - Recitation	0	5
2012	Spring	ANEQ784 - Supervised College Teaching	18	18
2012	Spring	ANEQ699 - Thesis	18	10
2011	Fall	AGRI634 - Animal Production Systems	3	16
2011	Fall	AGRI634 - Animal Production Systems-Lab	0	16
2011	Fall	ANEQ799 - Dissertation	18	8
2011	Fall	ANEQ487 - Internship	18	10
2011	Fall	ANEQ500 - Recent Developments	6	3
2011	Fall	ANEQ792B - Seminar-Breeding/Genetics	1	5
2011	Fall	ANEQ699 - Thesis	18	13
2011	Spring	AGRI634 - Animal Production Systems	3	20
2011	Spring	ANEQ799 - Dissertation	18	11
2011	Spring	ANEQ330 - Principles of Animal Breeding	3	35
2011	Spring	ANEQ500 - Recent Developments	6	9
2011	Spring	ANEQ784 - Supervised College Teaching	18	23
2010	Fall	AGRI634 - Animal Production Systems	3	16
2010	Fall	AGRI634 - Animal Production Systems-Lab	0	16
2010	Fall	ANEQ799 - Dissertation	18	14
2010	Fall	ANEQ500 - Recent Developments	6	4
2010	Fall	ANEQ792B - Seminar-Breeding/Genetics	1	5
2010	Summer	ANEQ487 - Internship		16
2010	Spring	AGRI634 - Animal Production Systems	3	7
2010	Spring	ANEQ330 - Principles of Animal Breeding	3	32
2010	Spring	ANEQ500 - Recent Developments	6	8
2010	Spring	ANEQ631 - Selection Index Theory	3	4
2010	Spring	ANEQ631 - Selection Index Theory - Recitation	0	4
2010	Spring	ANEQ784 - Supervised College Teaching	18	23
2010	Spring	ANEQ699 - Thesis	18	15
2009	Fall	AGRI634 - Animal Production Systems	3	11
2009	Fall	AGRI634 - Animal Production Systems	3	5
2009	Fall	AGRI634 - Animal Production Systems-Lab	0	11
2009	Fall	ANEQ500 - Recent Developments	6	5
2009	Fall	ANEQ792B - Seminar-Breeding/Genetics	1	7
2009	Fall	ANEQ699 - Thesis	18	16
2009	Summer	ANEQ487 - Internship	18	17

2009	Spring	ANEQ799 - Dissertation	18	13
2009	Spring	ANEQ487 - Internship	18	12
2009	Spring	ANEQ330 - Principles of Animal Breeding	3	37
2009	Spring	ANEQ500 - Recent Developments	6	3
2009	Spring	ANEQ631 - Selection Index Theory	3	0
2009	Spring	ANEQ631 - Selection Index Theory - Recitation	0	0
2009	Spring	ANEQ784 - Supervised College Teaching	18	20
2009	Spring	ANEQ699 - Thesis	18	14
2008	Fall	AGRI634 - Animal Production Systems	3	19
2008	Fall	AGRI634 - Animal Production Systems-Lab	0	19
2008	Fall	ANEQ500 - Recent Developments	6	4
2008	Fall	ANEQ792B - Seminar-Breeding/Genetics	1	5
2008	Fall	ANEQ699 - Thesis	18	12
2008	Summer	ANEQ487 - Internship	18	19
2008	Spring	ANEQ487 - Internship	18	24
2008	Spring	ANEQ587 - Internship	9	1
2008	Spring	ANEQ330 - Principles of Animal Breeding	3	39
2008	Spring	ANEQ500 - Recent Developments	6	11
2008	Spring	ANEQ631 - Selection Index Theory	3	3
2008	Spring	ANEQ631 - Selection Index Theory-Recitation	0	3
2008	Spring	ANEQ792B - Seminar-Breeding/Genetics	1	6
2007	Fall	AGRI634 - Animal Production Systems	3	10
2007	Fall	AGRI634 - Animal Production Systems-Lab	0	10
2007	Fall	ANEQ575 - Computational Biology in Animal Breeding	3	0
2007	Fall	ANEQ575 - Computational Biology in Animal Breeding	0	0
2007	Fall	ANEQ792B - Seminar: Breeding/Genetics	1	6

Guest Lectures:

<u>Year</u>	<u>Semester</u>	<u>Course No./Title</u>	<u># of Guest Lectures</u>	<u>Delivery Mode</u>
2015	Fall	ANEQ510 - Applied Bovine Reproduction	2	Face to Face
2014	Fall	ANEQ102 - Introduction to Equine Science	1	Face to Face
2014	Spring	ANEQ328 - Foundations in Animal Genetics	1	Face to Face
2013	Fall	ANEQ102 - Introduction to Equine Science	1	Face to Face

EXTENSION/ENGAGEMENT ACTIVITIES/ACCOMPLISHMENTS

Presentation

Genetic Evaluation and Selection: Lost Opportunities for Improving Profit. Oklahoma City, OK. Number of times program was made: 1. Total number of participants: 100. Percent Responsible: 100%. 2013.

How to Read and Utilize EPD. Meeker, CO. Number of times program was made: 1. Total number of participants: 5. Percent Responsible: 100%. 2013.

Operational Efficiency: From RFI to Profit. Loveland, CO. Number of times program was made: 1. Total number of participants: 80. Percent Responsible: 100%. 2013.

Selection for Economically Relevant Traits: Current Research. Fort Collins, CO. Number of times program was made: 1. Total number of participants: 20. Percent Responsible: 30%. 2013.

Understanding and Applying Economically Relevant Traits (ERT) and Indices for the Commercial Cattle Rancher. Rapid City, SD. Number of times program was made: 1. Total number of participants: 400. Percent Responsible: 100%. 2013.

Update on ARI EPD Program. Denver, CO. Number of times program was made: 1. Total number of participants: 50. Percent Responsible: 100%. 2013.

COMMITTEES

ISTeC RAC, (2012 - Present).

Technical Advancement Committee, (2012 - Present).

College of Agriculture Feed Intake Unit Oversight Committee, (2010 - Present).

Department of Animal Sciences Coordinating Committee, (2010 - Present).

John E. Rouse Beef Improvement Center Management Team, (2010 - Present).

IsTec Research Computing Committee, (May 2014 - November 2014).

(2012).

(2011).

Animal Sciences Department Head Search Committee, (2010 - 2011).

(2010).

(2010).

(2010).

College of Agriculture ARDEC Livestock Unit Management Committee, (2014 - Present).

CAS Computer Technology Communication Committee, (2013 - Present).

John E. Rouse Beef Improvement Center Management Team, (2010 - Present).

College of Agriculture Feed Intake Unit Oversight Committee, (2010 - 2015).

(2012).

(2012).

(2011).

Animal Sciences Department Head Search Committee, (2010 - 2011).

(2010).

(2010).

(2010).

Beef Management Systems Search Committee, (September 2015 - Present).

College of Agriculture Feed Intake Unit Oversight Committee, (2010 - Present).

Department of Animal Sciences Coordinating Committee, (2010 - Present).

John E. Rouse Beef Improvement Center Management Team, (2010 - Present).

Curriculum Redesign: Group2, (2013 - 2015).

Equine Genetics Search Committee, (September 2014 - March 1, 2015).

Beef Geneticist Search Committee, (March 11, 2014 - July 1, 2014).

(2012).

(2012).

(2011).

Animal Sciences Department Head Search Committee, (2010 - 2011).

(2010).

(2010).

(2010).

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

American Registry of Professional Animal Scientists.

Beef Improvement Federation. (2003 - Present).

American Society of Animal Sciences. (1997 - Present).

WERA-1--Coordinating committee for beef cattle breeding research. (1997 - Present).

Ag Information Network of the West. (2015).

Heather Thomas--reporter. (December 5, 2014).

Ag Pacific Northwest Radio. (March 19, 2013).

Reviewer, Ad Hoc Reviewer, Canadian Journal of Animal Science. (2012 - Present).

Reviewer, Ad Hoc Reviewer, Journal of Animal Science. (2012 - Present).

Reviewer, Ad Hoc Reviewer, Canadian Agricultural Adaptation Program. (2010 - Present).

Reviewer, Ad Hoc Reviewer, Canadian Journal of Animal Science. (2010 - Present).

College of Agriculture Feed Intake Unit Oversight Committee. (2010 - Present).

Member, Computer Technology and Telecommunications. (2010 - Present).

CSU Shotgun Sports Club Faculty Advisor. (2010 - Present).

Department of Animal Sciences Coordinating Committee. (2010 - Present).

John E. Rouse Beef Improvement Center Management Team. (2010 - Present).

USDA Fact Sheet. (2010 - Present).

Member, Western Center for IRM Management Committee. (2010 - Present).

Core Committee for Beef Tec. (2009 - Present).

Member, Animal Sciences Website Committee. (2003 - Present).

Beef Improvement Federation. (2003 - Present).

Committee Chair, Beef Improvement Federation. (2003 - Present).

Member, American Society of Animal Sciences. (1997 - Present).

Member, WERA-1--Coordinating committee for beef cattle breeding research. (1997 - Present).

CSU Shotgun Sports Club Faculty Advisor. (2012).

Interview with KayDee Gilkey on Genetics of Cattle Health. Interview ran on 30 radio stations in Washington, Idaho and Oregon. (2012).

CSU Shotgun Sports Club Faculty Advisor. (2011).

Interview with Catherine Brown for the Ontario Beef Farmer Magazine article on cattle health. (2011).

Animal Sciences Department Head Search Committee. (2010 - 2011).

Member, Rouse Chair in Animal Breeding and Genetics Chair Search Committee. (2010 - 2011).

Member, Journal of Animal Science. (2009 - 2011).

Center for Genetic Evaluation of Livestock, Fort Collins, CO. (2010).

Interview with Katie Boeder of CSU for the College of Agriculture Sciences newsletter. (2010).

Interview with Terri Queck-Matzie on bovine respiratory disease and practices for reduction in the feedlot. (2010).

Interview with William Vincent of ISU on future practices for feedlot production. (2010).

OTHER ACTIVITIES/ACCOMPLISHMENTS – SERVICE/OUTREACH

Non-Governmental Organization (NGO), Alpaca Registry, Inc., Lincoln, NE, United States. (2013 - Present).

Non-Governmental Organization (NGO), Paco-Vicuna Association. (2013 - Present).

Alpaca Registry, Inc. (2013).

Non-Governmental Organization (NGO), Alpaca Registry, Inc., Lincoln, NE. (2012).

Suri Network. (2012).

Alpaca Registry, Inc. (2011).

Suri Network. (2011).

Alpaca Registry, Inc. (2010).

Suri Network. (2010).

Scholastic Clay Target Program. (2012 - Present).

Scholastic Clay Target Program. (2011 - Present).

Scholastic Clay Target Program. (2010 - Present).

Colorado Skeet Shooting Association. (2012 - 2013).

Colorado Skeet Shooting Association. (2011 - 2013).

Colorado Skeet Shooting Association. (2010 - 2013).
