

## CURRICULUM VITAE

### NAME

Engle, Terry E

### ADDRESS

Animal Sciences  
College of Agricultural Sciences

Animal Sciences

### PHONE

(970) 491-3597

### EDUCATION

1999 Ph D, North Carolina State University

1996 MS, Colorado State University

1993 BS, Colorado State University

### ACADEMIC POSITIONS

July 1, 2009 - Present Professor, Colorado State University.

### OTHER POSITIONS

August 2009 - Present Affiliate Faculty, Colorado State University.

July 2005 - June 2009 Associate Professor, Colorado State University.

December 1999 - June 2005 Assistant Professor, Colorado State University.

### PUBLISHED WORKS

#### **Refereed Journal Articles**

Desimone, T. L., Acheson, R. A., Woerner, D. R., Engle, T. E., Douglass, L. W., Belk, K. E. Nutrient analysis of the Beef Alternative Merchandising cuts. *Meat Science*, 93, 733-745.

Martin, J. N., Brooks, J. C., Thompson, L. D., Savell, J. W., Harris, K. B., May, L. L., Haneklaus, A. N., Schutz, J. L., Belk, K. E., Engle, T. E., Woerner, D. R., Legako, J. F., Luna, A. M., Douglass, L. W., Douglass, S. E., Howe, J., Duvall, M., Patterson, K. Y., Leheska, J. L. Nutrient Database Improvement Project: The influence of U.S. quality and yield grade on the separable components and proximate composition of raw and cooked retail cuts from the beef rib and plate. *Meat Science*, 95, 486-494.

Domby, E. M., Schutz, J. S., Wagner, J. J., Engle, T. E., Neuhold, K. L., Woerner, D. R., Branine, M. E. The effect of medicinal feed additive programs and dietary sulfur concentrations in steam-flaked corn diets containing wet distillers grains on performance and carcass merit in yearling feedlot steers. *Professional Animal scientist*, 29, 566-574.

Seabrook, J.L., Peel, R. K., Engle, T. E. The effects of replacing dietary carbohydrate with calcium salts of fatty

- acids on finishing lamb feedlot performance, blood metabolites, muscle fatty acid composition, and carcass characteristics. *Small Ruminant Res*, doi:10.1016/j.smallrumres.2010.10.009.
- O'Quinn, T. G., Woerner, D. R., Engle, T. E., Chapman, P. L., Legako, J. F., Brooks, J. C., Belk, K. E., Tatum, J. D. (2016). Identifying consumer preferences for specific beef flavor characteristics in relation to cattle production and postmortem processing parameters. *Meat Science*, 112, 90-102.
- Wagner, J. J., Engle, T. E., Belknap, C. R., Dorton, K. L. (in press). Meta-analysis examining the effects of *Saccharomyces cerevisiae* fermentation products on feedlot performance and carcass traits. *Prof. Anim. Scientist*.
- Barrett, C., Wagner, J., Neuhold, K., Caldera, E., Sellins, K., Engle, T. (2015). Comparison of National Research Council standards and industry dietary trace mineral supplementation strategies for yearling feedlot steers. *PLoS ONE*.
- Costa, L., Filho, S., Engle, T., Rota, P., Marcondes, M., Silva, F., Martins, E., Tokunaga, A. (2015). Macrominerals and Trace Element Requirements for Beef Cattle. *Journal*.
- Schwandt, E. F., Wagner, J. J., Engle, T. E., Bartle, S. J., Thomson, D. U., Reinhardt, C. D. (in press). The effects of dry-rolled corn particle size on performance, carcass traits, and starch digestibility in feedlot finishing diets containing wet distiller's grains. *Journal of animal science*.
- Gordon, B., Hahm, S.-w., Wagner, J. J., Jennings, J., Engle, T. E., Han, H. *Aspergillus oryzae*  $\alpha$ -amylase supplementation on rumen volatile fatty acid profile and relative abundance of mRNA associated with nutrient absorption in ruminal and duodenal tissue from beef steers. *Professional Animal Scientist*.
- Berrett, C. J., Wagner, J. J., Neuhold, K. L., Caldera, E., Sellins, K. S., Engle, T. E. (2015). Comparison of National Research Council standards and industry dietary trace mineral supplementation strategies for yearling feedlot steers. *Prof. Anim. Scientist*, 31, 237-247.
- Field, M. E., Anthony, R. V., Engle, T. E., Archibeque, S. L., Keisler, D. H., Han, H. (2015). Duration of maternal undernutrition differentially alters fetal growth and hormone concentrations. *Domestic animal endocrinology*, 51, 1-7.
- Repenning, P.E., Ahola, J. K., Callan, R. J., French, J.T., Giles, R.L., Peel, R. K., Whittier, J. C., Fox, J.T., Engle, T. E. (2013). Effects of method of castration and pain mitigation on behavior and feedlot performance in cull beef bulls. *Journal of Animal Science, Proceedings, Western Section, American Society of Animal Sciences, July 16th, 2012: Phoenix, Arizona*, 91, 4975-4983.
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- (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.
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- (2011). Quantifying the “aging response” and nutrient composition for muscles of the beef round. *Anim Sci* *jas.2011-4415*.
- (2011). The effects of distance traveled during loading, lariat time prior to slaughter, and distance traveled to the stunning area on blood lactate concentrations of pigs in a commercial packing plant. *Prof Anim Sci*, 27, 485-491.
- (2011). The effects of replacing dietary carbohydrate with calcium salts of fatty acids on finishing lamb feedlot performance, blood metabolites, muscle fatty acid composition, and carcass characteristics. *Small Ruminant Res*, 85, 97-103.
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- (2010). Effect of dietary supplemental vitamin A concentration on performance, carcass merit, serum metabolites, and lipogenic enzyme activity in yearling beef steers. *J Anim Sci*, 88, 1463-1478.
- (2010). Effect of visual marbling on sensory properties and quality traits of pork loin. *Meat Sci*, 85, 428-434.
- (2010). Effects of sex and short-term magnesium supplementation on stress responses and longissimus muscle quality characteristics of crossbred cattle. *J Anim Sci*, 88, 349-360.
- (2010). Effects of Trace Mineral Source and Growth Implants on Trace Mineral Status of Growing and Finishing Feedlot Steers. *Asian-Aust J Anim Sci*, 23, 907 - 915.
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- (2006). Effects of ractopamine supplementation on behavior of British, Continental, and Brahman crossbred steers during routine handling. *J Anim Sci*, 84, 3410-3414.
- (2006). Effects of trace mineral supplementation and source, 30 days post-weaning and 28 days post receiving, on performance and health of feeder cattle. *Asian Austral J Anim*, 19, 1450-1454.
- (2006). Evaluation of milk somatic cells as a source of mRNA for study of lipogenesis in the mammary gland of lactating beef cows supplemented with dietary high-linoleate safflower seeds. *J Anim Sci*, 84, 2399-2405.
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- (2005). Evaluation of milk somatic cells as a source of mRNA for study of mammary gland lipogenesis in lactating beef cows. *J Anim Sci*, 83, 123-123.
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- (2003). The effect of vitamin E supplementation on discoloration of injection-site lesions in retail cuts and the greening reaction observed in injection-site lesions in muscles of the chuck. *J Anim Sci*, 81, 1885-1894.
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- (1997). Zinc repletion with organic or inorganic forms of zinc and protein turnover in marginally zinc-deficient calves. *J Anim Sci*, 75, 3074-3081.
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### **Refereed Proceedings or Transactions**

- Seabrook, J.L., Peel, R. K., Engle, T. E. *Effects of Calcium Salts of Fatty Acids on Finishing Lamb Feedlot Performance and Carcass Characteristics*. Poster presented at the 2009 Joint Annual Meeting of ADSA, CSAS, and ASAS, July 15, 2009: Montreal, Quebec, Canada.
- Austin, K.J., Seabrook, J.L., Engle, T. E., Peel, R. K., McAllister, C.M., Brigham, B.W. *The Effect of Morbidity on Feedlot Performance and Carcass Quality in Feedlot Steers*. Joint Annual Meeting ADSA, PSA, AMPA, CSAS, WSASAS, ASAS, July 11: Denver, CO.

### **Non-Refereed Journal Articles**

- Gee\*, E. K., Bruemmer, J. E., Siciliano, P. D., Morel, P. C. H., Engle, T. E., Squires, E. L. The Influence of Dietary Vitamin E on Serum Vitamin E and Fatty Acids, and Spermatozoa Fatty Acids in Stallions. *Journal of Equine Veterinary Science*, 29(5), 334-336. <http://dx.doi.org/10.1016/j.jevs.2009.04.043>

- Warner, C., Hamn, W., Archibeque, S. (2015). A comparison of supplemental calcium soap of palm fatty acids versus tallow in a corn-based finishing diet for feedlot steers. *J. Anim. Sci. and Technol.*.
- Costa, L., Engle, T., Filho, S., Valadares, R., Silva, B., Pacheo, M. (2015). Apparent digestibility, and nutritional requirements of growing Nellore heifers and steers fed two levels of calcium and phosphorus. *Livestock Sci.*
- Field, M., Anthony, R., Engle, T., Archibeque, S., Keisler, D., Han, H. (2015). Duration of maternal undernutrition differentially alters fetal growth and hormone concentrations. *Domestic Animal Endocrinology.*
- Rota, P., Filho, S., Gionbelli, T., Costa, L., Engle, T., Marcondes, M., Machado, F., Villadiego, Silva, L. (2015). Effects of day of gestation and feeding regimen in Holstein × Gyr cows: I. Apparent total-tract digestibility, nitrogen balance, and fat deposition. *Journal of Dairy Science.*
- Rota, P., Filho, S., Gionbelli, Costa, L., Engle, T., Marcondes, M., Machado, F., Villadiego, F., Silva, L. (2015). Effects of day of gestation and feeding regimen in Holstein × Gyr cows: II. Maternal and fetal visceral organ mass. *Journal of Dairy Science.*
- Rotta, P., Filha, S., Goibelli, T., Costa, L., Engle, T., Marcondes, M., Guimaraes, S., Nascimento, C., Carvalho, B., Silva, F., Oliverira, J. (2015). Effects of stage of gestation and feeding regimen in Holstein × Gyr cows: III. Placental adaptations and placentome gene expression. *Journal of Dairy Science.*
- Costa, L., Engle, T., Filho, S., Rota, P., Villadiego, F., Silva, F., Martins, E., Silva, L., Paulino, M. (2015). Nellore cows and their calves during the lactation period: performance, intake, milk composition, and total apparent digestibility. *Trop. Anim. Health Prod.*.
- Roseland, J., Nguyne, Q., Williams, J., Douglass, L., Patterson, K., Howe, J., Brooks, J., Thompson, L., Woerner, D., Engle, T., Savell, J., Gehring, K., Cifelli, A., McNeil, S. (2015). Protein, fat, moisture, and cooking yields for a U.S. study of retail beef cuts. *Journal.*
- Acheson, R. J., Woerner, D. R., Martin, J., Belk, K. E., Engle, T. E., Brown, T. R., Brooks, J. C., Luna, A. M., Thompson, L., Grimes, H. L., Arnold, A. N., Savell, J. W., Gehring, K. B., Douglass, L. W., Howe, J. C., Patterson, K. Y., Roseland, J. M., Williams, J. R., Cifelli, A., Leheska, J. M., McNeill, S. H. (2015). Nutrient database improvement project: Separable components and proximate composition of raw and cooked retail cuts from the beef loin and round. *Meat science, 110*, 236-44.
- Roseland, J. M., Nguyen, Q. R., Williams, J. R., Douglass, L. W., Patterson, K. Y., Howe, J. C., Books, J. C., Thompson, L. D., Woerner, D. R., Engle, T. E., Savell, J. W., Gerring, K. B., Cefelli, A. M., McNeill, S. H. (2015). Protein, fat, moisture and cooking yields from a U.S. study of retail beef cuts. *J. Food Composition and Analysis.*
- Warner, C. M., Hahm, S. W., Archibeque, S. L., Wagner, J. J., Engle, T. E., Roman-Muniz, I. N., Woerner, D. R., Sponsler, M., Han, H. (2015). A comparison of supplemental calcium soap of palm fatty acids versus tallow in a corn-based finishing diet for feedlot steers. *Journal of animal science and technology, 57*, 25.
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- Ross, T. N., Hess, T. M., Rexford, J., Ahrens, N., Engle, T. E., Hansen, D. K. Effects of omega (ω)-3 long chain polyunsaturated fatty acid supplementation on equine synovial fluid fatty acid composition and prostaglandin E2. *Journal of Equine Veterinary Science, 34*, 779-783.
- Martin, J., Brooks, J. C., Thompson, L., Savell, J. W., Harris, K. B., May, L. L., Haneklaus, A. N., Schutz, J. L.,

- Belk, K. E., Engle, T. E., Woerner, D. R., Legako, J. F., Luna, A. M., Douglass, L. W., Douglass, S. E., Howe, J., Duvall, M., Patterson, K. Y., Leheska, J. L. (2013). Nutrient database improvement project: the influence of U.S.D.A. Quality and Yield Grade on the separable components and proximate composition of raw and cooked retail cuts from the beef rib and plate. *Meat science*, 95(3), 486-94.
- Sexson, J. L., Wagner, J. J., Engle, T. E., Eickhoff, J. (2012). Predicting water intake by yearling feedlot steers. *Journal of animal science*, 90(6), 1920-8.
- White, N. R., Burns, P. D., Cheatham, R. D., Romero, R., Nozykowski, J. P., Bruemmer, J. E., Engle, T. E. (2012). Fish meal supplementation increases bovine plasma and luteal tissue omega-3 fatty acid composition. *Journal of animal science*, 90(3), 771-8.
- Dixon, C. L., Woerner, D. R., Tokach, R. J., Chapman, P. L., Engle, T. E., Tatum, J. D., Belk, K. E. (2012). Quantifying the aging response and nutrient composition for muscles of the beef round. *Journal of animal science*, 90(3), 996-1007.
- 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.
- Woerner, D. R., Tatum, J. D., Engle, T. E., Belk, K. E., Couch, D. W. (2011). Effects of sequential implanting and ractopamine hydrochloride supplementation on carcass characteristics and longissimus muscle tenderness of calf-fed steers and heifers. *Journal of animal science*, 89(1), 201-9.
- Cannata, S., Engle, T. E., Moeller, S. J., Zerby, H. N., Radunz, A. E., Green, M. D., Bass, P. D., Belk, K. E. (2010). Effect of visual marbling on sensory properties and quality traits of pork loin. *Meat science*, 85(3), 428-34.
- Gruber, S. L., Tatum, J. D., Engle, T. E., Chapman, P. L., Belk, K. E., Smith, G. C. (2010). Relationships of behavioral and physiological symptoms of preslaughter stress to beef longissimus muscle tenderness. *Journal of animal science*, 88(3), 1148-59.
- Bass, P. D., Engle, T. E., Belk, K. E., Chapman, P. L., Archibeque, S. L., Smith, G. C., Tatum, J. D. (2010). Effects of sex and short-term magnesium supplementation on stress responses and longissimus muscle quality characteristics of crossbred cattle. *Journal of animal science*, 88(1), 349-60.
- Wright, L. I., Scanga, J. A., Belk, K. E., Engle, T. E., Tatum, J. D., Person, R. C., McKenna, D. R., Griffin, D. B., McKeith, F. K., Savell, J. W., Smith, G. C. (2005). Benchmarking value in the pork supply chain: Characterization of US pork in the retail marketplace. *Meat science*, 71(3), 451-63.
- Roeber, D. L., Belk, K. E., Engle, T. E., Field, T. G., Koontz, S. R., Scanga, J. A., Tatum, J. D., Mason, G. L., Van Metre, D. C., Garry, F. B., Smith, G. C. (2003). The effect of vitamin E supplementation on discoloration of injection-site lesions in retail cuts and the greening reaction observed in injection-site lesions in muscles of the chuck. *Journal of animal science*, 81(8), 1885-94.
- Neuhold, K.L., Grubb, P.T., Wagner, J. J., Engle, T. E., Peel, R. K., Schroeder, A.L. *Effectiveness of Ractopamine When Fed as a Top Dress in Beef Steers*. Joint Annual Meeting ADSA, PSA, AMPA, CSAS, WSASAS, ASAS, July 11, 2010: Denver, CO.
- Gordon, B. N., Hahm, H. A., Wagner, J. J., Jennings, J. S., Han, H., Engle, T. E. (2014). *Supplementation of Aspergillus oryzae  $\alpha$ -amylase on ruminal volatile fatty acid distribution and digestive tract gene expression in beef steers fed a steam-flaked corn based finishing diet*. (E-Suppl 2 ed., vol. 92, pp. 885). J Anim Sci.
- (2012). *An in vitro evaluation of rumen fluid type on hydrogen sulfide production of common beef cattle feedstuffs*

- (Suppl3 ed., vol. 90, pp. 132-133). J Anim Sci.
- (2012). *Blood glucose and acylated ghrelin in response to duration of maternal undernutrition during gestation in twin sheep pregnancies* (Suppl3 ed., vol. 90, pp. 181). J Anim Sci.
- (2012). *Comparison of receiving strategies on feedlot performance in beef calves at weaning* (Suppl3 ed., vol. 90, pp. 219). J Anim Sci.
- (2012). *Dietary antioxidant (Agrado Plus) sparing vitamin E in nursery pigs fed distillers dried grains with solubles (DDGS)* (Suppl3 ed., vol. 90, pp. 495). J Anim Sci.
- (2012). *Effect of zinc concentration on performance and carcass characteristics of feedlot steers* (Suppl3 ed., vol. 90, pp. 371). J Anim Sci.
- (2012). *Effects of algal meal supplementation to finishing wethers on performance and carcass characteristics* (Suppl3 ed., vol. 90, pp. 148). J Anim Sci.
- (2012). *Effects of dietary Aspergillus oryzae extract containing  $\alpha$ -amylase activity on feedlot performance and carcass characteristics of finishing beef cattle fed steam-flaked corn-based diets* (Suppl3 ed., vol. 90, pp. 670). J Anim Sci.
- (2012). *Effects of pain mitigation and method of castration on behavior and feedlot performance in cull beef bulls* (Suppl3 ed., vol. 90, pp. 150-151). J Anim Sci.
- (2012). *Individual differences in calf defense pattern in Red Angus beef cows* (Suppl3 ed., vol. 90, pp. 219). J Anim Sci.
- (2012). *Lamb growth in response to the duration of maternal undernutrition during gestation in twin sheep pregnancies* (Suppl3 ed., vol. 90, pp. 51-52). J Anim Sci.
- (2012). *Meta-analysis examining the effects of Saccharomyces cerevisiae fermentation product on feedlot performance and carcass traits*. J Anim Sci Midwest meetings.
- (2012). *Updating the United States National Nutrient Database with nutrient data for eight cooked beef cuts*. 58th International Congress of Meat Science and Technology Montreal, Canada.
- (2011). *Effects of a feed supplement containing long chain 18C-n-3 fatty acid and chromium on insulin sensitivity in old mares: A preliminary study*. Equine Sciences Society Annual meeting.
- (2011). *Effects of copper concentration and source on performance, bile components, copper metabolism and gastrointestinal microbial distribution in nursery swine* (Suppl 1 ed., vol. 89, pp. 585). Anim Sci.
- (2011). *Effects of variable maternal undernutrition on uterine and umbilical IGF-I, insulin, and ghrelin concentrations in near-term sheep twin pregnancies* (Suppl 1 ed., vol. 89, pp. 560). Anim Sci.
- (2011). *Effects of zinc and copper source and concentration on feedlot performance and carcass characteristics in yearling steers* (Suppl 1 ed., vol. 89, pp. 451). Anim Sci.
- (2011). *Han Insulin-like growth factor-I (IGFI), IGF binding proteins (IGFBP), and growth hormone receptor (GHR) mRNA concentration in fetal liver and duodenum in response to variable maternal nutrition during gestation* (Suppl 1 ed., vol. 89, pp. 560). Anim Sci.
- (2011). *Repeatability of subjective and objective measures of exit velocity as an indicator of temperament in feedlot cattle* (Suppl1 ed., vol. 89, pp. 466). Anim Sci.

- (2011). *The effect of beta-agonists on feedlot performance and carcass* (Suppl 1 ed., vol. 89, pp. 502). Anim Sci.
- (2011). *The effect of feed additive program and dietary sulfur concentration in steam-flaked corn diets containing wet distiller's grains on feedlot performance and carcass merit in yearling feedlot steers* (Suppl 1 ed., vol. 89, pp. 360-361). Anim Sci.
- (2011). *The effect of feed additive and sulfur intake on rumen fluid pH and rumen gas cap hydrogen sulfide concentration in feedlot steers* (Suppl 1 ed., vol. 89, pp. 360-361). Anim Sci.
- (2011). *Updating nutrient data for beef chuck cuts*. Texas Dietetic Association Food and Nutrition Conference and Exhibition, Translating Trends into Reality for Dietetic Professionals, Houston, TX April 7 -9.
- (2010). *Calcium and phosphorus metabolism in finishing steers supplemented with vitamin D3* (vol. 60, pp. 60-63). Western Section American Society of Animal Science Proceedings.
- (2010). *Calcium and phosphorus in finishing steers supplemented with vitamin D3* (Suppl2 ed., vol. 88, pp. 7). J Anim Sci.
- (2010). *Comparison of pig restraint and sampling methods on blood lactate concentrations* (Suppl2 ed., vol. 88, pp. 306). J Anim Sci.
- (2010). *Duration of maternal undernutrition differentially alters fetal development and metabolism in twin sheep pregnancies* (Suppl2 ed., vol. 88). J Anim Sci.
- (2010). *Effectiveness of ractopamine when fed as a top dress in beef steers* (Suppl2 ed., vol. 88, pp. 295). J Anim Sci.
- (2010). *Effects of omega-3 fatty acid supplementation on plasma, red blood cell and muscle cell fatty acid compositions in horses* (Suppl2 ed., vol. 88, pp. 762). J Anim Sci.
- (2010). *Effects of two-stage and total vs fenceline weaning on the physiology and performance of beef calves* (Suppl2 ed., vol. 88, pp. 107). J Anim Sci.
- (2010). *Fatty acid composition of synovial fluid in horses fed long chain polyunsaturated fatty acids: A pilot study* (Suppl 2 ed., vol. 88, pp. 761). J Anim Sci.
- (2010). *Fatty acid composition of synovial fluid in horses fed long chain polyunsaturated fatty acids: A pilot study* (Suppl2 ed., vol. 88, pp. 761). J Anim Sci.
- (2010). *Interactions of trace minerals and immunity in ruminants* (pp. 8-Jan). California Animal Nutrition Conference (CANC).
- (2010). *The effect of morbidity on feedlot performance and carcass quality on feedlot steers* (Suppl2 ed., vol. 88, pp. 10). J Anim Sci.
- (2010). *The effect of supplemental molybdenum and copper on the concentrations of hydrogen sulfide in the rumen gas cap and copper in the liver of yearling steers* (Suppl2 ed., vol. 88, pp. 511). J Anim Sci.
- (2010). *The influence of dietary protein regimes on crude protein and dry matter apparent digestibility in steers fed a steam-flaked corn based diet* (Suppl2 ed., vol. 88, pp. 573). J Anim Sci.
- (2010). *The relationship of tissue copper concentrations and genes involved in copper homeostasis in the cow, pig, and goat* (Suppl 2 ed., vol. 88, pp. 403). J Anim Sci.
- (2010). *Trace mineral metabolism in ruminants* (Suppl2 ed., vol. 88, pp. 510). J Anim Sci.

## Abstract

- Adams, T. S., Woerner, D. R., Legako, J. F., Engle, T. E., Tatum, J. D., Delmore, R., Belk, K. E. (2015). *Identifying the influence of cattle production history and lean muscle characteristics on specific beef flavor attributes* (vol. 112, pp. 149-150). Meat Science.
- Warner, C. M., Archibeque, S. L., Engle, T. E., Wagner, J. J., Woerner, D. R., Han, H. (2015). *Supplementation of rumen-protected PUFA in corn-fed beef steers*. (Suppl. 2 ed., vol. 91, pp. 236). Journal of Animal Science.
- Schwandt, E. F., Reinhardt, C. D., Thomson, D. U., Bartle, S. J., Engle, T. E., Wagner, J. J. (2015). *The effect of dry-rolled corn particle size on feed efficiency in feedlot finishing diets containing wet distiller's grains*. Plains Nutrition Council.
- Caldera, E., Wagner, J. J., Sellins, K. S., Engle, T. E., Laudert, S. B., Spears, J. (2014). *Effects of supplemental zinc, copper, and manganese concentration and source on performance and carcass characteristics of feedlot steers*. (E-Supple 2 ed., vol. 92, pp. 342). J. Anim. Sci..
- Webb, M., Woerner, D. R., Pendell, D. L., Engle, T. E., Henson, J., Zerby, H., Delmore, R., Belk, K. E., Tatum, J. D. (in press). *Identifying consumer preferences for different beef types based on flavor*. Meat Science.
- Caldera, E., Wagner, J. J., Sellins, K. S., Engle, T. E., Laudert, S. B., Spears, J. W. (2014). *Effects of supplemental zinc, copper, and manganese concentration and source on performance and carcass characteristics of feedlot steers*. Plains Nutrition Council.
- Gordon, B. N., Hahm, S. W., Wagner, J. J., Jennings, J. S., Han, H., Engle, T. E. (2014). *Examining the impact of Aspergillus oryzae  $\alpha$ -amylase supplementation on rumen volatile fatty acid profile and relative abundance of mRNA associated with nutrient absorption in ruminal and duodenal tissue from beef steers*. Plains Nutrition Council.

## Book Review

- (2012). *In: Animal Welfare in Animal Agriculture: Husbandry, Stewardship, and Sustainability on Animal Production*. Eds: W G Pond, F W Bazer, and B E Rollin CRC Press Boca Raton, FL USA Pp175-181 (ISBN 978-1-4398-4842-5).

## Manuscript

- Warner, C., Archibeque, S. L., Wagner, J. J., Engle, T. E., Roman-Muniz, I. N., Woerner, D. R., Sponsler, M., Han, H. *Supplementation of Rumen-Protected PUFA in Corn-Fed Beef Steers*†. Journal of Animal Science and Technology.
- Gordon, B., Hahm, S.-W., Wagner, J. J., Jennings, J., Han, H., Engle, T. E. *Supplementation of Aspergillus oryzae  $\alpha$ -amylase on ruminal volatile fatty acid distribution and digestive tract gene expression in beef steers fed a steam-flaked corn based finishing diet*. Canadian Journal of Animal Science.
- Field, M., Anthony, R. V., Engle, T. E., Archibeque, S. L., Keisler, D., Han, H. *Duration of maternal undernutrition differentially alters fetal growth, umbilical blood gas, glucose and hormone concentrations*. Domestic Animal Endocrinology.

## Research Report

- Wagner, J. J., Schwandt, E. F., Engle, T. E., Reinhardt, C. D. (2015). *The effect of dry-rolled corn particle size on feed efficiency in feedlot finishing diets containing 20% (DMB) wet distiller's grain*. Private Industry Report.

**PERFORMANCES, EXHIBITS, PRODUCTIONS (Visual/Performing Arts):**

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

- October 28, 2015, "Feedlot Nutrition", American Association of Bovine Practitioners Club, American Association of Bovine Practitioners Club CSU Veterinary Students, VTH.
- October 8, 2015, "Short course on dairy cattle nutrition and nutrition", Cochran Fellowship Program, Cochran Fellowship Program, CSU.
- September 29, 2015, "Hands-on demonstration about rumen metabolism and nutrition", Poudre High School Students Biology Class, CSU, ARDEC.
- July 9, 2015, "Hands-on demonstration about rumen metabolism and nutrition", Pre-College Summer Sustainability Program for SoGES, SoGES, ARDEC.
- June 23, 2015, "Hands-on demonstration about rumen metabolism and nutrition", Ute Mountain Ute Youth Leadership Conference, CSU, ARDEC.
- June 10, 2015, "Hands-on demonstration about rumen metabolism and nutrition", Agriculture professionals from Eurasia, Genex, ARDEC.
- February 25, 2015, "Short-course Mineral metabolism in ruminants", University of Vicosa, Brazil, (Presenter) Engle, T. E., University of Vicosa.
- February 2, 2015, "Copper and selenium metabolism and supplemental strategies for beef cattle", Florida Ruminant Nutrition Conference, University of Florida, Gainesville, FL.
- 2014, "2014, Italian High Education Training Course on "Ethics, Animal Welfare and Veterinary Profession - Ranch and dairy tour and presentation. Fort Collins, CO.", (Presenter) Engle, T. E., Fort Collins.
- July 2014, "Fistulated Steer Demonstration", Skinner Middle School, Fort Collins.
- July 22, 2014, "Supplementation of *Aspergillus oryzae* on ruminal volatile fatty acids composition and digestive tract gene expression in beef steers fed flaked corn based finishing diet", American Society of Animal Sciences Annual Meeting, American Society of Animal Sciences, (Presenter) Hahn, S.-w., Kansas City, KS, peer-reviewed/refereed.
- June 2014, "The Role of Trace Minerals in Lipid Metabolism, Carcass Characteristics, and Health in Feedlot Cattle", TEMA 15, University of Florida, Orlando, FL.
- March 2014, "Influence of carbohydrate and protein source on feedlot cattle performance- a review; The role of trace minerals in lipid metabolism, carcass characteristics, and health in feedlot cattle", XVIII Curso Novos Enfoques Na Producao E Reproducao De Bovinos, Comapeca, Uberlandia, Brazil.
- July 8, 2013, "Supplementation of Rumen Protected PUFA in Corn Fed Beef Steers", American Society of Animal Sciences Joint Annual Meeting, American Society of Animal Science, (Presenter) Warner, C., Indianapolis, peer-reviewed/refereed.
- July 7, 2013, "Comparison of NRC and industry dietary trace mineral standards for yearling feedlot steers.", Joint Annual Meetings, American Society of Animal Science, (Presenter) Berrett, C. J., Indianapolis, IN, peer-reviewed/refereed.
- July 7, 2013, "Effect of ensiling high moisture corn with aspen wood byproducts on in situ dry matter disappearance of the final ensiled product.", Joint Annual Meetings, American Society of Animal Science,

(Presenter) Caldera, E., Indianapolis, IN, peer-reviewed/refereed.

July 7, 2013, "The effect of *Aspergillus oryzae* extract on feedlot performance and carcass merit in yearling steers fed steam-flaked corn based finishing diets.", Joint Annual Meetings, American Society of Animal Science, (Presenter) White, K. A., Indianapolis, IN, peer-reviewed/refereed.

March 22, 2013, "Meta-analysis examining the effects of *Saccharomyces cerevisiae* fermentation product on feedlot performance and carcass traits.", MW American Society of Animal Sciences, American Society of Animal Sciences, (Presenter) Wagner, J. J., Des Moines, IA, peer-reviewed/refereed.

2012, "2012, Hosted Sunflower Butte representatives at CSU. Fort Collins, CO."

2012, "2012, Italian High Education Training Course on "Ethics, Animal Welfare and Veterinary Profession - Ranch and dairy tour and presentation. Fort Collins, CO."

2012, "2012, Kentucky Cattlemen's Meeting at ARDEC. Presentation Title: CSU Beef Nutrition Update. Fort Collins, CO."

2012, "Presentation titles: 1) Water quality and livestock production (presentation to producers); and 2) College and careers (presentation to high school students)."

2011, "2011, Junior Red Angus Association. Presentation title: Emerging social ethics and animal agriculture. Denver, CO."

2011, "2011, Centauri High School Campus visit – Alliance Partnership. Presentation title: Animal Science, Fort Collins, CO."

2011, "2011, Euthanasia research review workshop: Presentation title: Evaluation and application of humane hypoxia euthanasia for suckling and nursery pigs via Webex. Des Moines, IA."

2011, "2011, Leman Conference. Presentation title: Evaluation and application of humane hypoxia euthanasia for suckling and nursery pigs. St. Paul, MN."

2011, "2011, Southwest nutrition and management conference. Presentation

title: Mineral requirements in feedlot cattle. Tempe, AZ."

2011, "2011, USMEF Mexico Team: Presentation title: Feedlot nutrition and wet laboratory, Fort Collins, CO."

2011, "2011, W-1173 – Impacts of Stress Factors on Performance, Health, and Well-being of Farm Animals. Presentation title: Update on farm animal stress physiology research at CSU. Kona, HI."

2010, "Beef cattle nutrition."

2010, "Interactions of trace minerals and immunity in ruminants."

2010, "Research update and discussion."

2010, "Trace mineral metabolism in ruminants."

2006, "Influence of trace mineral and health status, geographic location and BVDV PI exposure on ranch level feedlot performance".

## TEACHING:

<u>Year</u>	<u>Semester</u>	<u>Course No./Title</u>	<u>Cr. Hrs.</u>	<u>Enrollment</u>
2016	Summer	ANEQ522 - Animal Metabolism	3	0
2016	Spring	ANEQ799 - Dissertation	18	11
2016	Spring	ANEQ495 - Independent Study	18	13
2016	Spring	ANEQ487B - Internship: Equine	6	21
2016	Spring	ANEQ784 - Supervised College Teaching	18	31
2016	Spring	ANEQ699 - Thesis	18	9
2016	Spring	ANEQ104 - Values, Culture, and Food Animal Agriculture	3	7
2016	Spring	ANEQ621 - Vitamin and Mineral Metabolism	3	14
2015	Fall	ANEQ522 - Animal Metabolism	3	37
2015	Fall	ANEQ345 - Principles of Nutrition: Equine Applications	3	27
2015	Summer	ANEQ522 - Animal Metabolism	3	0
2015	Summer	ANEQ487B - Internship: Equine	6	43
2015	Spring	VM757 - Bovine Herd Medicine	3	52
2015	Spring	ANEQ495 - Independent Study	18	13
2015	Spring	ANEQ384 - Supervised College Teaching	5	18
2015	Spring	ANEQ104 - Values, Culture, and Food Animal Agriculture	3	10
2015	Spring	ANEQ/PHIL104 - Values, Culture, and Food Animal Agriculture	3	10
2015	Spring	PHIL104 - Values, Culture, and Food Animal Agriculture	3	3
2015	Spring	ANEQ323 - Zoo Nutrition	2	12
2014	Fall	ANEQ522 - Animal Metabolism	3	31
2014	Fall	ANEQ345 - Principles of Nutrition: Equine Applications	3	18
2014	Fall	ANEQ384 - Supervised College Teaching	5	26
2014	Summer	ANEQ522 - Animal Metabolism	3	0
2014	Summer	ANEQ487A - Internship: Animal	6	36
2014	Spring	VM757 - Bovine Herd Medicine	3	48

2014	Spring	ANEQ799 - Dissertation	18	6
2014	Spring	ANEQ495 - Independent Study	18	8
2014	Spring	ANEQ487A - Internship: Animal	6	35
2014	Spring	BMS498 - Research	3	5
2014	Spring	ANEQ699 - Thesis	18	8
2014	Spring	ANEQ104 - Values, Culture, and Food Animal Agriculture	3	7
2014	Spring	ANEQ621 - Vitamin and Mineral Metabolism	3	10
2013	Fall	ANEQ522 - Animal Metabolism	3	23
2013	Fall	ANEQ522 - Animal Metabolism	3	26
2013	Fall	ANEQ799 - Dissertation	18	7
2013	Fall	ANEQ784 - Supervised College Teaching	18	21
2013	Summer	ANEQ487 - Internship	18	22
2013	Spring	VM757 - Bovine Herd Medicine	3	42
2013	Spring	ANEQ799 - Dissertation	18	5
2013	Spring	ANEQ100 - History of Food Animal Agriculture	3	14
2013	Spring	ANEQ487 - Internship	18	22
2013	Spring	ANEQ487 - Internship	18	29
2013	Spring	ANEQ345 - Principles of Nutrition: Equine Applications	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	ANEQ522 - Animal Metabolism	3	36
2012	Fall	ANEQ792E - Seminar-Nutrition	1	9
2012	Fall	ANEQ784 - Supervised College Teaching	18	21
2012	Fall	ANEQ699 - Thesis	18	5
2012	Summer	ANEQ522 - Animal Metabolism	3	7
2012	Summer	ANEQ487 - Internship	18	22
2012	Spring	VM757 - Bovine Herd Medicine	3	53
2012	Spring	ANEQ799 - Dissertation	18	12
2012	Spring	ANEQ180A1 - Food Animal Agriculture	2	10
2012	Spring	ANEQ487 - Internship	18	33
2012	Spring	ANEQ792E - Seminar-Nutrition	1	7
2012	Spring	ANEQ784 - Supervised College Teaching	18	18
2012	Spring	ANEQ699 - Thesis	18	10
2012	Spring	ANEQ621 - Vitamin and Mineral Metabolism	3	11
2011	Fall	ANEQ522 - Animal Metabolism	3	21
2011	Fall	ANEQ799 - Dissertation	18	8
2011	Fall	ANEQ792E - Seminar-Nutrition	1	10
2011	Fall	ANEQ784 - Supervised College Teaching	18	22
2011	Fall	ANEQ699 - Thesis	18	13
2011	Spring	VM757 - Bovine Herd Medicine	3	47
2011	Spring	ANEQ799 - Dissertation	18	11
2011	Spring	ANEQ180A1 - Food Animal Agriculture	2	13
2011	Spring	ANEQ495 - Independent Study	18	25
2011	Spring	ANEQ500 - Recent Developments	6	9
2011	Spring	ANEQ792E - Seminar-Nutrition	1	12
2011	Spring	ANEQ784 - Supervised College Teaching	18	23
2011	Spring	ANEQ699 - Thesis	18	8
2010	Fall	ANEQ522 - Animal Metabolism	3	25
2010	Fall	ANEQ799 - Dissertation	18	14
2010	Fall	ANEQ280A1 - Introduction to Laboratory Animal Science	3	13
2010	Fall	ANEQ792E - Seminar-Nutrition	1	11
2010	Fall	ANEQ384 - Supervised College Teaching	5	30
2010	Fall	ANEQ784 - Supervised College Teaching	18	27
2010	Fall	ANEQ699 - Thesis	18	14

2010	Summer	ANEQ487 - Internship	18	16
2010	Spring	VM757 - Bovine Herd Medicine	3	54
2010	Spring	ANEQ799 - Dissertation	18	11
2010	Spring	ANEQ495 - Independent Study	18	15
2010	Spring	ANEQ487 - Internship	18	30
2010	Spring	ANEQ500 - Recent Developments	6	8
2010	Spring	ANEQ792E - Seminar-Nutrition	1	15
2010	Spring	ANEQ784 - Supervised College Teaching	18	23
2010	Spring	ANEQ699 - Thesis	18	15
2010	Spring	ANEQ621 - Vitamin and Mineral Metabolism	3	6
2009	Fall	ANEQ522 - Animal Metabolism	3	40
2009	Fall	ANEQ799 - Dissertation	18	10
2009	Fall	ANEQ487 - Internship	18	9
2009	Fall	ANEQ792E - Seminar-Nutrition	1	14
2009	Fall	ANEQ784 - Supervised College Teaching	18	21
2009	Fall	ANEQ699 - Thesis	18	16
2009	Summer	ANEQ487 - Internship	18	17
2009	Summer	ANEQ699 - Thesis	18	2
2009	Spring	VM757 - Bovine Herd Medicine	3	35
2009	Spring	ANEQ799 - Dissertation	18	13
2009	Spring	ANEQ495 - Independent Study	18	17
2009	Spring	ANEQ792E - Seminar-Nutrition	1	12
2009	Spring	ANEQ699 - Thesis	18	14
2008	Fall	ANEQ522 - Animal Metabolism	3	25
2008	Fall	ANEQ799 - Dissertation	18	12
2008	Fall	ANEQ792E - Seminar-Nutrition	1	14
2008	Fall	ANEQ784 - Supervised College Teaching	18	24
2008	Fall	ANEQ699 - Thesis	18	12
2008	Summer	ANEQ487 - Internship	18	22
2008	Spring	VM757 - Bovine Herd Medicine	3	39
2008	Spring	ANEQ487 - Internship	18	24
2008	Spring	ANEQ487 - Internship	18	31
2008	Spring	ANEQ500 - Recent Developments	6	11
2008	Spring	ANEQ792E - Seminar-Nutrition	1	12
2008	Spring	ANEQ621 - Vitamin and Mineral Metabolism	3	12
2007	Fall	ANEQ350C - Animal and Product Judging: Dairy	5	3
2007	Fall	ANEQ522 - Animal Metabolism	3	25
2007	Fall	ANEQ473 - Dairy Systems	3	12
2007	Fall	ANEQ473 - Dairy Systems-Lab	0	12
2007	Fall	ANEQ792E - Seminar: Nutrition	1	9

### Guest Lectures:

<u>Year</u>	<u>Semester</u>	<u>Course No./Title</u>	<u># of Guest Lectures</u>	<u>Delivery Mode</u>
2015	Fall	ANEQ473 - Dairy Systems	1	Face to Face
2015	Fall	SOCR171 - Environmental issues in agriculture	1	Face to Face
2015	Fall	ANEQ725 - Rumen Metabolism	1	Face to Face
2015	Spring	633 - IRM	1	Face to Face
2015	Spring	ANEQ320 - Principles of Animal Nutrition	1	Face to Face
2014	Fall	AGRI 192		Face to Face
2014	Fall	ANEQ 101		Face to Face
2014	Fall	ANEQ 320		Face to Face
2014	Fall	IRM		Face to Face

2014	Fall	One Helth Club	
2014	Fall	SOCR 171 Environmental Issues in Agriculture	Face to Face
2014	Fall	WCIRM Grazin School	Face to Face
2014	Spring	ANEQ 320	
2014	Spring	ANEQ 345	Face to Face

### **Tenure and Promotion Evidence of Teaching Effectiveness (Tenure and Promotion Input)**

#### **Development of New Courses**

2014Fall	ANEQ 345 – Equine Nutrition	3	18	4.92	
2014Fall	ANEQ 522 – Animal Metabolism	3	31	4.89	
2014Spring	ANEQ/PHIL 104 Values, Culture, and Food Animal Agriculture	3	7	4.88	
2014Spring	AN 612 – Vitamin and Mineral Metabolism	3	10		Not Evaluated

#### **Development of New Teaching Techniques**

#### **Conference/Workshop Assessments**

#### **Participation in Professional Development Activities Related to Teaching**

#### **Professional Consultation Related to Teaching**

#### **Other Evidence**

### **EXTENSION/ENGAGEMENT ACTIVITIES/ACCOMPLISHMENTS**

#### **Presentation**

Ram Camp. Adult. Percent Responsible: 1%. 3rd Quarter 2014.

### **COMMITTEES**

CSU Veterinary Admissions Committee, (2014 - Present).

AGEP, (2013 - Present).

Occupational Health Committee, (2011 - Present).

Reiser Scholarship Committee, (2011 - Present).

IACUC, (July 2006 - Present).

University Review Committee for the Department of Microbiology, Immunology, and Pathology Program Review, (June 2015).

University Review Committee for the Program Review of Clinical Sciences, (December 2008 - January 2009).

IACUC, (2003 - 2006).

Animal Population Health Institute internal advisory Board member, (January 2011 - Present).

Colorado Agriculture Experiment Station Project Investigator, (January 2000 - Present).

Courses and Curriculum Committee, (January 2015 - Present).

HOLA, (2014 - Present).

Graduate Coordinator, (January 2009 - Present).

Department Coordinating Committee, (January 2002 - Present).

Search Committee, (October 2015 - December 2015).

Ruminant Production Steering Committee, (2005 - 2014).

Equine Instructor Search Committee, (2012).

College Academic Affairs Committee, (2005 - 2006).

Ag Council Advisor, (2002 - 2004).

Department HEad Search Committee, (2003).

### **PROFESSIONAL AFFILIATIONS AND ACTIVITIES**

American Society of Animal Science. (2011 - Present).

Sigma Xi, The Scientific Research Society. (2011 - Present).

ØAmerican Society for Nutritional Sciences. (2011 - Present).

ØGamma Sigma Delta, The Honor Society of Agriculture. (2011 - Present).

Committee Member, Colorado Livestock Care Coalition. (2013 - Present).

Reviewer, Ad Hoc Reviewer, Manuscript refereeing for the Journal of Animal Science, 1999- present and the Journal of Veterinary Internal Medicine, 2007. (2012 - Present).

Committee Member, National Research Council (NRC) 8th revised edition: Nutrition Requiremetns for Beef Cattle. (2012 - Present).

Member, American Society for Nutritional Sciences. (2011 - Present).

Member, American Society of Animal Science. (2011 - Present).

Member, ASAS – Early Career Awards Committee member, 2011. (2011 - Present).

Member, Gamma Sigma Delta, The Honor Society of Agriculture. (2011 - Present).

Member, Sigma Xi, The Scientific Research Society. (2011 - Present).

Member, USDA AFRI. (2011 - Present).

Reviewer, Ad Hoc Reviewer, BARD. (2010 - Present).

Member, Western Section American Society of Animal Science Awards Committee. (2010 - Present).

Member, Scientific and Advisory Board member for the USDA NIFA funded project “National program for. (2012).

Member, Commissioner of Agriculture Animal Welfare Subcommittee member, 2011 - present. (2011 - 2012).

**OTHER ACTIVITIES/ACCOMPLISHMENTS – SERVICE/OUTREACH**

Academic, American Humane Association, Washington, DC, DC, United States. (January 2014 - Present).

Academic, Citizens Concerned with Conservation for the Upper Arkansas Restoration Project, Leadville, Colorado, United States. (January 2001 - January 2008).

Committee Member, Parks & Recreation City and County of Denver Recycled Water Management Advisory. (2016 - Present).

Committee Member, American Humane Association Scientific Advisory Committee. (2013 - Present).

Committee Member, Colorado Livestock Care Coalition. (2013 - Present).

Committee Member, Farm Forward Scientific Advisory Committee. (2012 - Present).

Animal Technology/Veterinary Technology Advisory Committee member for Front Range Community College. (2005 - Present).

Commissioner of Agriculture Animal Welfare Advisory Subcommittee. (2011 - 2012).

Upper Arkansas Restoration Project: oral presentations on trace mineral metabolism in beef cattle. (2000 - 2010).

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