

CURRICULUM VITAE

Dale R. Woerner, Ph.D.
Associate Professor
Cargill Endowed Professor in Sustainable Meat Science
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EDUCATION

- Ph.D., Meat Science, Colorado State University. Department of Animal Sciences, Fort Collins, CO. August 2009.
- M.S., Meat Science, Texas Tech University. Department of Animal and Food Sciences, Lubbock, TX. August 2005.
- B.S., Animal Science, Texas Tech University. Department of Animal and Food Sciences, Lubbock, TX. May 2003.

PROFESSIONAL EXPERIENCE

- Associate Professor, Cargill Endowed Chair in Sustainable Meat Science, Texas Tech University, Department of Animal and Food Sciences, September 2018 - present
- Associate Professor, Department of Animal Sciences, Colorado State University, July 2015 – August 2018
- Assistant Professor, Department of Animal Sciences, Colorado State University, 2009 – July 2015.
- Member, Colorado State University PRSE, Center for Meat Safety & Quality, 2009 - Present
- Member, Colorado State University Microbial Ecology Group – 2015 - Present
- Meat Science Outreach Coordinator, Department of Animal Sciences, Colorado State University, 2008 - 2009. In the absence of a meat extension specialist, coordinated outreach and extension-like activities for the meat science section, Center for Meat Safety and Quality, and for the Department of Animal Sciences. This included serving as the contact person for state and regional meat processing organizations, serving meat processors in the state of Colorado, and coordinating all extension and youth activities associated with Meat Science in the state of Colorado.
- Graduate Research Assistant, Department of Animal Sciences, Colorado State University, 2005 – 2009. Conducted research and teaching duties as a Ph.D. student in meat science group and department.
- Meat Judging Team Coach, Department of Animal Sciences, Colorado State University, 2006 – 2008. Recruited and trained meat judging team members and served as the primary instructor for 2 courses offered in the Department of Animal Science. Led teams in the competitive years of 2007 and 2008. This duty involved the development and coordination of fundraising efforts.
- Graduate Research Assistant, Department of Animal Sciences, Texas Tech University, 2003 – 2005. Conducted research and teaching duties as a M.S. student in meat science group and department.

- Meat Judging Team Coach, Department of Animal Sciences, Texas Tech University, 2003 – 2004. Recruited and trained meat judging team members and served as the primary instructor for 2 courses offered in the Department of Animal Science. Led teams in the competitive year of 2004.
- Meat Judging Team Coach, Department of Animal Sciences, Texas Tech University, 2003 – 2004. Recruited and trained meat judging team members and served as the primary instructor for 2 courses offered in the Department of Animal Science. Led a team in the competitive year of 2004.
- Meat Judging Team Coach, Agriculture Department, Clarendon College, 2002 – 2003. Recruited and trained meat judging team members. Led teams in the competitive year of 2003.
- Operations Management Intern, Cargill Meat Solutions (Excel), Plainview, TX, Summer 2002. Management trainee in production. Rib line and thin meat line supervisor.
- Undergraduate Research Assistant, Meat Science Section, Department of Animal Science, Texas Tech University, 2000-2003. Research lab and Meat Laboratory employee.

MEMBERSHIP IN PROFESSIONAL AND HONORARY SOCIETIES

Memberships in professional societies

- American Hereford Association Member; 1996 - Current
- American Society of Animal Scientists Member; 2001 - Current
- American Meat Science Association Member; 2001 – Current
- Intercollegiate Meat Coaches Association; 2003 – Current
- American Meat Science Association Student Activities Committee Member; 2004 - Current
- National Cattlemen’s Beef Association member; 2005 - Current
- Colorado Livestock Association Member; 2005 – Current
- Colorado Cattlemen’s Association Member; 2005 – Current
- USDA-AMS Beef Tenderness Task Force Member; 2008 - Current
- American Meat Science Association National 4H Advisory Board; 2008 - Current
- Colorado Association of Meat Processors Technical Advisor; 2009 - Current
- International Association for Food Protection Member; 2009 - Current
- Beef Innovations Group, National Cattlemen’s Beef Association; 2012 – Current
- Fats and Proteins Research Foundation – Research Committee Member, 2015 – Current
- American Meat Science Association Board of Directors – Member – 2016 – 2019
- American Meat Science Association Lexicon Committee – Member – 2016 – Current
- Industry-Wide Cooperative Meat Identification Standards Committee (ICMISC) – Member 2016 - Current
- North American Meat Institute (NAMI) Meat Buyer’s Guide Editing Committees – Beef Section & Lamb Section – 2019 – Current
- USDA Technical Advisory Committee for ISO Technical Committee 34/Subcommittee 6 Meat, Poultry, Fish and Eggs – Member 2019- Current
- Texas Education Agency (TEA) K-12 Science TEKS Content Advisor Committee Member – 2019 – Current
- National Cattlemen’s Beef Association (NCBA), Beef Quality Assurance (BQA) Advisory Committee – 2020 - Present

Office in professional societies

- American Meat Science Association Student Membership; West Region Director – 2006 – 2009
- American Meat Science Association Student Membership; President 2008-2009
- American Meat Science Association Student Membership; Past President -2009
- Intercollegiate Meat Coaches Association; Past President – 2012
- Intercollegiate Meat Coaches Association; President – 2011
- Intercollegiate Meat Coaches Association; President Elect – 2010
- American Meat Science Association National 4H Advisory Board; Chairperson 2010 – 2017
- Reciprocal Meat Conference (RMC) Chairman – 2018

HONORS AND AWARDS

- North American Meat Institute (NAMI) Harry L. Rudnick Educator’s Award, 2018
- American Society of Animal Science Early Career Achievement Award, 2018
- Colorado State University, Department of Animal Sciences – Golden Boot Outstanding Teacher Award, 2018
- Texas Tech University Distinguished Alumni Award of the College of Agricultural Sciences and Natural Resources, 2018
- American Meat Science Association RMC Chairman, 2018
- American Meat Science Association Achievement Award, 2015
- Colorado Association of Meat Processors Sharp Cleaver Award, 2015
- Cattle Business Weekly’s Top 10 Industry Leaders Award, “Difference Maker”, 2014.
- Texas Tech University Department of Animal and Food Science’s Horizon Award and Hall of Fame Inductee, 2014
- Colorado State The Magazine: Feeding the World – Faculty Working to Address the Global Hunger Crisis, 2014
- Vance Publishing 40 Under 40 in Agriculture Award, “Contributing to the 2050 Food Challenge”, 2013.
- Texas Tech University’s Department of Animal and Food Sciences’ Passing the Torch Recognition: An Odyssey of Champions. 2010.
- Colorado FFA Association’s Honorary Colorado State FFA Degree, 2009.
- Colorado State University, Department of Animal Science Spur of Excellence Outstanding Graduate Student Award, 2008-2009
- National Cattlemen’s Foundation W.D. Farr Fellowship Recipient, 2007
- American Meat Science Association Intercollegiate Meat Judging Program, National Champion Team Coach, 2007.
- American Meat Science Association Intercollegiate Meat Judging Program, High Plains Contest Champion Team Coach, 2007.
- American Meat Science Association 4-H Meat Judging Program, National Champion Team Coach, 2007.
- Texas Tech University Meat Science Program’s Meathead of the Year, 2005
- American Meat Science Association Meat Science Quiz Bowl, National Champion Team Coach, 2005.

- San Antonio Livestock Exposition's Meat Science Graduate Student Fellowship Award – Texas Tech University, 2004.
- American Meat Science Association Intercollegiate Meat Judging Program, Reserve National Champion Team Coach, 2004.
- American Meat Science Association Intercollegiate Meat Judging Program, Southwestern Contest Champion Team Coach, 2004.
- American Meat Science Association Intercollegiate Meat Judging Program, Eastern National Contest Champion Team Coach, 2004.
- American Meat Science Association Intercollegiate Meat Judging Program, American Royal Contest Champion Team Coach, 2004.
- American Meat Science Association Intercollegiate Meat Judging Program, High Plains Contest Champion Team Coach, 2004.
- American Meat Science Association 4-H Meat Judging Program, National Champion Team Coach, 2004.
- Houston Livestock Show and Rodeo Department of Animal and Food Sciences Graduate Fellowship Award, Texas Tech University, 2003.
- American Meat Science Association Intercollegiate Meat Judging Team A-Division, National Champion Team Coach, 2003.
- American Meat Science Association Intercollegiate Meat Judging Team A-Division, National Western Champion Team Coach, 2003.
- American Meat Science Association Intercollegiate Meat Judging Team A-Division, Southwestern Western Champion Team Coach, 2003.
- American Meat Science Association Intercollegiate Meat Judging Team A-Division, Houston Livestock Show and Rodeo Champion Team Coach, 2003.
- American Meat Science Association Intercollegiate Meat Judging Team A-Division, American Royal Champion Team Coach, 2003.
- American Meat Science Association Meat Science Quiz Bowl, National Champion Team Member, 2003.
- Texas Tech University College of Agricultural Sciences and Natural Resources Outstanding Undergraduate Student Award, 2003.
- Texas Tech University Department of Animal and Food Sciences Outstanding Undergraduate Student Award, 2003.
- Texas Tech University Department of Animal and Food Sciences Highest Academic Achievement Award, 2003.
- National Meat Association (NMA) Undergraduate Scholarship Recipient, 2002.
- American Meat Science Association National Scholastic Undergraduate Achievement Award, 2002
- Markus F. Miller Spirit and Motivation Award, Texas Tech University, 2001.
- American Meat Science Association Intercollegiate Meat Judging Program, Reserve National Champion Team Member, 2001.
- Houston Livestock Show & Rodeo Scholar, 1999-2003
- College of Agricultural Sciences and Natural Resources Scholar, 1999-2003
- Gordon W. Davis Excellence in Meat Science Endowment Scholar, 1999-2003
- Hill Country District Livestock Show Association Scholar, 1999-2003
- Texas Sheep and Goat Raisers Association Scholar, 1999-2000

- Gillespie County Youth Livestock Show Scholar, 1999-2000
- Albert Usener Memorial Scholarship Fund Scholar, 1999-2000
- Brett Barwise Memorial Scholarship Fund Scholar, 1999-2000
- Christian Behrends Memorial Scholarship Fund Scholar, 1999-2000

AREA OF EXPERTISE:

RESEARCH AND TEACHING INTERESTS

- Meat quality; sensory properties of meat; meat processing; meat cookery; meat flavor chemistry; nutritional value of meat; red meat composition; innovative carcass cutting strategies; red meat yield; international marketing of red meat; meat shelf life; livestock quality management systems; sustainability.

PUBLICATIONS:

Book Chapters: Total of – 3

(*Denotes Woerner as a committee member for grad student author.):

1. *T. W. Hoffman, **D. R. Woerner**, J. D. Tatum, R. J. Delmore, H. Yang, R. K. Peel, S. B. LeValley, and K. E. Belk. 2014. Lamb Quality Chapter, SID Sheep Production Handbook 8th Ed. Submitted to the American Sheep Industry Association. September 2014. Englewood, CO.
2. **Woerner, D. R.**, J. A. Scanga, and K. E. Belk. 2012. Chapter 157. Slaughter-line operation | Cattle. Encyclopedia of Meat Science 2nd Edition. Elsevier. Pp. 1237 – 1242.
3. **Woerner, D. R.** and M. F. Miller. 2004. Beef: carcass composition and quality. Encyclopedia of Animal Science. pp. 58 – 60

Refereed Journal Articles: total published – 75

(***Denotes Woerner as project PI; **Denotes Woerner as advisor to graduate student author; *Denotes Woerner as a committee member for grad student author.):

1. **Chaoyu Zhai, Blanchefort A. Djimsaa, Jessica E. Prenni, **Dale R. Woerner**, Keith E. Belk, and Mahesh N. Nair. Tandem mass tag labeling to characterize muscle-specific proteome changes in beef during early postmortem period. J of Proteomics 222 (2020) 103794. <https://doi.org/10.1016/j.jprot.2020.103794>
2. **Lauren E O'Connor, Cody L Gifford, **Dale R Woerner**, Julia L Sharp, Keith E Belk, Wayne W Campbell. 2019. Dietary Meat Categories and Descriptions in Chronic Disease Research Are Substantively Different within and between Experimental and Observational Studies: A Systematic Review and Landscape Analysis. Advances in Nutrition, nmz072, <https://doi.org/10.1093/advances/nmz072>.
3. Pablo Rovira, Tim McAllister, Steven Michael Lakin, Shaun R. Cook, Enrique Doster, Noelle R. Noyes, Maggie D. Weinroth, Xiang Yang, Jennifer K. Parker, Christina Boucher, Calvin W. Booker, **Dale R Woerner**, Keith E Belk, Paul S Morley. Characterization of the

- Microbial Resistome in Conventional and “Raised Without Antibiotics” Beef and Dairy Production Systems. *Front. Microbiol.*, 04 September 2019
| <https://doi.org/10.3389/fmicb.2019.01980>
4. *** Gredell, Devin A., Amelia R Schroeder, Keith E. Belk, Corey D. Broeckling, Adam L. Heubeger, Soo-Young Kim, D. Andy King, Steven D. Shackelford, Julia L. Sharp, Tommy L. Wheeler, **Dale R. Woerner**, and Jessica E. Prenni. 2019. Comparison of Machine Learning Algorithms for Predictive Modeling of Beef Attributes Using Rapid Evaporative Ionization Mass Spectrometry (REIMS) Data. *Scientific Reports* volume 9, Article number: 5721. <https://doi.org/10.1038/s41598-019-40927-6>.
 5. Huebner, Katherine L. Jennifer N. Martin, Carla J. Weissend, Katlyn L. Jennifer K. Parker, Steven M. Lakin, Enrique Doster, Margaret D. Weinroth, Zaid Abdo, **Dale R. Woerner**, Jessica L. Metcalf, Ifigenia Geornaras, Tony C. Bryant, Paul S. Morley, and Keith E. Belk. 2019. Effects of a *Saccharomyces cerevisiae* fermentation product on liver abscesses, fecal microbiome, and resistome in feedlot cattle raised without antibiotics. December 2019. *Scientific Reports* 9(1). DOI: 10.1038/s41598-019-39181-7
 6. ***Perham, C. C., Gifford, C. L., **Woerner, D.**, Engle, T. E., Sellins, K. S., Acheson, R. J., Douglass, L. W., Tatum, J. D., Delmore, R. J., Cifelli, A., McNeill, S. H., Belk, K. E. (2019). Special-Fed Veal: Separable components, proximate composition, and nutrient analysis of selected raw and cooked, wholesale and retail cuts.. *Meat science*, 148, 19-31.
 7. ***Acheson, Rebecca J., **Woerner, Dale R.**, Walenciak, Clinton E., Colle, Michael J., Bass, Phillip D. 2018. Distribution of Marbling Throughout the of Beef Carcasses Using an Instrument-Grading System. *Meat and Muscle Biology* 2(1):303–308 (2018).
doi:10.22175/mmb2018.04.0005
 8. ***Gredell, Devin A., **Dale R. Woerner**, Jerrad F. Legako, Nivaldo de Faria Sant’Ana, Lucas Arantes-Pereira, J. Chance Brooks, J. Daryl Tatum, Robert J. Delmore, and Keith. E. Belk. 2018. Understanding the impact of oven temperature and relative humidity on the beef cooking process. *Meat and Muscle Biology* 2(1):334–343 (2018).
doi:10.22175/mmb2018.04.0008
 9. *Kiel, R.C., J.N. Martin, **D.R. Woerner**, R. Murphy, I. Geornaras, J.R. Levey, H. Yang, R.J. Delmore, and K.E. Belk. 2018. Influence of storage temperature, moisture content, and physical impurities on the distribution and survival of *Salmonella enterica* in poultry fat intended for pet food use. *Journal of Food Protection*. 81 (8): 1364-1372.
 10. ***Perham, C.C., C.L. Gifford, **D.R. Woerner**, T.E. Engle, K.S. Sellins, R.J. Acheson, L.W. Douglass, J.D. Tatum, R.J. Delmore, A. Cifelli, S.H. McNeill, and K.E. Belk. 2018. Special-Fed Veal: Separable components, proximate composition, and nutrient analysis of selected raw and cooked, wholesale and retail cuts. *Meat Science*. doi:10.1016/j.meatsci.2018.09.016
 11. ***Gredell, Devin A., Jordan H. McHenry, **Dale R. Woerner**, Jerrad F. Legako, Terry E. Engle, J. Chance Brooks, J. Daryl Tatum, and Keith E. Belk. 2018 Palatability characterization of fresh and dry-aged ground beef patties. *Meat and Muscle Biology* 2(1):265–276. doi:10.22175/mmb2018.04.0007
 12. Weinroth MD, Scott HM, Norby B, Loneragan GH, Noyes NR, Rovira P, Doster E, Yang X, **Woerner DR**, Morley PS, Belk KE. 2018. Effects of ceftiofur and chlortetracycline on the resistomes of feedlot cattle. *Appl Environ Microbiol* 84:e00610-18.
<https://doi.org/10.1128/AEM.00610-18>.
 13. Seman, D. D. Boler, C. Carr, M. Dikeman, C. Owens, J. Keeton, D. Pringle, J. Sindelar, **D. Woerner**, A. De Mello, T. Powell. 2018. Meat Science Lexicon. *Meat Science and Muscle Biology*. *Meat and Muscle Biology* 2(3):1–15 (2018) doi:10.22175/mmb2017.12.0059.

14. Harris, M. K., L. C. Eastwood, C. A. Boykin, A. N. Arnold, K. B. Gehring, D. S. Hale, C. R. Kerth, D. B. Griffin, J. W. Savell, K. E. Belk, **D. R. Woerner**, J. D. Hasty, R. J. Delmore, Jr., J. N. Martin, T. E. Lawrence, T. J. McEvers, D. L. VanOverbeke, G. G. Mafi, M. M. Pfeiffer, T. B. Schmidt, R. J. Maddock, D. D. Johnson, C. C. Carr, J. M. Scheffler, T. D. Pringle, and A. M. Stelzleni. 2018. National Beef Quality Audit – 2016: assessment of cattle hide characteristics, offal condemnations, and carcass traits to determine the quality status of the market cow and bull beef industry. *Transl. Anim. Sci.* 2:37-49. doi:10.1093/tas/txx002
15. *****Woerner, Dale R.**, Ifigenia Geornaras, Jennifer N. Martin, Keith E. Belk, Gary R. Acuff and James S. Dickson. 2018. Use of Non-Pathogenic *Escherichia coli* Surrogates as Predictors of the Survival of Non-Typhoidal *Salmonella*, non-O157 Shiga Toxin-Producing *E. coli* and *E. coli* O157 Populations after High Hydrostatic Pressure Processing. *Journal of Food Protection* JFP-17-385.
16. Roseland, J. M., Q. V. Nguyen, L. W. Douglass, K. Y. Patterson, J. C. Howe, J. R. Williams, L. D. Thompson, J. C. Brooks, **D. R. Woerner**, T. E. Engle, J. W. Savell, K. B. Gehring, A. M. Cifelli, S. H. McNeill. 2017. Fatty acid, cholesterol, vitamin, and mineral content of cooked beef cuts from a national study. *J. Food Comp. and Anal.* <https://doi.org/10.1016/j.jfca.2017.12.003>
17. *Yang, X., B. R. Bullard, I. Geornaras, S. Hu, **D. R. Woerner**, R. J. Delmore, J. B. Morgan, and K. E. Belk. 2017. Comparison of the efficacy of a sulfuric acid-sodium sulfate blend and lactic acid for the reduction of *Salmonella* on pre-rigor beef carcass surface tissue. *J. Food Prot.* Apr 3:809-813. doi: 10.4315/0362-028X.JFP-16-317.
18. D. D. Boler and **D. R. Woerner**. 2017. What is meat? A perspective from the American Meat Science Association. *Animal Frontiers*. doi:10.2527/af.2017.0436.
19. **Hasty, J. D., M. M. Pfeifer, L. C. Eastwood, D. A. Gredell, C. L. Gifford, J. R. Levey, C. M. Cashman, **D. R. Woerner**, J. N. Martin, R. J. Delmore, W. B. Griffin, D. L. VanOverbeke, G. G. Mafi, C. A. Boykin, D. S. Hale, C. R. Kerth, D. B. Griffin, A. N. Arnold, J. W. Savell, D. L. Pendell, and K. E. Belk. 2017. National Beef Quality Audit-2016: Phase 1, Face-to-face interviews. *Transl. Anim. Sci.* 2017.1. doi:10.2527/tas2017.0039.
20. McNeill, S. H., A. M. Cifelli, J. M. Roseland, K. E. Belk, **D. R. Woerner**, K. B. Gehring, J. W. Savell, J. C. Brooks, L. D. Thompson. 2017. A research communication brief: Gluten analysis in beef samples collected using a rigorous, nationally representative sampling protocol confirms that grain-finished beef is naturally gluten-free. *Nutrients*. 9:936-940, doi:10.3390/nu9090936.
21. **Gifford, C., L. O'Connor, W. Campbell, **D. Woerner**, and K. Belk. 2017. Broad and inconsistent muscle food classification is problematic for dietary guidance in the U.S. *Nutrients*, 9:1027; doi:10.3390/nu9091027.
22. Scott-Bullard, B. R., I. Geornaras, R. J. Delmore, **D. R. Woerner**, J. O. Reagan, J. B. Morgan, and K. E. Belk. 2017. Efficacy of a Blend of Sulfuric Acid and Sodium Sulfate against Shiga Toxin-Producing *Escherichia coli*, *Salmonella*, and Nonpathogenic *Escherichia coli* Biotype I on Inoculated Prerigor Beef Surface Tissue. *Journal of Food Protection*, Vol. 80, No. 12, 2017, Pages 1987–1992. doi:10.4315/0362-028X.JFP-17-022.
23. Harris, M. K., L. C. Eastwood, C. A. Boykin, A. N. Arnold, K. B. Gehring, D. S. Hale, C. R. Kerth, D. B. Griffin, J. W. Savell, K. E. Belk, **D. R. Woerner**, J. D. Hasty, R. J. Delmore, Jr., J. N. Martin, T. E. Lawrence, T. J. McEvers, D. L. VanOverbeke, G. G. Mafi, M. M. Pfeiffer, T. B. Schmidt, R. J. Maddock, D. D. Johnson, C. C. Carr, J. M. Scheffler, T. D. Pringle, and

- A. M. Stelzleni. 2017. National Beef Quality Audit – 2016: Transportation, mobility, live cattle, and carcass assessments of targeted producer-related characteristics that affect value of market cows and bulls, their carcasses, and associated by-products. *Transl. Anim. Sci.* doi:10.2527/tas2017.0063
24. Eastwood, L.C., C.A. Boykin, M.K. Harris, A.N. Arnold, D.S. Hale, C.R. Kerth, D.B. Griffin, J.W. Savell, K.E. Belk, **D.R. Woerner**, J.D. Hasty, R.J. Delmore Jr., J.N. Martin, T.E. Lawrence, T.J. McEvers, D.L. VanOverbeke, G.G. Mafi, M.M. Pfeiffer, T.B. Schmidt, R.J. Maddock, D.D. Johnson, C.C. Carr, J.M. Scheffler, T.D. Pringle and A.M. Stelzleni. 2017. National Beef Quality Audit-2016: Transportation, mobility, and harvest-floor assessments of targeted characteristics that affect quality and value of cattle, carcasses, and by-products. doi:10.2527/tas2017.0029. *Translational Anim. Sci.* 1:229-238.
 25. Boykin, C. A., L. C. Eastwood, M. K. Harris, D. S. Hale, C. R. Kerth, D. B. Griffin, A. N. Arnold, J. D. Hasty, K. E. Belk, **D. R. Woerner**, R. J. Delmore Jr., J. N. Martin, D. L. VanOverbeke, G. G. Mafi, M. M. Pfeiffer, T. E. Lawrence, T. J. McEvers, T. B. Schmidt, R. J. Maddock, D. D. Johnson, C. C. Carr, J. M. Scheffler, T. D. Pringle, A. M. Stelzleni, J. Gottlieb and J. W. Savell. 2017. National Beef Quality Audit–2016: In-plant survey of carcass characteristics related to quality, quantity, and value of fed steers and heifers. doi:10.2527/jas.2017.1543. *J. Anim. Sci.* 95:2993-3002.
 26. Boykin, C.A., L.C. Eastwood, M.K. Harris, D.S. Hale, C.R. Kerth, D.B. Griffin, A.N. Arnold, J.D. Hasty, K.E. Belk, **D.R. Woerner**, R.J. Delmore, Jr., J.N. Martin, D.L. VanOverbeke, G.G. Mafi, M.M. Pfeiffer, T.E. Lawrence, T.J. McEvers, T.B. Schmidt, R.J. Maddock, D.D. Johnson, C.C. Carr, J.M. Scheffler, T.D. Pringle, A.M. Stelzleni, J. Gottlieb, and J.W. Savell. 2017. National Beef Quality Audit-2016: Survey of carcass characteristics through instrument grading assessments. *J. Anim. Sci.* doi:10.2527/jas2017.1544
 27. Noyes, N. R., X. Yang, L. M. Linke, R. J. Magnuson, A. Dettenwanger, S. Cook, I. Geornaras, **D. R. Woerner**, S. P. Gow, T. A. McAllister, H. Yang, J. Ruiz, K. L. Jones, C. A. Boucher, P. S. Morley, and K. E. Belk. 2016. Resistome diversity in cattle and the environment decreases during beef production. *eLife* 2016;5:e13195.
 28. Noyes N, Linke L, Magnuson R, Belk K, Yang X, Yang H, **Woerner D**, Geornaras I, Morley P, Cook S, Zaheer R, McAllister T, McArt J, Gow S, Ruiz J, Boucher C, and Jones K. 2016. Characterization of the resistome in manure, soil and wastewater from dairy and beef production systems. *Scientific Reports*, vol. 6 (2016).
 29. Yang H, Geornaras I, **Woerner D**, Sofos J, Belk K, and Carlson B. 2016. Draft genome sequence of Shiga toxin-negative *Escherichia coli* O157: H7 strain C1-057, isolated from feedlot cattle *Genome Announcements*, vol. 4, issue 2 (2016).
 30. *Yang X., N. R. Noyes, E. Doster, J. N. Martin, L. M. Linke, R. J. Magnuson, H. Yang, I. Geornaras, **D. R. Woerner**, K. L. Jones, C. Boucher, P. S. Morley, and K. E. Belk. 2016. Use of metagenomic shotgun sequencing technology to detect foodborne pathogens within microbiome in beef production. *Appl Environ Microbiol* 82:2433–2443. doi:10.1128/AEM.00078-16.
 31. *Yang H., B. Carlson, I. Geornaras, **D. Woerner**, J. Sofos, and K. Belk. 2016. Draft Genome Sequence of a Shiga Toxin-Negative *Escherichia coli* O157:H7 Strain C1-057 Isolated from Feedlot Cattle. *ASM Genome Announc* 4(2):e00049-16. doi:10.1128/genomeA.00049-16.
 32. *Luzardo, S., **D. R. Woerner**, I. Geornaras, T. E. Engle, R. J. Delmore, A. M. Hess, and K. E. Belk. 2016. Effect of packaging during storage time on retail display shelf-life of strip

- loins from two different beef production systems. *J. Anim. Sci.* 94:2624-2636.
33. *Luzardo, S., **D. R. Woerner**, I. Geornaras, T. E. Engle, R. J. Delmore, A. M. Hess, and K. E. Belk. 2016. Effect of packaging during storage time on retail display microbial populations of beef strip loins from two different production systems. *J. Anim. Sci.* 94:2614-23. doi: 10.2527/jas.2016-0290
 34. **Semler, M. L., **D. R. Woerner**, K. E. Belk, K. J. Enns, and J. D. Tatum. 2016. Effects of USDA carcass maturity on sensory attributes of steaks produced by cattle representing two dental age classes. *J. Anim. Sci.* 94(5):2207-17. doi: 10.2527/jas.2016-0382.
 35. ***Yang, X., **D. R. Woerner**, K. R. McCullough, J. D. Hasty, I. Geornaras, G. C. Smith, J. N. Sofos, and K. E. Belk. 2016. An evaluation of the effectiveness of FreshCase technology to extend the storage life of whole-muscle pork and ground pork sausage. *J. Anim. Sci.* 94:4921–4929 (doi:10.2527/jas2016-0509).
 36. ***Yang, X., **D. R. Woerner**, J. D. Hasty, K. R. McCullough, I. Geornaras, J. N. Sofos, and K. E. Belk. 2016. An evaluation of the effectiveness of FreshCase technology to extend the storage life of whole muscle beef and ground beef. *J. Anim. Sci.* 94:4911–4920 (doi:10.2527/jas2016-0508).
 37. Wagner J, Engle T, Caldera E, Neuhold K, **Woerner D**, Spears J, Heldt J, and Laudert S. 2016. The effects of zinc hydroxychloride and basic copper chloride on growth performance, carcass characteristics, and liver zinc and copper status at slaughter in yearling feedlot steers. *Professional Animal Scientist* (2016) 32(5).
 38. Noyes, N. R., X. Yang, L. M. Linke, R. J. Magnuson, A. Dettenwanger, S. Cook, I. Geornaras, **D. R. Woerner**, S. P. Gow, T. A. McAllister, H. Yang, J. Ruiz, K. L. Jones, C. A. Boucher, P. S. Morley. K. E. Belk. 2016. Resistome diversity in cattle and the environment decreases during beef production. *eLife*, 5:e13195.
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http://www.beefresearch.org/CMDocs/BeefResearch/PE_Executive_Summaries/Addendum_Industry_Guide_final.pdf
 89. *Murphy, R. G. L., M. B. Bowling, D. L. Pendell, **D. R. Woerner**, J. D. Tatum, and K. E. Belk. 2010. What is quality? The propensity of foreign customers of U.S. pork to pay for pork quality attributes in select export markets. pp. 1-198. Final report to National Pork

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 92. *Green, M. D., R. G. L. Murphy, T. L. Desimone, C. I. Pittman, M. B. Bowling, C. L. Dixon, F. A. Carvalho, L. Goodridge, K. K. Nightingale, J. N. Sofos, J. D. Tatum, **D. R. Woerner**, G. C. Smith, and K. E. Belk. 2010. A review of procedures to extend the storage life of chilled and frozen beef, pork, and lamb muscle cuts, variety meats, and processed products destined for foreign markets, and a presentation of storage life estimates. pp. 1-166. Final report to United States Meat Export Federation, Denver, CO, by the Center for Meat Safety and Quality, Department of Animal Sciences, Colorado State University, Fort Collins, CO.
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 95. **Woerner, D. R.** 2010. The Facts: Beef from market cows. National Cattlemen’s Beef Association, Centennial, CO. Available at www.beefresearch.org.
 96. Carpenter, T. D., K. E. Belk, **D. R. Woerner**, J. D. Tatum, and G. C. Smith. 2010. Fact Sheet: Beef Cutout Calculator II. National Cattlemen’s Beef Association, Centennial, CO. Available at www.beefresearch.org.
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 98. **Woerner, D. R.**, P. D. Bass, T. E. Engle, J. D. Tatum, G. C. Smith, and K. E. Belk. 2009. Use Of Video Imaging Technology To Predict Cutability And Sensory Quality Of Beef Products Generated From Mature Cow/Bull Carcasses. pp. 1-33. Final Report to the National Cattlemen’s Beef Association. Department of Animal Sciences, Colorado State University, Fort Collins, CO.
 99. *F. A. C. Neto, **D. R. Woerner**, J. D. Tatum, G. C. Smith, and K. E. Belk. 2009. Development of USDA Performance Standards for Officially Approving VIA Lamb Carcass Evaluation Instrumentation and Comprehensive consumer panel sensory attributes ranking

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 102. **Woerner, D. R.** and K. E. Belk. 2008. The History of Instrument Assessment of Beef – A Focus on the Last 10 Years. Submitted to the National Cattlemen’s Beef Association, Centennial, CO. Available at www.beefresearch.org.
 103. **Woerner, D. R.**, R. G. L. Murphy, K. Katoh, J. A. Scanga, J. D. Tatum, G. C. Smith, and K. E. Belk. 2007. Standard Industry Guide for Beef Yield and Cutout. pp. 1-3. Final report to: National Cattlemen’s Beef Association, 9110 East Nichols Avenue, Centennial, Colorado 80112-3450. Center for Meat Safety and Quality, Department of Animal Sciences, Colorado State University, Fort Collins, CO.
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Other Publications: Total of - 8

1. **Woerner, D. R.**, M. R. Emerson, J. D. Tatum, and K. E. Belk. 2011. Computer Animation: Beef Muscle Contraction and Relaxation. Length: 4:21. Available online at: <http://beefresearch.org/animation/index.html#/contraction-relaxation>. Accessed 10/13/14
2. **Woerner, D. R.**, M. R. Emerson, J. D. Tatum, and K. E. Belk. 2011. Computer Animation: Beef Muscle Rigor Mortis. Length: 2:08. Available online at: <http://beefresearch.org/animation/index.html#/contraction-relaxation>. Accessed 10/13/14
3. **Woerner, D. R.**, M. R. Emerson, J. D. Tatum, and K. E. Belk. 2011. Computer Animation: Beef Muscle Proteolysis. Length: 1:59. Available online at: <http://beefresearch.org/animation/index.html#/contraction-relaxation>. Accessed 10/13/14
4. **Woerner, D. R.**, M. R. Emerson, J. D. Tatum, and K. E. Belk. 2011. Computer Animation: Beef Muscle Contraction and Relaxation. Length: 4:21. Available online at: <http://beefresearch.org/animation/index.html#/contraction-relaxation>. Accessed 10/13/14
5. **Woerner, D. R.**, M. R. Emerson, J. D. Tatum, and K. E. Belk. 2011. Computer Animation: Beef Muscle Myoglobin and Oxidation. Length: 2:05. Available online at: <http://beefresearch.org/animation/index.html#/contraction-relaxation>. Accessed 10/13/14
6. **Woerner, D. R.**, M. R. Emerson, J. D. Tatum, and K. E. Belk. 2011. Computer Animation: Beef Muscle Contraction and Relaxation. Length: 4:21. Available online at: <http://beefresearch.org/animation/index.html#/contraction-relaxation>. Accessed 10/13/14
7. **Woerner, D. R.**, X. Yang, J. D. Tatum, and K. E. Belk. 2012. Computer Animation: Beef Storage Life. Length: 6:20. Available online at: <http://beefresearch.org/animation/index.html#/contraction-relaxation>. Accessed 10/13/14

8. **Woerner, D. R.,** J. H. McHenry, J. D. Tatum, and K. E. Belk. 2012. Educational Video: An Overview of U.S. Beef Grading Systems. Length 22:44. Available online at: <http://youtu.be/tEHwm1gj-w>. Accessed 10/13/14.

PRESENTATIONS AND LECTURES: Total of – 241

Mo/Yr	Program Title or Purpose	Nature of Participation
8/2009	USMEF Russian Media Team, CSU ARDEC, Fort Collins, CO	Host/Speaker
8/2009	JBS Japanese Food Safety Presentation, Greeley, CO	Host/Speaker
8/2009	USMEF Egyptian Veterinarian Team Visit, Fort Collins, CO	Host/Speaker
9/2009	CO Nutrition Round Table, Fort Collins, CO	Participant
9/2009	Alchemy SISTEM Installation (David Tripplett), Campus	Host
9/2009	NWSS Hide Party, Denver, CO	Demonstration Leader
9/2009	Larimer County 4H Achievement Night, Loveland, CO	Speaker
9/2009	Pfizer Animal Health Regional Meeting, Wellington, CO	Speaker
9/2009	JBS USA Food Safety Research Update Meeting, Greeley, CO	Invited Speaker
10/2009	Guest Lecture: ANEQ 478 Beef Systems Capstone Course: Overview of Beef Industry, Industry Challenges, Beef Demand, and Beef Palatability.	Guest Lecturer
10/2009	4H and FFA Meat Judging Workshop, Fort Collins, CO	Host/Instructor
10/2009	Colorado Premium Foods Meeting with Business School, Campus	Host/Organizer
10/2009	NCBA Research Meeting, Denver, CO	Participant
10/2009	National 4H Meat Judging Contest, Manhattan, KS	State Representative
11/2009	USMEF Board of Directors Meeting, Denver, CO	Participant
11/2009	AMSA Official High Plains Meat Judging Contest	Official
11/2009	Guest Lecture: ANEQ 286 Lab Practicum; Introduction to meat product evaluation and meat judging.	Guest Lecturer
12/2009	Larimer Co. Stock Growers' Meeting, Wellington, CO	Speaker
12/2009	USMEF Japanese Media Team Visit, Fort Collins, CO	Host/Speaker
12/2009	CO Corn Producers Regional Meeting, Boulder, CO	Speaker
12/2009	MLA Meeting with Allan Bloxsom & Rod Polkinghorne, Campus	Host
1/2010	Western National Roundup, National 4H and FFA Meat Judging Contest	Coordinator/Host/Superintendent/Official
1/2010	Beef industry and grading overview with packing plant tour. International Livestock Congress	Invited Speaker
1/2012	National Western Stock Show Fed Beef and Youth Carcass Contest	Superintendent
2/2010	Principles of meat judging. 4H and FFA Meat Judging Workshop	Outreach/Host

Mo/Yr	Program Title or Purpose	Nature of Participation
3/2010	Overview of the U.S. Beef Industry. Presented to trade team from Korea E-mart at the request of the U.S. Meat Export Federation	Invited Speaker
3/2010	Guest Lecture: ANEQ 286 Lab Practicum; Introduction to meat product evaluation and meat judging.	Guest Lecturer
4/2010	US beef industry overview and packing plant tour. American Bovine Practitioners.	Host/Invited Speaker
5/2010	Overview of the U.S. Beef Industry. Presented to delegation of Taiwanese media at the request of the U.S. Meat Export Federation	Invited Speaker
5/2010	Overview of the U.S. Beef Industry. Presented to delegation of Russian meat importers at the request of the U.S. Meat Export Federation	Invited Speaker
5/2010	What is quality? The propensity of foreign customers of U.S. pork to pay for pork quality attributes in select export markets. Presented at the U.S. Meat Export Federation Board of Directors Meeting, May 27, St. Louis, MO. U.S. Meat Export Federation	Invited Speaker
5/2010	Factors influencing pork palatability. Presented in St. Louis, MO to U.S. Meat Export Federation Annual Meeting.	Invited Speaker
6/2010	American Meat Science Association, Reciprocal Meat Conference, Lubbock, TX	Participant
6/2010	Intercollegiate Meat Coaches Association Board Meeting - RMC Lubbock, TX	President Elect/Participant
6/2010	National 4H Advisory Board Meeting –RMC Lubbock, TX	Chairperson/Speaker
6/2010	US beef industry overview and packing plant tour. Beef University.	Host/Invited Speaker
6/2010	The importance of monitoring animal disease and TSE's in the livestock industry. CSU Diagnostic Laboratory. Presented to State Representative Betsy Markey	Invited Speaker
6/2010	CSU Beef University : 2 day conference, Fort Collins, CO. Beginning with the End in Mind.	PI/Host/Coordinator
6/2010	Beef value cuts fabrication demonstration for beef producers. CSU Beef University.	Invited Speaker
6/2010	Comprehensive consumer sensory panel ratings and establishing baseline tenderness of American lamb meat. Project update. Presented to the American Lamb Board	Invited Speaker
6/2010	MONTANA BEEF COUNCIL Dietetic Seminar Organic, Natural and Grass Fed Beef: Perception vs. Reality. Presented in Billings, MT	Invited Speaker
6/2010	Murphy, R. G. L., D. R. Woerner, and K. E. Belk. 2010.	Invited Speaker

Mo/Yr	Program Title or Purpose	Nature of Participation
	What is quality? The propensity of foreign customers of U.S. pork to pay for pork quality attributes in select export markets. Presented results of study to National Pork Producers' Council Meeting; Minnapolis, MN.	
7/2010	Beef Production & BSE Mitigation. Egyptian Delegation Visit with US Meat Export Federation	Invited Speaker
8/2010	American Homestead National Pork Meeting. Overview and issues facing the red meat industry. Production Practices and animal welfare. Fort Collins, CO	Invited Speaker
8/2010	Overview of the U.S. Beef Industry. Presented to delegation of Japanese media at the request of the U.S. Meat Export Federation	Invited Speaker
9/2010	Murphy, R. G. L., D. R. Woerner, and K. E. Belk. 2010. What is quality? The propensity of foreign customers of U.S. pork to pay for pork quality attributes in select export markets. September 3, Fort Collins, CO. Presented results of study in Webinar to the National Pork Board, Des Moines, IA.	Invited Speaker
9/2010	Guest Lecture: ANEQ 286 Lab Practicum; Introduction to meat product evaluation and meat judging.	Guest Lecturer
9/2010	What is quality? The propensity of foreign customers of U.S. pork to pay for pork quality attributes in select export markets. Presented at the National Pork Producer's Council Meeting Minneapolis, MN	Invited Speaker
9/2010	Overview of the U.S. Beef Industry. Presented to team of Japanese journalists at the request of the U.S. Meat Export Federation	Invited Speaker
9/2010	Maintaining and emphasis on meat animal production and understanding carcass information from you livestock projects. West Colorado State Fair Carcass Contest	Outreach/Invited Speaker
9/2010	NWSS Hide Party, Denver, CO; U.S. Red Meat Display	Demonstration Leader
10/2010	Guest Lecture: ANEQ 478 Beef Systems Capstone Course: Overview of Beef Industry, Industry Challenges, Beef Demand, and Beef Palatability.	Guest Lecturer
10/2010	Meat quality and safety issues facing the beef industry. 2010. Presented at the Colorado Red Angus and Simmental Field Day	Invited Speaker
10/2010	OHIO BEEF COUNCIL Dietetic Seminar Organic, Natural and Grass Fed Beef: Perception vs. Reality. Presented in Columbus, OH	Invited Speaker
10/2010	"Experiences of nutritional labeling and its influence on	Invited Speaker

Mo/Yr	Program Title or Purpose	Nature of Participation
	consumption habits and consumer education in the EU and North America". Presented at the International Forum THE ROLE OF RED MEATS IN A HEALTHY DIET. Mexico City, Mexico	
10/2010	"Nutrients in pork and beef. Nutrient composition of various types of beef (grass-fed versus grain-fed, natural and organic)". Presented at the International Forum THE ROLE OF RED MEATS IN A HEALTHY DIET. Mexico City, Mexico.	Invited Speaker
11/2010	Round aging and nutrition studies. NCBA Innovative Beef Symposium	Invited Speaker
11/2010	Marketing culled cows. Presented at Colorado Cattlemen's Convention. Colorado Springs, CO	Invited Speaker
12/2010	What is quality? The propensity of foreign customers of U.S. pork to pay for pork quality attributes in select export markets. December 21- 22, Fort Collins, CO. Presented results of study in webinar to 7 companies for the National Pork Board, Des Moines, IA.	Invited Speaker
1/2011	Western National Roundup, National 4H and FFA Meat Judging Contest	Coordinator/Host/Superintendent/Official
1/2011	National Western Stock Show Fed Beef and Youth Carcass Contest	Superintendent
1/2011	Greeley Farm Show Ag Forum: What are today's beef consumers demanding, and how is the industry responding?	Invited Speaker
1/2011	Beef Fabrication Demonstration for Young Ranchers International Group.	Invited Speaker
3/2011	Research Chef's Association Annual Convention- The Flavor of Beef. Atlanta, GA.	Invited Speaker
3/2011	Meat quality in animals raised for livestock shows. Larimer, Weld, Boulder, and Adams County Livestock Field day.	Outreach/Invited Speaker
3/2011	Update- Mandatory Nutritional Labeling for Single Ingredient Foods. Colorado Association of Meat Processors Annual Meeting.	Invited Speaker
3/2011	Guest Lecture: ANEQ 286 Lab Practicum; Introduction to meat product evaluation and meat judging.	Guest Lecturer
6/2011	American Meat Science Association, Reciprocal Meat Conference, Manhattan, KS	Participant
6/2011	Intercollegiate Meat Coaches Association Board Meeting - RMC Manhattan, KS	President /Participant
6/2011	National 4H Advisory Board Meeting –RMC Manhattan, KS	Chairperson/Speaker
6/2011	Overview of the U.S. Beef Industry. Presented to	Invited Speaker

Mo/Yr	Program Title or Purpose	Nature of Participation
6/2011	delegation of Korean Beef and Pork Customers at the request of the U.S. Meat Export Federation Overview of the U.S. Beef Industry. Presented to delegation of Mexican Beef Customers at the request of the U.S. Meat Export Federation	Invited Speaker
6/2011	CEV Multimedia Ideation Session for Online Degree Programs, Dallas, TX	Invited Participant
7/2011	American Meat Science Association and National 4H Advisory Committee Retail Identification Standards Development	Invited Participant/Creator
7/2011	US Pork Fabrication Techniques and the Quality of US Pork. July 27 - July 31. Panama City, Panama	Invited Speaker
9/2011	CO Environmental Health Professionals Annual Convention: The safety of dried, smoked, and cured meat products.	Invited Speaker
9/2011	NWSS Hide Party, Denver, CO; U.S. Red Meat Display	Demonstration Leader
10/2011	Guest Lecture: ANEQ 478 Beef Systems Capstone Course: Overview of Beef Industry, Industry Challenges, Beef Demand, and Beef Palatability.	Guest Lecturer
10/2011	Guest Lecture: ANEQ 286 Lab Practicum; Introduction to meat product evaluation and meat judging.	Guest Lecturer
11/2011	Overview of Beef Fabrication. Presented to delegation of South American Beef Customers at the request of the U.S. Meat Export Federation	Invited Speaker
11/2011	Colorado State University Animal and Meat Science Research Update. November 15th. T-Bone Club Eaton, CO	Invited Speaker
1/2012	Western National Roundup, National 4H and FFA Meat Judging Contest	Coordinator/Host/Superintendent/Official
1/2012	National Western Stock Show Fed Beef and Youth Carcass Contest	Superintendent
2/2012	National BBQ Association. Beef Flavors for BBQ. Presented at National Annual Meeting. San Diego, CA	Invited Speaker
2/2012	National Cattlemen's Beef Association Meetings Cattlemen's College National Beef Quality Audit Update. Nashville, TN	Invited Speaker
2/2012	JBS with Elanco and Merck: Impacts of Beta Agonists on Heat Stress in Cattle	Invited Speaker
3/2012	Four County 4H Livestock Field Day: Show ring ethics and quality assurance principles affecting the quality of meat products. Loveland, CO	Outreach/Invited Speaker
3/2012	CO and WY Annual Meat Processing Convention: Improving the quality of processed products	Outreach/Invited Speaker
3/2012	Houston Livestock Show and Rodeo: Intercollegiate Meat Judging Contest Official Committee Member	Outreach/Official Judge
3/2012	Guest Lecture: FTEC 574. Current Issues in Food Safety.	Guest Lecture

Mo/Yr	Program Title or Purpose	Nature of Participation
3/2012	Guest Lecture: ANEQ 180A (Bernie’s class) this spring on “Societal issues arising out of animal agriculture”: Harvest and Food Safety.	Guest Lecture
4/2012	Beef Magazine: Interview for Article	Outreach/Interview
4/2012	CEV Multimedia: Video Interview-Lean, Finely Textured Beef	Outreach/Interview
4/2012	Colorado Youth Science Fair: Official Project Judge	Outreach/Judge
4/2012	National Beef Quality Audit Strategy Workshop for 2011 Beef Quality Audit	Invited Speaker/Collaborator
4/2012	Guest Lecture: ANEQ 286 Lab Practicum; Introduction to meat product evaluation and meat judging.	Guest Lecturer
4/2012	Vermont Dietetics Association Annual Conference: Conventional, Natural, and Organic Production Perception vs. Reality, Burlington, VT	Invited Speaker
4/2012	Colorado State FFA CDE: Meat Evaluation Contest	Outreach/Host/Official
5/2012	Colorado State 4H Meat Evaluation Contest	Outreach/Host/Official
5/2012	Overview of the U.S. Beef Industry. Presented to delegation of Uruguayan Beef and Pork Customers at the request of the U.S. Meat Export Federation	Invited Speaker/Host
5/2012	Overview of the U.S. Beef Industry. Presented to delegation of Korean Beef and Pork Customers at the request of the U.S. Meat Export Federation	Invited Speaker/Host
5/2012	Colorado Extension Agents Meeting Demonstration: Preparation and safety of smoked meats.	Outreach/Invited Speaker
6/2012	Golden Trends Jr. Angus Show: Steak tasting demonstration	Outreach/Invited Speaker
6/2012	American Meat Science Association, Reciprocal Meat Conference, Fargo, ND	Participant
6/2012	Intercollegiate Meat Coaches Association Board Meeting - RMC Fargo, ND	Past President /Participant
6/2012	National 4H Advisory Board Meeting –RMC Fargo, ND	Chairperson/Speaker
6/2012	What is quality? The propensity of foreign customers of U.S. pork to pay for pork quality attributes in select export markets. Webinar currently resides on the National Pork Board Website	Invited Speaker
7/2012	U.S. Beef Industry Overview and Fabrication Demonstration. Presented at the U.S. Meat Export Federation Latin American Showcase. Bogota, Columbia	Invited Speaker
7/2012	U.S. Pork Industry Overview and Fabrication Demonstration. Presented at the U.S. Meat Export Federation Latin American Showcase. Bogota, Columbia	Invited Speaker
8/2012	Overview of the U.S. Beef Industry and Cutting Demonstration. Presented to delegation of Caribbean and Russian Beef and Pork Customers at the request of the U.S. Meat Export Federation	Invited Speaker/Host

Mo/Yr	Program Title or Purpose	Nature of Participation
8/2012	Overview of the U.S. Beef Industry, Cutting Demonstration, and Steak Tasting. Presented to delegation of Caribbean Chefs at the request of the U.S. Meat Export Federation	Invited Speaker/Host
8/2012	Beef Innovations Group Team Meeting	Team Member/Invited Participant
9/2012	U.S. Beef Industry Overview and Fabrication Demonstration. Presented for the U.S. Meat Export Federation to U.S. customers in Lima, Peru	Invited Speaker
9/2012	U.S. Beef Industry Overview and Fabrication Demonstration. Presented for the U.S. Meat Export Federation to U.S. customers in Santiago, Chile	Invited Speaker
9/2012	U.S. Beef Industry Overview and Fabrication Demonstration. Presented for the U.S. Meat Export Federation to Chefs in Santiago, Chile	Invited Speaker
9/2012	Issues facing production agriculture. Presented to the Weld County Water Conservation District Ag Tour.	Invited Speaker
9/2012	Beef Production Practices Steak Demonstration. CSU Animal Science Alumni Gathering.	Host/Speaker
9/2012	U.S. Beef Industry Overview and Fabrication Demonstration. Presented for the U.S. Meat Export Federation to U.S. importers in Antigua, Guatemala	Invited Speaker
9/2012	NWSS Hide Party, Denver, CO; U.S. Red Meat Display	Demonstration Leader
10/2012	Guest Lecture: ANEQ 478 Beef Systems Capstone Course: Overview of Beef Industry, Industry Challenges, Beef Demand, and Beef Palatability.	Guest Lecturer
10/2012	U.S. Beef Industry Overview and Fabrication Demonstration. Presented for the U.S. Meat Export Federation to U.S. importers in San Jose, Costa Rica	Invited Speaker
11/2012	Guest Lecture: ANEQ 286 Lab Practicum; Introduction to meat product evaluation and meat judging.	Guest Lecturer
11/2012	Official Committee Member. American Meat Science Association International Intercollegiate Meat Judging Contest, Dakota City, NE	Official Judge
11/2012	Beef + Transparency = Trust Media Seminar. CSU and Colorado Beef Council. Denver, CO	Host/Speaker
11/2012	Colorado Ranch Practicum Meeting. Beef Industry Overview and Fabrication Demonstration.	Outreach/Invited Speaker
11/2012	FOX News Channel: Grass-fed Beef Segment; National Audience, In Press and Video Broadcast	Speaker/Interviewee
11/2012	National Western Stock Show Nick Petry Workshop. Presentation: Beef Industry Challenges and Opportunities	Invited Speaker
12/2012	Beef 101: U.S. Meat Export Federation Middle East Team	Host/Organizer/Speaker
1/2013	Western National Roundup, National 4H and FFA Meat Judging Contest	Coordinator/Host/Superintendent/Official

Mo/Yr	Program Title or Purpose	Nature of Participation
1/2013	International Livestock Congress Student Program Lunch Speaker: The U.S. Meat Industry	Host/Invited Speaker
1/2013	National Western Stock Show Fed Beef and Youth Carcass Contest	Superintendent
2/2013	National BBQ Association Annual Convention, Mobile, AL- Science of Smoke	Invited Speaker
2/2013	Drovers Magazine: Video Interview – Challenges Facing the Beef Industry, Portion Sizing Cuts- NCBA Annual Convention, Tampa, FL	Interviewee
2/2013	NCBA Annual Convention, Tampa, FL – National Veal Producer’s Council Meeting – Veal Nutritional Profiling Update	Invited Speaker
4/2013	Guest Lecture: ANEQ 286 Lab Practicum; Introduction to meat product evaluation and meat judging.	Guest Lecturer
4/2013	Guest Lecture: ANEQ 180A (Bernie’s class) this spring on “Societal issues arising out of animal agriculture”: Harvest and Food Safety.	Guest Lecture
4/2013	President’s Ag Advisory Council Meeting: Center for Meat Safety and Quality Research Update	Invited Guest Speaker
5/2013	Colorado State FFA CDE: Meat Evaluation Contest	Outreach/Official
5/2013	Colorado State 4H Meat Evaluation Contest	Outreach/Official
5/2013	Rocky Mountain Food Safety Conference, Denver, CO. The production and safety of dried and fermented meats.	Invited Speaker
6/2013	American Meat Science Association, Reciprocal Meat Conference, Auburn, AL	Participant
6/2013	Intercollegiate Meat Coaches Association Board Meeting - RMC Auburn, AL	Board Member /Participant
6/2013	National 4H Advisory Board Meeting –RMC Auburn, AL	Chairperson/Speaker
8/2013	NCBA Annual Convention, Nashville, TN; Consumer preferences for steak cookery and thickness.	Speaker/Demonstration
8/2013	Overview of US Beef and Pork Products- 3 rd Annual Latin American Showcase USMEF – Antigua, Guatemala	Invited Speaker
9/2013	Science of Smoke Presentation Sonny’s Annual BBQ Convention, Orlando, FL	Invited Speaker
9/2013	NWSS Hide Party, Denver, CO; U.S. Red Meat Display	Demonstration Leader
10/2013	Guest Lecture: ANEQ 286 Lab Practicum; Introduction to meat product evaluation and meat judging.	Guest Lecturer
10/2013	Guest Lecture: ANEQ 478 Beef Systems Capstone Course: Overview of Beef Industry, Industry Challenges, Beef Demand, and Beef Palatability.	Guest Lecturer
10/2013	Guest Lecture: FTEC 210, Science of Food Fermentation. Fermented Meat Products	Guest Lecturer
10/2013	Appeared on NCBA Cattlemen to Cattlemen USMEF in Guatemala	Invited Speaker
12/2013	U.S. Beef Industry Overview and Beef Fabrication Short-	Invited Speaker

Mo/Yr	Program Title or Purpose	Nature of Participation
	course- INIA Tacuarembó, Uruguay	
1/2014	National Pork Board International Trade Committee Meeting	Participant/Speaker
1/2014	Western National Roundup, National 4H and FFA Meat Judging Contest	Coordinator/Host/Superintendent/Official
1/2014	National Western Stock Show Fed Beef and Youth Carcass Contest	Superintendent
1/2014	International Livestock Congress Student Program Lunch Speaker: The U.S. Meat Industry	Host/Invited Speaker
2/2014	NCBA Annual Convention, Nashville, TN; Consumer preferences for steak cookery and thickness.	Speaker/Demonstration
2/2014	Beef Industry Overview and Innovative Cutting Demo, Marshall Frasier Symposium, Hugo, CO	Invited Speaker
2/2014	Beef Demand and CMSQ Research Update- Front Range Livestock Assoc. Annual Meeting, NWSS Complex, Denver, CO	Invited Speaker
2/2014	Colorado Governor's Ag Forum – Denver, CO. Consumer Preferences for Beef Products – Nutrition, Safety, and Flavor-	Invited Speaker
3/2014	National BBQ Association Annual Convention: San Marcos, TX: Beef Fabrication Demonstration	Host/Invited Speaker
3/2014	Colorado and Wyoming Association of Meat Processors Annual Convention: Cured Meat Competition Sessions	Official/Speaker
3/2014	NCBA Beef Innovations Group: Innovative Beef Carcass Cutting Sessions, Greeley, CO	Invited Speaker/Demonstrator
3/2014	Leachman Cattle of Colorado. Pre-sale producers' seminar. The importance of marbling.	Invited Speaker
4/2014	NCBA Beef Flavor Focus Group – Ideation Session, Centennial, CO	Invited Speaker
4/2014	RFD TV NCBA's Cattlemen to Cattlemen TV Show: Lean Matters Beef Nutritional Research Update, National Television	Invited Speaker/Interviewee
4/2014	Colorado Science Fair: Special Category Judge; Meat Science and Food Safety	Outreach/Invited Judge
3/2014	Guest Lecture: ANEQ 180A (Bernie's class) this spring on "Societal issues arising out of animal agriculture": Harvest and Food Safety.	Guest Lecture
5/2014	Colorado State FFA CDE: Meat Evaluation Contest	Outreach/Host/Official
5/2014	Colorado State 4H Meat Evaluation Contest	Outreach/Host/Official
5/2014	Drover's Industry Tour: Fort Collins, CO- Meat Science Research Update	Invited Speaker
5/2014	Desert Land and Livestock Visit to CSU – Research Update and Facility Tour	Host/Speaker
5/2014	NCBA Beef Innovations Group – Beef carcass innovative cutting workshop	Host/Demonstrator

Mo/Yr	Program Title or Purpose	Nature of Participation
6/2014	U.S. Meat Export Federation: Japanese Grading Officials Visit: Overview of U.S. Grading Systems	Host/Speaker
6/2014	American Meat Science Association, Reciprocal Meat Conference, Madison, WI	Participant
6/2014	Intercollegiate Meat Coaches Association Board Meeting - RMC Madison, WI	Board Member /Participant
6/2014	National 4H Advisory Board Meeting –RMC Madison, WI	Chairperson/Speaker
6/2014	National Pork Board Webinar: Variety Meats In Export Markets	Invited Presenter
8/2014	U.S. Meat Export Federation: Japanese Student Interns Visit: U.S. Meat Industry Overview and Tour	Host/Speaker
8/2014	NCBA Beef Innovations Group Annual Meeting – Innovative Fabrication Group, Wooster, OH	Invited Participant/ Demonstrator
8/2014	U.S. Meat Export Federation: Mexican Political Delegates Visit	Host/Speaker
8/2014	Zinpro Animal Health Meat Science Research Update, Fort Collins, CO	Host/Speaker
9/2014	Guest Lecture: ANEQ 101 Introduction to Animal Science; Introduction to Meat Science	Guest Lecturer
9/2014	U.S. Meat Export Federation International Product Ideation Conference, Iowa State University, Ames, IA	Invited Speaker / Demonstrator
9/2014	U.K. Cowman: Visiting Beef Producers: Overview of consumer demands about beef, including beef palatability, consumer trends	Invited Speaker
10/2014	Birko Corp. Strategic Alliance Meeting, Henderson, CO	Participant
10/2014	U.S. Meat Export Federation Japanese ALIC Team Visit	Host/Invited Speaker
10/2014	Colorado Pork Producers Council Young Pork Producers’ Meeting; Pork carcass quality and fabrication demonstration	Invited Speaker/Outreach
10/2014	Birko Corp. Strategic Alliance Meeting, Fort Collins, CO	Participant
10/2014	CA ARPAS Annual CEC Meetings – “A year in the life” Turning Muscle Into Meat; Coalinga, CA	Invited Speaker
2/2015	National Cattlemen’s Beef Association Annual Convention, Cattlemen’s College – Value of Market Cows	Invited Speaker
3/2015	Colorado and Wyoming Association of Meat Processors Annual Convention, Fort Collins, CO	Event Coordinator
3/2015	Colorado and Wyoming Association of Meat Processors Annual Convention, Fort Collins, CO, Competition BBQ Seminar	Invited Speaker
3/2015	Colorado and Wyoming Association of Meat Processors Annual Convention, Fort Collins, CO, Innovative Carcass Fabrication	Invited Speaker
8/2015	Beef University Program – 3 day 100 participants- Zoetis, Fort Collins, CO	Organizer/Host/Speaker
11/2015	The Value of Market Cows and Their Carcasses, Hawaiian	Invited Speaker

Mo/Yr	Program Title or Purpose	Nature of Participation
1/2016	Cattlemen's Annual Convention, Kona, HI Intercollegiate Meat Judging Contest Official, National Western, Greeley, CO	Contest Chairman
6/2016	Beef Empire Days Carcass Show Judge	Invited Judge
8/2016	National Pork Board Variety Meat Workshop, Ames, IA	Invited Speaker
8/2016	JBS Beef University – 2 day event, Costco	Host/Coordinator/Speaker
10/2016	NPB and USMEF Variety Meat Workshop, Medellin Columbia	Invited Speaker
10/2016	National Renderers Association Meeting – Research Presentation	Invited Speaker
11/2016	Taste of the Hawaiian Front Range, Kona, HI	Invited Speaker
11/2016	An Overview of the U.S. Beef Grading System, Aldam Stockman's School – Aldam Estate, South Africa	Invited Keynote Speaker
1/2017	IPPE – Beef Workshop for NAMI, Atlanta, GA	Invited Speaker
2/2017	Colorado Governors Ag Forum – Denver, CO	Invited Speaker/Panelist
2/2017	Piedmonte Region Annual Beef Conference, Siler City, NC	Invited Speaker
4/2017	JBS Beef University – 2 day event, JBS Internal Group	Host/Coordinator/Speaker
5/2017	JBS Beef University – 2 day event, Ben E. Keith	Host/Coordinator/Speaker
6/2017	Beef Empire Days Carcass Show Judge	Invited Judge
6/2017	AMSA RMC – Concurrent Session Speaker, College Station, TX	Invited Speaker
6/2017	JBS Grass Run Farms Demonstration, LaCrosse, WI	Invited Speaker
6/2017	JBS Beef University – 2 day event, Halpern's	Host/Coordinator/Speaker
7/2017	JBS Beef University – 2 day event, Harvest Meat Co.	Host/Coordinator/Speaker
7/2017	USMEF ASEAN – Pork Variety Meats Demo, Philippines	Invited Speaker
7/2017	USMEF ASEAN – Pork Variety Meats Demo, Ho Chi Minh City, Vietnam	Invited Speaker
8/2017	JBS Beef University – 2 day event, AWG	Host/Coordinator/Speaker
9/2017	JBS Beef University – 2 day event, Meijer Retail	Host/Coordinator/Speaker
9/2017	AMSA Technical Planning Committee Meeting for 2018 RMC	Chairperson/Coordinator
10/2017	JBS Grass Run Farms Demonstration, LaCrosse, WI	Invited Speaker
10/2017	Colorado Boxed Beef – Taste of CO Education Forum, Orlando, FL	Invited Speaker
10/2017	Beef Carcass Demo - JBS Grass-Run Farms Event – LaCrosse, WI	Invited Speaker
11/2017	Intercollegiate Meat Judging Contest Official, International Contest, Dakota City, NE	Official Committee
1/2018	Western National Roundup 4H and FFA National Meat Judging Contest - 100 youth nationwide	Coordinator/Contest Superintendent
1/2018	NAMI Beef Flavor Workshop – IPPE Atlanta, GA	Invited Speaker/Program Co-Coordinator
2/2018	NCBA USDA Yield Grade Subcommittee Meeting	Speaker/Committee Member

Mo/Yr	Program Title or Purpose	Nature of Participation
5/2018	JBS Beef University - JBS Beef University – 2 day event, JBS Sales and R&D Team	Host/Coordinator/Speaker
6/2018	JBS Grass Run Farms Demonstration, LaCrosse, WI	Invited Speaker
7/2018	ASAS Early Career Award Research Presentation: Using REIMS to characterize the flavor profile of meat. Vancouver, BC	Award Winner/Invited Speaker
8/2018	Australian Meat Flavor Research Meeting – Opportunities with REIMS; Wagga Wagga, NSW, Australia	Invited Speaker
9/2018	JBS Grass Run Farms Demonstration, LaCrosse, WI	Invited Speaker
9/2018	Ankony Angus Premier Female Sale: The importance of beef quality and marbling. Clarksville, GA	Invited Speaker
9/2018	Hawaiian Cattlemens' Taste of the Hawaiian Range: Beef product demonstration. Waimea, HI	Invited Speaker
10/2018	Intercollegiate Meat Judging Contest Official, High Plains Contest, Friona, TX	Official Committee
11/2018	Keynote Speaker, District 2 4H Gold Star Banquet, Lubbock, TX	Invited Speaker
11/2018	Cargill Water Use and Sustainability Meeting with Plant Management and Engineers; Friona, TX	Organizer/Invited Speaker
11/2018	Cargill Packing Plant Tour – Tom McGuire Teys Australia; Friona, TX	Organizer/Host/Speaker
11/2018	Texas Tech Silver Spur Gala – Honoring Teys Australia (Tom McGuire), Lubbock, TX	Attendee
1/2019	Dairy Beef Industry Conference – A meeting of beef industry leaders integral to improving sustainability with beef on dairy production model; Lubbock, TX	Host/Organizer/Speaker
1/2019	Family and Consumer Sciences Teachers Association of Texas Midwinter Professional Development Conference – Engaging youth in meat science via BBQ; Lubbock, TX	Invited Speaker
1/2019	American Lamb Board Annual Meeting, The ability of REIMS as a novel quality segregating tool.; New Orleans, LA	Invited Speaker
1/2019	American Sheep Industry Annual Board Meeting; The ability of REIMS as a novel quality segregating tool. New Orleans, LA	Invited Speaker
2/2019	IPPE – NAMI Beef Workshop – Color, Caselife, and Packaging; Atlanta, GA	Invited Speaker
2/2019	Illinois and Indiana Meat Processors Convention – Beef Product Demonstration & The Science of Smoke; Bloomington, IL	Invited Speaker
3/2019	Rodeo Austin – Assistant Superintendent Jr. Steer Show	Assistant Superintendent
3/2019	Texas High School BBQ Association Regional Contest and Workshop – Host 2-day event and conduct workshop; Lubbock, TX	Host/Program Coordinator/Speaker
4/2019	JBS North America – Beef Carcass Fabrication Video	Invited Speaker/Producer

Mo/Yr	Program Title or Purpose	Nature of Participation
4/2019	Demonstration; Greeley, CO Cargill Beef Quality Summit – Meat Tenderness and Cookery & Beef Carcass Fabrication Demonstration; Oklahoma State University, Stillwater, OK	Invited Speaker/Host
4/2019	J.R. Simplot Research Update Meeting – Opportunities with Rapid Evaporative Ionization Mass Spectrometry (REIMS); Boise, ID	Invited Speaker
4/2019	North American Institute (NAMI) Meat Industry Summit; Speaker and Award Recipient; Carlsbad, CA	Award Recipient/Invited Speaker
5/2019	American Society of Animal Science Snack and Fact – A presentation on Capitol Hill to Ag Staffers about cultured meat products (What is Meat?); Longworth House Building, Washington, D.C.	Invited Speaker
5/2019	Meeting with North American Meat Institute (NAMI) – Cultured Meat; Washington, D.C.	Technical Representative
5/2019	Meeting with American Society of Animal Sciences – Cultured Meat; Washington, D.C.	Technical Representative
5/2019	Meeting with USDA-FSIS and Deputy Secretary Mindy Brashears – Cultured Meat; Washington, D.C.	Technical Representative
5/2019	Meeting with Food and Drug Administration Center for Food Safety and Applied Nutrition (CFSAN) – Cultured Meat; College Park, MD	Technical Representative
5/2019	ABS Global Meeting (North America, Asia, Australia, and Latin America) – Keynote: Addressing the sustainability of beef on dairy production scenarios; Amarillo, TX	Keynote/Invited Speaker
5/2019	Technical Advisory Committee to Livestock Marketing Information Center (LMIC) - An update from a meat science perspective on beef and lamb developments and issues.; NCBA, Denver, CO	Invited Speaker and Technical Representative
6/2019	ABS InFocus Regional Representative Training – Guest Keynote Speaker –Addressing the sustainability of beef on dairy production scenarios; Lubbock, TX	Keynote/Invited Speaker
7/2019	ASAS Animal Health Symposium - ASAS Annual, ASAS, Austin TX, "The impact of morbidity on carcass quality," International	Invited Speaker
7/2019	4H Livestock Ambassadors Workshop, Texas Agrilife Extension, Lubbock, TX, "Natural, Organic, and Convention Meat Production,"	Invited Speaker
8/2019	South African Wagyu Conference, SA Wagyu, Johannesburg South Africa, "Producing high quality beef," International.	Keynote/Invited Speaker
9/2019	Grass Run Farms Producer Event, JBS, LaCrosse, WI, "Beef Quality Demonstration,"	Keynote/Invited Speaker
9/2019	Certified Angus Beef Feeding Forum, Certified Angus Beef, Amarillo, TX, "Future of Beef Grading,"	Invited Speaker

Mo/Yr	Program Title or Purpose	Nature of Participation
10/2019	International. Taste of Colorado, Colorado Boxed Beef, Orlando, FL, "High Quality Beef," International.	Keynote/Invited Speaker
1/2020	IPPE: NAMI Meat Quality Workshop: Understanding yield, understanding profit. Atlanta, GA	Invited Speaker
3/2020	Piedmont Beef Conference: The value of high-quality beef and beef cutting demonstration. Pittsborough, NC	Keynote/Invited Speaker

GRADUATE STUDENT COMMITTEES: 69

Graduate Student	Completion Year	Degree	Faculty Role
Ryan Murphy	2010	Ph.D.	Committee Member
Cheyenne Dixon	2010	M.S.	Committee Member
Tonina Desimone	2011	M.S.	Committee Member
Filogomes Alves de Carvalho Neto	2011	M.S.	Committee Member
Curtis Pittman	2011	M.S.	Committee Member
Ashley Adams	2012	M.S.	Committee Member
Jessica Igo	2012	Ph.D.	Committee Member
Xiang (Crystal) Yang	2012	M.S.	Advisor
David Vargas	Withdrew	Ph.D.	Advisor
Travis Arp	2012	Ph.D.	Committee Member
Travis O'Quinn	2012	Ph.D.	Committee Member
Kristina Brenman	2012	M.S.	Advisor
Matthew Nunnally	2012	M.S.	Committee Member
Rebecca Acheson	2013	Ph.D.	Advisor
Scott Howard	2013	Ph.D.	Committee Member
Jordon McHenry	2013	M.S.	Advisor
Erin Karney	2014	M.S.	Advisor
Carlie Perham	2014	M.S.	Advisor
Jessica Steger	2014	M.S.	Advisor
Megan Webb	2014	M.S.	Advisor

Graduate Student	Completion Year	Degree	Faculty Role
Danielle (Dani) Shubert	2015	M.S.	Advisor
Megan Semler	2015	M.S.	Advisor
Shannon Coleman	2015	Ph.D.	Committee Member
Santiago Luzardo-Villar	2015	Ph.D.	Committee Member
Cody Gifford	2015	M.S.	Advisor
Dan Sewald	2015	M.S.	Advisor
Kaycee Vollmar	2015	M.S.	Committee Member
Brittney Scott-Bullard	2015	M.S.	Committee Member
Tanner Adams	2015	M.S.	Advisor
Xiang (Crystal) Yang	2016	Ph.D.	Committee Member
Katie Rose McCullough	2016	Ph.D.	Committee Member
Travis Hoffman	2016	Ph.D.	Committee Member
Rinara Kiel	2016	M.S.	Committee Member
Talita De Paula E Mancilha	2016	M.S.	Advisor
Rachel Murphy	2016	M.S.	Committee Member
Joshua Hasty	2017	Ph.D.	Advisor
Pablo Roveria	2017	Ph.D.	Committee Member
Brenna Klauer	2019	M.S.	Advisor
Guy Kunz	2017	M.A.	Committee Member
Blake Foraker	2018	M.S.	Advisor
Brianna Britton	2018	M.S.	Advisor
Cody Gifford	2018	Ph.D.	Advisor
Hannah Kesterson	2018	M.S.	Advisor
Blanchefort Allahodjibeye Djimsa	2019	Ph.D.	Advisor
Karissa Maneotis	2018	M.S.	Advisor
Devin Gredell	2018	Ph.D.	Advisor
Jennifer Levey	2018	M.S.	Committee Member
Clay Carlson	2019	M.S.	Advisor
Joanna Swenson	2019	M.S.	Advisor

Graduate Student	Completion Year	Degree	Faculty Role
Arquimedes Reyes	2019	Ph.D.	Committee Member
Ashley Lembke	2019	Ph.D.	Committee Member
Taylor Horton	2020	M.S.	Advisor
Tommy Fletcher	2020	M.S.	Committee Member
Cole Perkins	2020	M.S.	Committee Member
Kimberly Cerjan	2019	M.S.	Committee Member
Danielle Evers	2019	M.S.	Committee Member
Remio T Moreira	2020	M.S.	Committee Member
Clay Bendele	2020	M.S.	Committee Member
Andres Vargas	2020	M.S.	Committee Member
Kelly Vierck	2020	Ph.D.	Committee Member
Blake Foraker	2021	Ph.D.	Advisor
Jessica Sperber	Withdrawn	Ph.D.	Advisor
Jenna Frink	2021	M.S.	Advisor
Emily Bechtold	2021	M.S.	Advisor
Nicholas Hardcastle	2021	Ph.D.	Co-Advisor
Meghan Clancy	2022	M.S.	Co-Advisor
Hannah Frobose	2022	M.S.	Advisor
Bunjim Park	2022	Ph.D.	Advisor
Hope Vogelle	2020	Ph.D.	Committee Member
Cory Helmuth	2022	M.S.	Committee Member

Graduate Degrees Completed As Chair/Advisor: 25

- Rebecca J. Acheson, Ph.D.
- Mallory R. Emerson, M.S.
- Xiang (Crystal) Yang, M.S.
- Jordan M. McHenry, M.S.
- Erin D. Karney, M.S.
- Carlie C. Perham, M.S.
- Kristina Brenman, M.S.
- Megan J. Webb, M.S.

Jessica R. Steger, M.S.
Danielle Shubert, M.S.
Megan Semler, M.S.
Tanner S. Adams, M.S.
Joshua D. Hasty, Ph.D.
Daniel Sewald, M.S.
Karissa Maneotis, M.S.
Talita De Paula E Mancilha, M.S.
Cody Gifford, M.S., R.D.
Blake Foraker, M.S.
Devin Gredell, Ph.D.
Brianna Britton, M.S.
Blanchefort Djimsa, Ph.D.
Cody Gifford, Ph.D.
Brenna Klauer, M.S.
Hannah Kesterson, M.S., R.D.
Joanna Swenson, M.S.

Graduate Degrees in Progress as Chair or Co-Chair: 8

Taylor Horton - M.S.
Blake Foraker - Ph.D.
Emily Bechtold - M.S.
Jenna Frink - M.S.
Bunjim Park - Ph.D.
Hannah Frobose - M.S.
Meghan Clancy - M.S.
Nicholas Hardcastle - Ph.D.

Postdoctoral Advisees: 1

Blanchefort Djimsa, Ph.D.

UNDERGRADUATE ADVISING

STUDENT ADVISING/GRADUATE SUPERVISION
UNDERGRADUATE STUDENTS:

Year	Number of Undergraduate Advisees
Fall 2009	10
2010	20
2011	22
2012	22
2013*	16
2014*	4

*Note that the Department of Animal Sciences implemented a program that no longer required faculty to serve as an “advisor” for undergraduate students in 2013.

TEACHING RESPONSIBILITIES

<i>Term</i>	<i>Course</i>	<i>Title</i>	<i>Credits</i>	<i>Enrollme</i>	<i>*Evaluation Course/</i>
Fall 09	ANEQ 360	Principles of Meat Science	3	50	4.43/4.55
Fall 09	ANEQ 361	Intro to Meat Product Evaluation	3	21	4.57/4.57
Fall 09	ANEQ 470	Meat Science Capstone ¹	3	20	3.63/3.74
SP 10	ANEQ 362	Advanced Meat Product Evaluation	1	6	5.0/5.0
Fall 10	ANEQ 480	New/Experimental: Advanced Meat	4	16	4.8/4.8
		Systems			
Fall 10	ANEQ 361	Intro to Meat Product Evaluation	3	6	5.0/5.0
Fall 10	ANEQ 360	Principles of Meat Science	3	64	4.43/4.85
SP 11	ANEQ 362	Advanced Meat Product Evaluation	1	4	5.0/5.0
FA 11	ANEQ 480	New/Experimental: Advanced Meat	4	3	5.0/5.0

Systems					
FA 11	AN EQ 360	Principles of Meat Science	3	62	4.47/4.78
FA 11	AN EQ 361	Intro to Meat Product Evaluation	3	15	4.75/4.75
FA 11	AN EQ 362	Advanced Meat Product Evaluation	1	1	5.0/5.0
SP 12	AN EQ 567	HACCP	2	23	4.71/4.72
SP 12	AN EQ 362	Adv. Meat Product Evaluation	1	4	5.0/5.0
FA 12	AN EQ 470	Advanced Meat Processing Systems-	4	24	4.83/4.96
FA 12	AN EQ 362	Adv Meat Product Evaluation	1	3	5.0/5.0
FA 12	AN EQ 361	Intro to Meat Product Evaluation	3	20	4.67/4.93
SP 13	AN EQ 362	Advanced Meat Product Evaluation	1	11	4.80/5.0
SP 13	AN EQ 567	HACCP	2	7	4.50/4.71
FA 13	AN EQ 470	Advanced Meat Processing Systems-	4	29	4.76/4.75
FA 13	AN EQ 360	Principles of Meat Science	3	64	4.33/4.66
FA 14	AN EQ 470	Advanced Meat Processing Systems-	4	33	4.77/4.83
FA 14	AN EQ 360	Principles of Meat Science	3	92	4.56/4.4

FA 14	ANEQ 361	Intro to Meat Product Evaluation	3	19	4.78/4.90
SP 15	ANEQ 250	Live Animal and Carcass Evaluation	3	65	4.78/4.82
FA 15	ANEQ 250	Live Animal and Carcass Evaluation	3	105	4.66/4.73
FA 15	ANEQ 361	Intro to Meat Product Evaluation	3	20	4.93/5.0
FA 15	ANEQ 362	Advanced Meat Product Evaluation	1	12	5.0/5.0
SP 16	ANEQ 470	Advanced Meat Processing Systems-	4	35	4.80/4.76
SP 16	ANEQ 362	Advanced Meat Product Evaluation	1	15	5.0/5.0
FA 16	ANEQ 361	Intro to Meat Product Evaluation	3	20	4.77/4.83
FA 16	ANEQ 362	Advanced Meat Product Evaluation	1	20	5.0/5.0
SP 17	ANEQ 470	Advanced Meat Processing Systems-	4	53	5.0/4.88
SP 17	ANEQ 250	Live Animal and Carcass Evaluation	3	125	4.65/4.50
SP 17	ANEQ 362	Advanced Meat Product Evaluation	1	10	5.0/5.0
FA 17	ANEQ 250	Live Animal and Carcass Evaluation	3	88	4.68/4.80
FA 17	ANEQ 361	Intro to Meat Product Evaluation	3	24	5.0/5.0
FA 17	ANEQ 362	Advanced Meat Product Evaluation	1	7	5.0/5.0
SP 18	ANEQ 250	Live Animal and Carcass Evaluation	3	98	4.75/4.65
SP 18	ANEQ 470	Advanced Meat Processing Systems-	4	47	4.83/4.87
SP 19	ANSC	Livestock and Meat Evaluation	3	93	4.5/4.5

SP 19	ANSC	Advanced Meat Science	4	11	4.8/4.8
FA 19	ANSC	Meat Industry	4	12	4.75/4.75
SP 20	ANSC	Livestock and Meat Evaluation	3	106	

*Mean evaluation scores are presented from the student surveys. The highest possible score is 5.0. Means for the overall course and the instructor are presented (e.g., 4.76/4.75).

Texas Education Agency Service

Texas Education Agency Science TEKS Review Committee Member (2019 – Present)

In 2019, I was selected as 1 of 12 members of the K-12 Science Curriculum Review Committee by the Texas Education Agency’s Board. The activities involve a complete review and revision of Texas TEKS for science curriculum for K-12. Reviews and revisions are further addressed and approved by the Texas Board of Education.

Examples of Course Improvements

The meat science capstone course at Colorado State, taught as ANEQ 470 Advanced Meat Processing Systems-Capstone, was improved as follows: 1) The course has been increased from a 3-credit lecture course to a 3-credit lecture course with a 1-credit laboratory section (4 total credits); 2) Students now experience a hands-on learning environment as the laboratory section involves meat processing exercise in the meat laboratory and with industry partners; 3) Students are expected to complete a final project, which is a finished product that is created in the meat laboratory using the principles learned in the course; 4) Students are exposed to many of the meat industry businesses located in the proximity of Colorado State University including JBS (world’s largest red meat and poultry company) beef and lamb harvest facilities, JBS/Pilgrim’s Pride Research and Development Center, Innovative Foods (small, privately-owned locker plant), Colorado Premium Foods (world’s largest manufacturer of corned beef), and various other further processors and food distributors (e.g., Sysco Denver, Freidman Distribution, Lombardi Brothers Meats, etc.).

Development of New Courses

In 2009, the Department of Animal Sciences at Colorado State was deficit a course offered in the meat science discipline that was a systems-based, hands-on course that addressed the topics of processed and cured meats, meat-animal anatomy, fresh meat processing, and carcass fabrication. As a result, ANEQ 480A Advanced Meat Processing Systems was developed and added as an experimental course in the Fall of 2010. The objectives of the newly developed course were: 1) The successful student enrolled in this course will develop an in-depth understanding of animal harvest, muscle nomenclature,

meat animal anatomy, conversion of muscle to meat, meat fabrication, fresh meat processing, and processed and cured meat processing; 2) The successful student enrolled in this course will develop an understanding of animal protein applications for everyday muscle foods; 3) The successful student enrolled in this course will have experienced a hands-on opportunity for an enhanced understanding of muscle foods; 4) The successful student enrolled in this course will have been introduced to commercial processing environments and facilities. The new course was offered twice as an experimental course, and it has been accepted by the university curriculum committee as an official course. It will be taught every fall semester as a 4-credit course as the meat science capstone class and labeled as: ANEQ 470 Advanced Meat Processing Systems-Capstone.

Descriptions of Mentoring Activities

In addition to undergraduate and graduate advising, I have served as the advisor for an undergraduate student working on her Honor's Thesis (Mary Emily Eubanks), and I have also served on another students Honor's Thesis committee.

Since 2007, I have been involved with the Meat Judging Program at Colorado State University. I served as the team's coach for 2 years (2007 & 2008), and I have served as the Meat Judging Team faculty advisor since 2009. In that time frame, there have been 98 undergraduate students that have served as team members, and 8 graduate students have served as team coaches. In the 9 years that I have worked with the program, CSU has earned many accolades including 2 National Championships, an international championship (Australian Intercollegiate Meat Judging Association (ICMJ)), 1 Reserve National Championship title, and has been named the Champion Team at 6 national contests. Prior to 2007, CSU had won 3 National Championships and 1 Reserve National Champion title in 26 years. Additionally, since 2007, the meat judging program has earned over \$2 million in fundraising efforts (not donations).

Also, in 2012 and 2018, the Meat Science Academic Quiz Bowl team earned a National Championship title at that American Meat Science Association's Reciprocal Meat Conference, and in 2014, CSU's team earned a Reserve National Champion title.

Other Evidence of Teaching

Visiting International Graduate Students:

In 2012, 2013, and 2017 I had the opportunity to welcome and advise 3 visiting students from Brazil. Each of the students spent 12 months working in our program, and both completed small research projects during the time they spent here.

- Felipe Syuffi Flavio Castro, B.S.; Sao Paulo, Brazil
- Felipe Roberto Amaral Ferreira Do Valle, M.S.; Rio de Janeiro, Brazil
- Matheus Baldini Cardoso, B.S. Universidade Estadua Paulista 'Julio de Mesquita Filho'

In 2020, I have 2 interns from Zamorano University in Honduras, one student is a native of Honduras while the other is a native of Guatemala. This is a research internship, and the students will complete small research projects and participate in research poster competitions.

Undergraduate Research Assistants:

In the past five years, I have supervised many undergraduate students who have served as research assistants in our sensory and microbiology laboratories. Each of these students were/are undergraduate students in Animal Science that expressed an interest in meat science research. These students were/are supported with hourly pay using funds from funded projects and service work contracted by the Center for Meat Safety and Quality. I have provided daily supervision to

each of the students, trained them to perform numerous procedures, and I have challenged them with leadership opportunities. In some cases, these students utilized this opportunity to fulfill internship credits, and in those cases, I assisted the student with data collection and data analysis.

Graduated Undergraduate Assistants:

- Mallory Emerson-Sikes, M.S.; Director of R&D, Colorado Premium Foods, Greeley, CO
- Samantha Plaggemeyer-Murnin, B.S.; Manager of Assoc. Marketing, National Cattlemen's Beef Association, Centennial, CO
- Cheyenne Dixon, M.S.; Manager Technical Services, U.S. Meat Export Federation, Denver, CO
- Jordan McHenry, M.S.; Communications and Social Media, IMI Global, Castle Rock, CO
- Erin Karney, M.S.; Quality Assurance Manager – Branded Programs, AgriBeef, Toppenish, WA, Colorado Beef Council Director of Membership, Denver, CO.
- Ashley Rosenberg, M.S.; Ph.D. Student, Texas Tech University, Lubbock, TX
- Megan Casino, B. S.; Regulatory Specialists, Ruprecht Company Wholesale Meats, Fox Lake, IL
- Scott T. Howard, Ph.D., Technical Services, Cargill Meat Solutions, Wichita, KS
- Danielle Shubert, B.S. Graduate Student, Colorado State University, Center for Meat Safety and Quality, Fort Collins, CO
- Megan Semler, B.S.; Graduate Student, Colorado State University, Center for Meat Safety and Quality, Fort Collins, CO
- Cody Gifford, B.S.; Graduate Student, Colorado State University, Center for Meat Safety and Quality, Fort Collins, CO
- Kaycee Vollmar, B.S.; Graduate Student, Colorado State University, Department of Animal Sciences, Fort Collins, CO
- Chloe Goodwin, B.S.; Student Veterinary Medicine, Texas A&M University Vet School, College Station, TX
- Margaret Weinroth, M.S.; Graduate Student, Colorado State University, Center for Meat Safety and Quality, Fort Collins, CO
- Jenna Oxenhandler, B.S.; Graduate Student, Colorado State University, Center for Meat Safety and Quality, Fort Collins, CO
- Alexa Tutor, JBS, USA; QA Pork Division, Greeley, CO
- Ally Fanning, Cargill Meat Solutions, Production Manager, Fort Morgan, CO
- Jacqueline Ponce, B.S., Graduate Student, Texas Tech University, Department of Animal And Food Sciences
- Karissa Maneotis, American Lamb Board, Director of Technical Programs, Denver, CO
- Aerial Belk, Colorado State University, Ph.D. Student, Fort Collins, CO
- Taylor Horton, Texas Tech University, M.S. Student, Lubbock, TX
- Megan Gifford, Sr Product Development Technician, JBS USA Beef, Greeley, CO
- Brenna Klauer, Sr. Food Technologist, Pilgrim's Pride, Greeley, CO
- Felicia Dueker, QA Supervisor, Mountain States Rosen
- Jenna Frink, Texas Tech University, M.S. Student, Lubbock, TX

CONTRACTS AND GRANTS

Externally-Funded Projects as PI: \$3,652,858

Year	Project, PI, Co-PI's, Sponsor	Project Number	Amount
2009 - 2010	Nutrient Database Improvement Research – BAM Cuts. Dale Woerner, Patricia A Kendall, Terry E Engle, and Keith Belk. National Cattlemen’s Beef Association.	53-82310	\$69,076
2010	Market Cow Fact Sheet. Dale Woerner. National Cattlemen’s Beef Association	53-57450	\$6,000
2010	Developing a Platform for Interactive Animation and Teaching Modules to Demonstrate Muscle Contraction. Dale Woerner, Joseph D Tatum, Gary C Smith, and Keith Belk. National Cattlemen’s Beef Association.	53-56930	\$20,000
2010	Interactive Beef Quality Assurance Workshop: “Beginning with the end in mind.” Dale Woerner, Joseph D Tatum, Gary C Smith, Travis Hoffman, Keith Belk, and Jason Kee Ahola. National Cattlemen’s Beef Association.	53-51150	\$5,750
2010	Muscles of the Round: Nutrient Composition of Cooked Cuts. Dale Woerner, Joseph D Tatum, Terry E Engle, and Keith Belk. National Cattlemen’s Beef Association.	53-51210	\$29,295
2010	An evaluation of carcass characteristics, longissimus muscle tenderness, and prevalence of E. coli O157:H7 and Salmonella of feedlot steers potentially exhibiting differences in heat stress response and behavior, as a result of implant strategy and β -adrenergic agonist supplementation. Dale Woerner, John J Wagner, Kurt David Vogel, Joseph D Tatum, Gary C Smith, Kendra Nightingale, Temple Grandin, Terry E Engle, Keith Belk, and Shawn Archibeque. JBS International.	53-83900	\$58,552
2010 - 2011	Nutrient Database Improvement Research – Phase IIB: Nutrient Analysis of Rib and Plate Cuts. Dale Woerner, Patricia A Kendall, Terry E Engle, and Keith Belk. National Cattlemen’s Beef Association.	53-51700	\$68,573

2010 - 2011	An Evaluation of the Effectiveness of Fresh Case Technology to Extend the Shelf-Life of Whole Muscle Beef and Ground Beef. Dale Woerner, John N Sofos, Gary C Smith, and Keith Belk. Bemis Company, Inc.	53-60030	\$43,193
2010 - 2011	An Evaluation of the Effectiveness of FreshCase Technology to Extend the Shelf Life of Whole Muscle Pork and Ground Pork Sausage. Dale Woerner, John N Sofos, Gary C Smith, and Keith Belk. Bemis Company, Inc.	53-60010	\$44,825
2011	Round Addendum for Industry Guide for Beef Aging. Dale R. Woerner. National Cattlemen’s Beef Association.	53-50120	\$5,000
2011	Recording of Commonly Exported Beef Offal Items. Dale Woerner. U.S. Meat Export Federation.	53-53730	\$5,000
2011 - 2012	Nutrient Database Improvement Research – Phase IIIA: Collection and Proximate Analysis of Loin and Round Cuts. Dale Woerner, Patricia A Kendall, Terry E Engle, and Keith Belk. National Cattlemen’s Beef Association.	53-55160	\$63,267
2012 - 2013	Nutrient Database Improvement Research – Phase IIIB: Collection and Proximate Analysis of Loin and Round Cuts. Dale Woerner, Patricia A Kendall, Terry E Engle, and Keith Belk. National Cattlemen’s Beef Association.	53-71520	\$58,277
2012 - 2013	Discovering ground beef performance through “premium grind” concepts. Dale R. Woerner, J. Daryl Tatum, T. E. Engle, and Keith E. Belk. National Cattlemen’s Beef Association.	53-58290	\$48,616
2012 - 2013	Effects of extended postmortem aging periods on the shelf-life and eating qualities of beef intended for retail sale. Dale R. Woerner, J. Daryl Tatum, and Keith E. Belk. National Cattlemen’s Beef Association.	53-58280	\$54,546
2012	Communicating the significance of the USDA Meat Grading System and ensuring the integrity of the grade in domestic and foreign markets using a video format. Dale R. Woerner, J. Daryl Tatum, and Keith E. Belk. U.S. Meat Export Federation.	53-56520	\$27,967

2012	Post Approval Study: Live Performance, Carcass Characteristics, Carcass Fabrication Yield and Strip Loin Palatability of Beef Steers Fed Varying Dosages and Potencies of Beta-Agonists. Dale Woerner, J. Daryl Tatum, and Keith Belk. Elanco Animal Health.	53-61810	\$29,936
2012	Recording of Commonly Exported Pork Offal Items. Dale Woerner and K. E. Belk. U.S. Meat Export Federation.		\$5,000
2012 - 2013	Post Approval Study: Live Performance, Carcass Characteristics, Carcass Fabrication Yield and Strip Loin Palatability of Holstein Steers Fed Varying Dosages and Potencies of Beta-Agonists. Dale Woerner, J. Daryl Tatum, and Keith Belk. Elanco Animal Health.	53-15870	\$39,785
2013	Shelf-life of master-bag packaged ground beef patties. D. R. Woerner and K. E. Belk. JBS USA, Beef Division.		\$2,800
2013	JBS Fall 2012 – Spring 2013 Service Projects. Dale R. Woerner, J. Daryl Tatum, and Keith Belk. JBS- Beef Technical Servies.	53-15660	\$49,631
2012 - 2013	Special-Fed Veal: A Complete Nutrient Analysis of Pertinent Veal Cuts. Dale R. Woerner, Rebecca Acheson, Terry Engle, J. Daryl Tatum, and Keith E. Belk. National Cattlemen’s Beef Association.	53-15710	\$55,000
2012 - 2013	Literature Review and Needs Assessment of Pathogen Reduction Technologies (PRTs) for Pork Products. Dale R. Woerner, J. Daryl Tatum, and Keith E. Belk. National Pork Board.	53-15830	\$12,948
2013 - 2015	U.S. Grain-Finished & Grass-Finished Lamb – A complete nutrient analysis of 10 lamb cuts and ground lamb. Dale R. Woerner, Travis W. Hoffman, Carlie Perham, Terry Engle, J. Daryl Tatum, and Keith E. Belk. National Lamb Board.	53-08214	\$124,984
2013 - 2014	An Evaluation of the Suitability of Porcine Lung Tissue for Human Consumption. Dale R. Woerner, Gary L. Mason, Hua Yang, J. Daryl Tatum, and Keith E. Belk. National Pork Board.	53-28671	\$79,786
2013 - 2014	Identifying the Consist of Preference for Beef Flavors Among Beef Consumers. Dale R. Woerner, J. Daryl Tatum, and Keith E. Belk. National Cattlemen’s Beef Association.	53-89850	\$60,721

2013 - 2014	Discovering consumer perceptions of the beef sensory experience with variable steak thickness and common cookery methods. Dale R. Woerner, J. Daryl Tatum, and Keith E. Belk. National Cattlemen’s Beef Association.	53-89860	\$40,157
2013 - 2014	Beef Cutout Calculator Update and Repair. Dale R. Woerner, J. Daryl Tatum, and Keith E. Belk. National Cattlemen’s Beef Association.	53-91700	\$6,500
2014	Grading Animation Storyboard. Dale Woerner, Joseph D Tatum, Keith Belk. National Cattlemen's Beef Association.	53-78006	\$10,000
2014	Block Ready Cutout Yield Determinations. Dale R. Woerner, J. D. Tatum, and K. E. Belk. JBS, USA, Beef Division.		\$7,500
2014 - 2015	Identifying the influence of cattle production history and lean muscle characteristics on specific beef flavor attributes. D. R. Woerner, J. D. Tatum, J. F. Legako, R. J. Delmore, and K. E. Belk. National Cattlemen’s Beef Association.	53-78045	\$139,756
2014 - 2015	Determining the process lethality of <i>Salmonella</i> and <i>Escherichia coli</i> O157:H7 in heat treated, rendered meat and poultry products. D. R. Woerner, I. Geornaras, H. Yang, R. J. Delmore, J. N. Sofos, and K. E. Belk. Fats and Proteins Research Foundation, Inc.	H01205340 1	\$24,608
2016	Ground Beef Retail Test; Woerner, D. R., Terry E Engle ; Hua Yang; Ifigenia Geornaras ; Jennifer Nicole Martin; Joseph D Tatum; Keith Belk; Robert J Delmore; JBS International	P000125364	\$58,239
2015 - 2016	Beef Rib Alternative Industry Cutting Trial; Woerner, D. R.; Jennifer Nicole Martin; Joseph D Tatum; Keith Belk; Robert J Delmore; NCBA-National Cattlemens Beef Association	P000125174	\$24,946
2015 - 2016	Characterizing Products from the Beef Rib Resulting from an Alternative Carcass Break; Woerner, D. R.; Jennifer Nicole Martin; Joseph D Tatum; Keith Belk; Robert J Delmore; NCBA-National Cattlemens Beef Association	H01233940 1	\$30,312

2015 - 2016	Conducting a Proof of Concept for Differentiating the Inherent Differences in Flavor that Exists Among American Lamb Using Volatile Flavor Compound Analysis and Olfactometry; Woerner, D. R.; Stephen B. LeValley; Jennifer Nicole Martin; Joseph D Tatum; Keith Belk; Robert J Delmore; American Lamb Board	P000124498	\$66,000
2015 - 2016	Phase I-Identifying the Influence of Rate of Cooking, Cooking Temperature, and Degree of Doneness on Factors Contributing to Beef Flavor and Tenderness; Woerner, D. R.; Jennifer Nicole Martin; Joseph D Tatum; Keith Belk; Robert J Delmore;	H01234230 1	\$89,894
2015 - 2016	Development of Raw, Fresh Pet Food Products; Dale Woerner; Jennifer Schissler Pendergraft ; Terry E Engle; Felix Michael Duerr; Jennifer Nicole Martin; Keith Belk; Craig B Webb; Paul S Morley; Robert J Delmore; JBS International	H01233350 1	\$80,019
2016 - 2017	Identifying the Influence of Post-Mortem Aging Length and Method on Flavor and Tenderness of Beef Strip Loins; Woerner, D. R., Gredell,Devin; Delmore,Robert; Tatum,Joseph D; Martin,Jennifer; Belk,Keith; Heuberger,Adam; National Cattlemen's Beef Association	P000126611	\$45,612
2016 - 2017	Phase II - Identifying the Influence of Rate of Cooking, Cooking Temperature, & Degree of Doneness on Compounds & Components Related with Flavor; Woerner, D. R., Tatum,Joseph D; Martin,Jennifer Nicole; Belk,Keith; Delmore,Robert; National Cattlemen's Beef Association	P000126154	\$30,945
2016 - 2017	Understanding The Impact of Carcass Size, Rate of Chilling, & Electrical Stimulation on Muscle Tenderness, Juiciness, & Color; Woerner, D. R., Tatum,Joseph D; Martin,Jennifer; Belk,Keith; Delmore,Robert; National Cattlemen's Beef Associatoin	P000125837	\$48,474
2016 - 2017	Beef Flavor Myology; Woerner, D. R., Tatum,Joseph D; Martin,Jennifer; Belk,Keith; National Cattlemen's Beef Association	P000126966	\$69,922

2016 - 2017	Woerner,Dale ; Martin,Jennifer Nicole; Engle,Terry E ; Belk,Keith; U.S. Beef Variety Meats - Nutrient Analysis of Nine Variety Meat Items; National Cattlemen's Beef Association	5350031	\$73,678
2016 - 2017	Woerner, Dale and Belk, Keith; Identifying altered metabolism and health effects from consuming beef cattle fed genetically modified crops; National Cattlemen's Beef Association.	5350032	\$8,000
2017 - 2018	Woerner,Dale ; Prenni,Jessica E ; Heuberger,Adam L ; Belk,Keith ; Delmore,Robert J ; Geornaras,Ifigenia; Metcalf,Jessica Lynne; Evaluating the Effects of Commonly Used Antimicrobial Intervention Spray Combinations on the Flavor Profile of Beef; National Cattlemen's Beef Association	5301315	\$76,906
2017 - 2018	Woerner,Dale ; Martin,Jennifer Nicole; Delmore,Robert J; Belk,Keith; Beef Flavor Myology - Round 2; National Cattlemen's Beef Association	5340195	\$81,726
2017 - 2018	Woerner,Dale ; Prenni,Jessica E ; Heuberger,Adam L ; Belk,Keith ; Delmore,Robert J ; Geornaras,Ifigenia; Metcalf,Jessica Lynne; Discovering the Capabilities of Rapid Evaporative Ionization Mass Spectrometry (REIMS) as a Novel Mass Spectrometry Method to Characterize Beef; National Cattlemen's Beef Association	5375533	\$94,296
2017 - 2018	Woerner,Dale ; Prenni,Jessica E ; Heuberger,Adam L ; Belk,Keith ; Delmore,Robert J ; Geornaras,Ifigenia; Metcalf,Jessica Lynne; Discovering the Capabilities of Rapid Evaporative Ionization Mass Spectrometry (REIMS) as a Novel Mass Spectrometry Method to Characterize Lamb; American Lamb Board		\$68,666
2017 - 2018	Colorado Pork Supply Chain and Quality Audit. Dale Woerner (PI). Colorado Pork Producers Council		\$20,000
2018 - 2019	Predicting Beef Flavor Differing in Lipid Heat Denaturation and Maillard Reaction Products, Woerner, Dale, J. F. Legako, J. C. Brooks; National Cattlemen's Beef Association		\$32,750

2018 - 2019	Woerner, Dale, J.F. Legako, J. C. Brooks. Evaluating Rapid Evaporative Ionization Mass Spectrometry (REIMS) as a novel, real time method for measuring and predicting beef flavor, tenderness, and nutritional value. National Cattlemen's Beef Association		\$89,980
2018 - 2019	An evaluation of the effects of supplementation of a novel feed additive on carcass characteristics and longissimus muscle characteristics of feedlot steers. Dale Woerner (PI), Mahesh Nair, Keith Belk. Elanco Animal Health		\$243,059
2019	Evaluating the supplementation of ground beef with beneficial fat sources added. Dale Woerner (PI); Cargill Meat Solutions		\$14,170
2019	Comparison of Internal Beef Brands. Woerner, Dale R. JBS USA.		\$15,000
2019	Sunfed Beef grass-fed comparison. Woerner, Dale R. Sun Fed Beef Inc.		\$8,800
2019 - 2020	Understanding the influence of beef x dairy crossbred cattle on eating quality, retail display, and chemical composition in beef strip loins. Dale Woerner (PI), Bake Foraker, Jerrad Legako, Bradley Johnson, J. Chance Brooks, Mark Miller. NCBA		\$111,208
2019 - 2020	Understanding the impact of reduced water use beef spray chilling system on beef carcass quality and saleable yield. Dale Woerner (PI), Jerrad Legako, J. Chance Brooks, Mark Miller. NCBA		\$139,202
2019 - 2020	Validating the ability of REIMS to differentiate lamb flavor performance based on consumer preference. Dale Woerner (PI), Jerrad Legako, J. Chance Brooks, Mark Miller, Jessica Prenni, Mahesh Nair, Keith Belk. American Lamb Board.		\$99,050
2019	Review: Sustainability of the dairy x beef model. Dale R. Woerner and Blake Foraker. Cargill		\$46,400

2019 - 2020	Evaluating Rapid Evaporative Ionization Mass Spectrometry (REIMS) As A Novel, Minimally Invasive, Real Time Method for Accessing Pork Belly Quality and Fat Composition. Woerner, D. (Principal), Legako, J. (Co-Principal), Brooks, J. C. (Co-Principal); National Pork Board		\$141,677
2019	McDonald's Beef Patty Cooking Validation. Woerner, Dale R. McDonald's Corp		\$16,456
2019 - 2021	Evaluating REIMS As A Novel, Minimally Invasive, Real Time Method For Predicting The Effects Of Aging On Beef Tenderness, Flavor, And Juiciness. Dale Woerner (PI), Jerrad Legako, J. Chance Brooks, Mark Miller, Jessica Prenni, Keith Belk, Tommy Wheeler, Steven Shackelford, D. Andy King; USDA-AFRI CARE		\$299,844
2020 - 2021	Nutrient Analysis of Prime Beef Cuts. Woerner, Dale R., Jerrad F. Legako, and Leslie C. Thompson. NCBA		88,891
2019 - 2021	Using Rapid Evaporative Ionization Mass Spectrometry (REIMS) as a novel, minimally invasive, real time method for characterization of metabolic variation contributing to flavor, tenderness, and color stability of beef. Dale Woerner (PI), Jerrad Legako, J. Chance Brooks, Mark Miller, Jessica Prenni, Keith Belk, Tommy Wheeler, Steven Shackelford, D. Andy King; NAMI		41,687.00
	Total Funding as PI:		\$3,652,858

Externally Funded Projects as Co-PI: \$7,303,042

Year	Project, PI, Co-PI's, Sponsor	Project Number	Amount
2007-2008	The History of Instrument Assessment of Beef. Keith Belk, Dale Woerner, Joseph D. Tatum, Gary C Smith, and John A Scanga. National Cattlemen's Beef Association.	53-50990	\$5,000

2008-2009	Use of Video Imaging Technology to Predict Cutability and Sensory Quality of Beef Products Generated from Mature Cows and Bulls. Keith Belk, Dale Woerner, Joseph D Tatum, Gary C Smith, and Terry E. Engle. National Cattlemen's Beef Association.	53-57930	\$199,414
2009-2010	Quantifying the Aging Response for Muscles of the Beef Round. Keith Belk, Dale Woerner, Joseph D Tatum, and Gary C Smith. National Cattlemen's Beef Association.	53-82230	\$73,636
2009-2010	Interaction of Copper Source, Bile Compositoin on Microbial Growth and Cu Protein Homeostasis. Terry E Engle, Dale Woerner, John J Wagner, Ivette Noami Roman-Muniz, Kendra Nightingale, Brett H Kirch, Hyungchul Han, Keith Belk, Shawn Archibeque, David B Anderson. Novus International, Inc.	53-60550	\$21,000
2010-2011	Can DNA Marker Technology Improve Feedlot Growth Promotion Management Decisions to Ultimately Improve the Consumer's Beef Eating Experience? John J Wagner, Dale Woerner, Richard Kraig Peel, Terry E Engle, and Jason Kee Ahola. National Cattlemen's Beef Association.	53-55900	\$46,620
2010-2011	Relationships of USDA Camera-Based Quality Grades to be Beef Palatability Attributes. Joseph D Tatum, Dale Woerner, Gary C Smith, and Keith Belk. National Cattlemen's Beef Association.	53-51540	\$70,675
2010-2011	Evaluation of Chemical Decontamination Treatments for Beef Trimmings against Escherichia coli O157:H7, Non-O157 Shigatoxin STECs. John N Sofos, Hua Yang, Dale Woerner, Gary C Smith, Kendra Nightingale, Ifigenia Geornaras, and Keith Belk. American Meat Institute Foundation.	53-55830	\$88,800

2010-2012	National Beef Quality Audit 2011: Phase I: Face to Face Interviews. Keith Belk, Dale Woerner, J. Daryl Tatum, Dustin L. Pendell, and Jessica L. Igo. National Cattlemen's Beef Association.	53-50350	\$105,250
2011-2012	Effect of Zinc Source and Optaflexx on the Growth Performance and Carcass Characteristics of Steers Fed in Confinement. John J. Wagner, Dale Woerner, Richard Kraig Peel, and Terry E. Engle. Elanco Animal Health.	53-61110	\$91,930
2011-2012	Identifying consumer preferences for specific beef flavor characteristics. J. Daryl Tatum, Dale Woerner, Terry E. Engle, Shawn Archibeque, and Keith Belk. National Cattlemen's Beef Association.	53-56150	\$89,525
2011-2012	Effect of MINTREX Zn Supplementation for Feedlot Beef Cattle Fed Ractopamine. Terry E. Engle, Dale Woerner, and John J. Wagner. Novus International, Inc.	53-61060	\$66,594
2011-2012	North American Beef Quality Check. Keith Belk, Dale Woerner, and J. Daryl Tatum. Elanco Animal Health.	53-82590	\$140,625
2011-2012	Supplementation of Rumen Polyunsaturated Fatty Acids (PUFA) to Increase Muscle PUFA in Corn-Fed Beef Steers. Hyungchul Han, John J Wagner, Terry E Engle, Shawn Archibeque, Dale Woerner, and Ivette Noami Roman-Muniz. Colorado Corn Administrative Committee.	53-56330	\$48,400
2011-2012	Inclusion of Amaize in Steam-Flaked Corn-Based Finishing Diets. John J. Wagner, Terry E. Engle, and Dale Woerner. Alltech, Inc.	53-61400	\$71,316
2011-2012	National Beef Quality Audit Phase II. Jeff Savell, Dan Hale, D. Griffin, Keith Belk, Dale Woerner, and J. Daryl Tatum. Texas A&M University and National Cattlemen's Beef Association.		\$8,000

2012-2013	Effects of Differences in Carcass Maturity on Eating Quality of Beef From Fed Steers and Heifers That Have Been Identified as Less Than 30 Months. J. Daryl Tatum, Dale Woerner, and Keith Belk. National Cattlemen’s Beef Association.	53-72040	\$74,245
2012	Modern Beef Production Seminar Entitled: Beef + Media Transparency = Trust. Travis Hoffman, Dale R. Woerner, and Keith Belk. Colorado Beef Council.	53-07890	\$35,000
2013	A Comparison of Beef Carcass Grade Standards and Application Among the U.S., Canada, Australia, and Uruguay. Keith E. Belk, Dale R. Woerner, and J. Daryl Tatum. U.S. Meat Export Federation.		\$35,613
2012-2013	Evaluation of Syngenta Test Corn for Finishing Cattle Performance. John Wagner, Terry Engle, Shawn Archibeque, and Dale R. Woerner. Syngenta.	53-15810	\$45,373
2010-2013	Elanco BoviBrom Validation. Elanco. Keith E. Belk and Dale R. Woerner.	53-60510	\$37,625
2012-2013	Collaborative Project with Texas A&M, University of Missouri, and Cal Poly. Retail Tenderness Surveillance – 2012. Jeff Savell, Dale R. Woerner, Carol Lorenzen, and Robert Delmore. National Cattlemen’s Beef Association.		\$80,000
2012-2013	Colorado Beef Quality Assurance Program. Colorado Beef Council. J. K. Ahola, D. R. Woerner, and K. E. Belk.	53-78008	\$30,000
2013	International Perception on U.S. Beef Safety: Bone-in Loin Cuts and Concern Over SRMs. Keith E. Belk, Dale R. Woerner, and Travis Hoffman. US Meat Export Federation.	53-79360	\$7,500
2013	National Beef Quality Audit-2011: Lost Opportunities (Fact Sheet). K. E. Belk, D. R. Woerner, D. L. Pendell, and D. VanOverbeck. National Cattlemen’s Beef Association.	53-78790	\$5,000

2013	International Perception on U.S. Beef Safety: Bone-in Loin Cuts and Concern Over SRMs. K. E. Belk and D. R. Woerner. U.S. Meat Export Federation.		\$7,500
2013	Producer Fact Sheet: Lost Opportunities Identified in the NBQA-2011. K. E. Belk, D. L. Pendell, D. L. VanOverbeck, and D. R. Woerner. National Cattlemen's Beef Association.		\$5,000
2013-2014	Return on Investment and Industry Implications of Implementation of Lamb Instrument Grading. Keith E. Belk, Dale R. Woerner, and Travis Hoffman. American Lamb Board.	53-91510	\$9,500
2013-2014	AFTEC 3000 Validation Project – Zoetis. Keith E. Belk, Dale R. Woerner, Xiang Yang, Robert J. Delmore, Brittney Scott, and I. Geornaras. Zoetis.	53-08317	\$147,260
2013-2014	Evaluation of Probiotics from Nova Microbial Technologies for Their Competitive Exclusionary Activities. Keith E. Belk, Dale R. Woerner, Hua Yang Zoetis.	53-08338	\$13,691
2013-2014	A Comparison of Beef Carcass Grade Standards and Application Among the U.S., Canada, Australia, and Uruguay. Keith E. Belk, Dale R. Woerner, and J. Daryl Tatum. U.S. Meat Export Federation.	53-15680	\$49,930
2013-2014	Use of Metagenomic High-throughput Sequencing Technology and Robust Bioinformatics to Assess the Microbiome. Keith E. Belk, Dale R. Woerner, Paul S. Morley, Noelle Noyes, Hua Yang, I. Geornaras. National Cattlemen's Beef Association.	53-79920	\$124,346
2014	Effects of Carcass Maturity on Beef Eating Quality. Joseph D Tatum, Dale Woerner. National Cattlemen's Beef Association.	53-00162	\$73,771

2014-2015	Preferences & Complaints Associated With American Lamb Quality In Retail & Foodservice Markets. Keith E. Belk, Dale R. Woerner, Travis Hoffman, Robert J. Delmore, Steve B. LeValley, Richard Kraig Peel, J. Daryl Tatum. American Lamb Board.	53-71001	\$150,000
2013-2015	Colorado Beef Quality Assurance Program. Keith E. Belk, Dale R. Woerner, Jason K. Ahola, Travis W. Hoffman. Colorado Beef Council.	53-89950	\$30,000
2013-2015	Evaluation of Four Packaging Systems on Retail Display Life of Striploin Steaks from Two Different Production Systems. Keith E. Belk, Dale R. Woerner, Santiago Luzardo, J. Daryl Tatum. Instituto Nacional de Investigacion Agropecuaria.	53-91840	\$136,442
2014-2016	Paradigm Shift: Revolutionizing Our Understanding Of Antimicrobial Resistance Ecology Through Whole Genome Analysis Of Microbial Communities. P. S. Morley, K. E. Belk, H. Yang, C. W. Booker, C. Boucher, M. Bunning, B. A. Burgess, R. J. Delmore, S. P. Gow, S. Hannon, K. L. Jones, T. A. McAllister, J. A. A. McArt, C. S. McConnel, N. R. Noyes, S. J. Reynolds, J. Ruiz, H. M. Scott, M. G. Thomas, D. C. Van Metre, N. L. Ward, and D. R. Woerner. USDA-NIFA.		\$2,249,609
2015-2017	National Beef Quality Audit - 2016 (Phase I: Face-to-Face Interviews); Keith Belk; Dale Woerner; Jennifer Nicole Martin; Joseph D Tatum; Robert J Delmore; NCBA-National Cattlemens Beef Association		\$63,530
2015-2016	Effects of Supplemental Zinc Dose and Source on Performance and Carcass Characteristics of Feedlot Steers; Terry E Engle; John J Wagner; Dale Woerner; Ashley Michelle Stokes		\$101,143

2015-2017	National Beef Quality Audit - 2016 (Phase II: In-plant Survey); Keith Belk; Dale Woerner; Jennifer Nicole Martin; Joseph D Tatum; Robert J Delmore; NCBA-National Cattlemens Beef Association		\$19,000
2015-2016	Mapping the Location of Pathogenic Bacteria in Rendered Used Cooking Oil Subject to Heat Treatment; Jennifer Nicole Martin; Woerner, D. R; Hua Yang; Ifigenia Geornaras ; Keith Belk; Robert J Delmore; Fats & Proteins Research Foundation, Inc		\$42,212
2015-2016	Colorado Beef Quality Assurance Program; Jason Kee Ahola; Dale Woerner; Keith Belk; Kevin Pond; Robert J Delmore; Colorado Beef Council		\$30,000
2015-2016	Titon Pork Carcass Spray Validation Proposal; Jennifer Nicole Martin; Woerner, D. R; Hua Yang; Ifigenia Geornaras ; Keith Belk; Kathryn Rose McCullough; Robert J Delmore; Zoetis		\$28,575
2015-2016	Effects of Cattle Feeding Location (Arizona vs. Texas) and use of Tylosin on Expression of Antimicrobial Resistance (AMR) and Liver Abscesses; Keith Belk; Dale Woerner; Robert J Delmore; Hua Yang; Christina Anne Boucher Paul S Morley; Ifigenia Geornaras ; Jennifer Nicole Martin; NCBA-National Cattlemens Beef Association		\$232,275
2015-2016	Proposal to Quantitatively Evaluate the Antimicrobial Food Safety Risks Associated with the use of Tylosin for Reduction of Liver Abcesses in Fed Cattle; Keith Belk; Dale Woerner; Robert J Delmore; Hua Yang; Christina Anne Boucher Paul S Morley; Ifigenia Geornaras ; Jennifer Nicole Martin; NCBA-National Cattlemens Beef Association		\$22,500

2015-2016	Validation of Various Antimicrobial Interventions for Use in a Bone Dust Cabinet in a Commercial Beef Harvest Facility; Jennifer Nicole Martin; Woerner, D. R; Hua Yang; Ifigenia Geornaras ; Keith Belk; Robert J Delmore; Corbion		\$26,211
2015-2016	Molybdenum Water Concentrations and Beef Cattle Performance; Terry E Engle ; John J Wagner; Shawn Archibeque; Dale Woerner; Martha Lynne Kesel; Karen S Sellins; Timothy N Holt; Jesse French; Climax Molybdenum Company		\$170,262
2016	JBS Fresh Product Retail Test: Top Sirloin Steaks; Robert J Delmore; Dale Woerner; Jennifer Nicole Martin; Keith Belk; JBS International		\$78,000
2016	Poultry Parts Decontamination - Electrostatic Antimicrobial Application: Phase 1; Belk,Keith; Davis,Haley; Delmore,Robert; Yang,Hua; Geornaras,Ifigenia; Martin,Jennifer; Woerner,Dale; Birko Corporation	5362018	\$30,651
2016-2017	The Use of a Yeast Fermentation Product or an Essential Oil as an Alternative to Tylosin in the Diets of Finishing Cattle; Martin,Jennifer; Boucher,Christina; Morley,Paul; Yang,Hua; Geornaras, Ifigenia; Belk,Keith; Delmore,Robert; Dale R. Woerner; National Cattlemen's Beef Association	5378066	\$200,000
2016-2017	Determining the Impact of Using Tylosin Alternatives in the Diet of Feedyard Cattle on Fecal Pathogen Populations, Liver Abscesses, and the Microflora; Martin,Jennifer; Yang,Hua; Woerner,Dale; Morley,Paul; Geornaras,Ifigenia; Delmore,Robert ; Belk,Keith; Abdo,Zaid; Five Rivers Ranch Cattle Feeding	5378089	\$123,000

2016-2017	Salmonella Contamination in Poultry-Are We Missing a Potential Vector?; Martin,Jennifer; Yang,Hua ; Geornaras,Ifigenia; Belk,Keith; Delmore,Robert; Woerner,Dale; North American Meat Institute	5362031	\$50,000
2017	Belk,Keith ; Woerner,Dale; Martin,Jennifer Nicole ; Geornaras,Ifigenia; Delmore,Robert J ; Davis,Haley Elizabeth; Validation of Electrostatic Antimicrobial Application In-Lab: Phase 2; Birko Corp.	5362057	\$68,816
2017-2019	Belk,Keith ; Yang,Hua ; Woerner,Dale ; Morley,Paul S; Metcalf,Jessica Lynne; Delmore,Robert J; AMR risk assessment data gaps: AMR in feces of culled market cows and bulls and retail meat and poultry products from animals raised with and without antibiotics. Foundation for Meat and Poultry Research and Education	5301366	\$110,000
2017-2019	Yang,Hua ; Woerner,Dale ; Morley,Paul S; Geornaras,Ifigenia; Belk,Keith; Expand the Capabilities of a CRISPR-Cas9 System for Sequence-Specific Elimination of Foodborne Pathogens in Beef Production; National Cattlemens Beef Association	5350034	\$36,209
2017	Belk, Keith and Woerner, Dale; Systematic review of the classification and consumption of meat in relation to human health; National Cattlemen's Beef Association	5315014	\$11,000
2017-2018	Sampling and Residue Testing of Tissues from Study FRR1708 Effects of Ractopamine Withdrawal in Yearling Steers; National Cattlemens Beef Association	5340406	\$178,436
2017-2018	Effect of antimicrobial treatment of beef cheek meat and tongues on pathogen survival/death and product flavor volatiles during refrigerated and frozen storage; Foundation for Meat and Poultry Research and Education	5375561	\$74,972

2017-2019	Belk,Keith ; Yang,Hua ; Woerner,Dale ; Wagner,John Joseph ; Prenni,Jessica E ; Geornaras,Ifigenia ; Engle,Terry E ; Delmore,Robert; U.S. Beef Industry Best Practices for the Chinese Market. Texas A and M University.	5375548	\$330,582
2018 - 2019	Predicting Beef Flavor Differing in Lipid Heat Denaturation and Maillard Reaction Products; Rhonda K. Miller, Chris Kerth, Jerrad Legako, Chance Brooks; National Cattlemen's Beef Association		\$64,550
2017-2022	Establishing an Alliance for Research and Innovation in the Rendering and Pet Food Industries; Martin,Jennifer; Woerner,Dale; Pond,Kevin; Fat and Proteins Research Foundation	5370006	\$85,800
2019	Evaluation of PorciBrom application on pork primals - Microbial growth and shelf life Study; Matthew W. Husman, Jackson L. McReynolds, Dale R. Woerner, Mark F. Miller, Alejandro Echeverry (PI); Passport Food Safety		\$10,160
2019-2020	Use of interventions for pork quality: Increasing storage life and safety of fresh head meat and tongues destined for export markets. Alejandro Echeverry (PI), Dale Woerner, Jerrad Legako, Mark Miller; Natioanal Pork Board		\$195,971
2019 - 2020	Evaluation of beef steaks in vacuum skin packaging for palatability; Jerrad Legako (PI), Dale Woerner, J. Chance Brooks. NCBA		\$67,940
2019 - 2021	Impact of the feedlot environment microbiome, soil properties and weather on Salmonella survival and persistence and evaluation of mitigation strategies to remediate Salmonella in soil; Kendra K. Nightengale, Dale Woerner, Lindsey Slaughter, Alejandro Echeverry, Angie Siemens, and Tyson Brown; NCBA		\$270,229

2019-2022	Quality & Food Safety Assessments of Cell Based Muscle Tissue. Marcos Sanchez and Dale Woerner		\$19,500
2020-2021	Efficacy of common antimicrobial interventions at and above regulatory allowable pick up levels. Jerrad F. Legako, Dale R. Woerner, J Chance Brooks, Kendra Nightingale, Marcos Sanchez, and Alejandro Echeverry.		87,328
Total Co-PI Funding:			\$7,303,042

Externally-Funded Projects as Investigator or role other than PI or CoPI:

Year	Project, Investigators, Sponsor	Amount
2009	Service/Outreach: Carcass Show and Ultrasound Evaluations Colorado County Fairs and State Fair. Various Fairs and Shows.	\$18,995
2009	Catering Functions: Fundraising for Meat Judging and Undergraduate Meat Science Activities. Various Sponsors.	\$67,989
2010	Service/Outreach: Carcass Show and Ultrasound Evaluations Colorado County Fairs and State Fair. Various Fairs and Shows.	\$19,795
2010	Catering Functions: Fundraising for Meat Judging and Undergraduate Meat Science Activities. Various Sponsors.	\$73,256
2010	Service: White Paper-Overview of the U.S. Beef Industry. Dale Woerner. JBS International.	\$5,000
2010	Service: Pathogen Spray Intervention Study. Keith Belk, Dale Woerner, and John Sofos. JBS International.	\$8,056
2010	Service: Export Webinars. Keith Belk and Dale Woerner. National Pork Board.	\$3,300
2010	Service: Export Cut Photo-shoot. Dale Woerner and Keith Belk. National Cattlemen’s Beef Association.	\$800
2010	Service: Beef Innovations Group Demonstration. Dale Woerner. National Cattlemen’s Beef Association.	\$2,200
2010	Service: Pathogen Spray Intervention Study. Keith Belk, Dale Woerner, and John Sofos. Hawkins Company, Inc.	\$2,400
2010	Service/Outreach: Colorado State CDE Meat Evaluation Contest. Dale Woerner, J. Daryl Tatum, and Keith Belk. Colorado FFA.	\$2,113
2010	Service: 4H and FFA Meat Evaluation Contest. Dale Woerner, J. Daryl Tatum, and Keith Belk. Western National Roundup.	\$5,960
2011	Donation: Elanco Animal Health Meat Science Graduate Student Support Fund. Dale Woerner, J. Daryl Tatum, and Keith Belk. Elanco Animal Health.	\$25,500
2011	Service/Outreach: Carcass Show and Ultrasound Evaluations Colorado County Fairs and State Fair. Various Fairs and Shows.	\$20,125

Year	Project, Investigators, Sponsor	Amount
2011	Catering Functions: Fundraising for Meat Judging and Undergraduate Meat Science Activities. Various Sponsors.	\$77,495
2011	Service: Export Shelf-life. Dale Woerner and Keith Belk. JBS USA, Beef Division.	\$5,000
2011	Service: Shear Force Testing. Dale Woerner, J. Daryl Tatum, and Keith Belk. JBS USA, Beef Division.	\$18,610
2011	Service: TBA Analysis. Dale Woerner and Keith Belk. CO Casualty Insurance.	\$575
2011	Service: Shear Force Testing. Dale Woerner, J. Daryl Tatum, and Keith Belk. Sylvandale Ranches.	\$750
2011	Service: Lamb carcass evaluation. Dale Woerner, J. Daryl Tatum, and Keith Belk. Missouri State Fair.	\$572
2011	Service: Lamb carcass evaluation. Dale Woerner, J. Daryl Tatum, and Keith Belk. Iowa State Fair.	\$1,495
2011	Service: Carcass Data Collection. Dale Woerner, J. Daryl Tatum, and Keith Belk. SECRC.	\$24,575
2011	Service: Shear Force Testing. Dale Woerner, J. Daryl Tatum, and Keith Belk. JBS Pilgrim's Pride.	\$1,500
2011	Service: Shear Force Testing. Dale Woerner, J. Daryl Tatum, and Keith Belk. Elanco Animal Health.	\$8,960
2011	Service/Outreach: Colorado State CDE Meat Evaluation Contest. Dale Woerner, J. Daryl Tatum, and Keith Belk. Colorado FFA.	\$2,309
2011	Service: Shear Force Testing-Nolan Ryan Project. Dale Woerner, J. Daryl Tatum, and Keith Belk. Elanco Animal Health.	\$21,121
2011	Service: Lamb Enhancement. Dale Woerner, J. Daryl Tatum, and Keith Belk. Mountain States Rosen.	\$5,340
2011	Service: Bovine Blood Collection. Dale Woerner, J. Daryl Tatum, and Keith Belk. Care Research Laboratories.	\$10,000
2011	Service: Bison Shear Force Testing. Dale Woerner, J. Daryl Tatum, and Keith Belk. National Western Stock Show.	\$220
2011	Service: 4H and FFA Meat Evaluation Contest. Dale Woerner, J. Daryl Tatum, and Keith Belk. Western National Roundup.	\$5,575
2012	Service: 4H and FFA Meat Evaluation Contest. Dale Woerner, J. Daryl Tatum, and Keith Belk. Western National Roundup.	\$6,295
2012	Donation: Elanco Animal Health Meat Science Graduate Student Support Fund. Dale Woerner, J. Daryl Tatum, and Keith Belk. Elanco Animal Health.	\$51,500
2012	Service: Shear Force Testing. Dale Woerner, J. Daryl Tatum, and Keith Belk. JBS USA, Beef Division.	\$91,925
2012	Service: Shelf Life and Shear Force Determination. Dale Woerner, J. Daryl Tatum, and Keith Belk. Elanco Animal Health.	\$4,505
2012	Service: Carcass Data Collection. Dale Woerner, J. Daryl Tatum, and Keith Belk. SECRC.	\$7,944

Year	Project, Investigators, Sponsor	Amount
2012	Service: Carcass Data Collection. Dale Woerner, J. Daryl Tatum, and Keith Belk. CSU Animal Science.	\$1,085
2012	Recording of Commonly Exported Pork Offal Items. Dale Woerner. U.S. Meat Export Federation.	\$5,625
2012	Service/Outreach: Colorado State CDE Meat Evaluation Contest. Dale Woerner, J. Daryl Tatum, and Keith Belk. Colorado FFA.	\$2,480
2012	Catering Functions: Fundraising for Meat Judging and Undergraduate Meat Science Activities. Various Sponsors.	\$74,943
2012	Service: Shear Force Determination. Dale Woerner, J. Daryl Tatum, and Keith Belk. SuKarne.	\$3,000
2012	Service: Shear Force Determination. Dale Woerner, J. Daryl Tatum, and Keith Belk. National Bison Association.	\$255
2012	Service/Outreach: Carcass Show and Ultrasound Evaluations Colorado County Fairs and State Fair. Various Fairs and Shows. D. R. Woerner.	\$20,130
2012	Service: Sensory and Shear Force Determination. Dale Woerner, J. Daryl Tatum, and Keith Belk. J.R. Simplot.	\$5,965
2013	Catering Functions: Fundraising for Meat Judging and Undergraduate Meat Science Activities. Various Sponsors.	\$116,162
2013	Service: Sensory and Shear Force Determination. Dale Woerner, J. Daryl Tatum, and Keith Belk. JBS Beef Division.	\$27,720
2013	Service: Sensory and Shear Force Determination. Dale Woerner, J. Daryl Tatum, and Keith Belk. Colorado Premium Foods.	\$3,080
2013	Service: Sensory and Shear Force Determination. Dale Woerner, J. Daryl Tatum, and Keith Belk. Elanco Animal Health.	\$8,420
2013	Service: Sensory and Shear Force Determination. Dale Woerner, J. Daryl Tatum, and Keith Belk. Harris Ranch Beef Company.	\$585
2013	Service: Food Safety Sample Preparation. Dale Woerner, J. Daryl Tatum, and Keith Belk. JBS Beef Division.	\$631
2013	Service: Fabrication of Beef Product. Dale Woerner, J. Daryl Tatum, and Keith Belk. NCBA Beef Innovations Group.	\$938
2013	Service: Sensory and Shear Force Determination. Dale Woerner, J. Daryl Tatum, and Keith Belk. Nolan Ryan Tender-Aged Beef.	\$1,637
2013	Service: Sensory and Shear Force Determination. Dale Woerner, J. Daryl Tatum, and Keith Belk. Sylvandale Ranch.	\$512
2013	Service: Slide presentation preparatoin. Dale Woerner, J. Daryl Tatum, and Keith Belk. US Dairy Export Council.	\$2,000
2013	Donation for assistance and support. K. E. Belk, D. R. Woerner, J. D. Tatum, and J. N. Sofos. Birko Corporation.	\$10,000
2013	Donation for assistance and support. K. E. Belk and D. R. Woerner. Where Food Comes From, Inc.	\$50,000
2013	Service: Oven usage time. D. R. Woerner and K. E. Belk. Colorado Premium Foods.	\$1,500

Year	Project, Investigators, Sponsor	Amount
2013	Service: Carcass and harvest floor data collection for CSU Nutrition Program.	\$2,908
2013	Service: Preparation of validation inoculum surrogates. K. E. Belk and D. R. Woerner. JBS USA, Beef Division.	\$1,181
2013	Service: Preparation of beef marketing materials. D. R. Woerner and K. E. Belk. JBS USA, Beef Division.	\$3,420
2013	Service: Collection of beef tenderness samples from retail for Texas A&M University Meat Science. D. R. Woerner and K. E. Belk.	\$9,000
2014	Service: Intervention system validation study at Brown Packing Company. K. E. Belk, D. R. Woerner, and R. J. Delmore.	\$6,000
2014	Service: Sensory and Shear Force Evaluation for Colorado Premium Foods. D. R. Woerner and K. E. Belk.	\$4,200
2014	Service: Brisket yield tests and smoker usage. Colorado Premium Foods. D. R. Woerner and K. E. Belk.	\$4,000
2014	Service: Slice shear force testing for David Carter. D. R. Woerner and K. E. Belk.	\$270
2014	Service: Slice shear force testing for Harris Ranch Beef Company. D. R. Woerner and K. E. Belk.	\$4,112
2014	Service: Residue testing for IMI Global. K. E. Belk and D. R. Woerner.	\$2,343
2014	Service: Conducting yield tests for JBS USA, Beef Division marketing team.	\$3,970
2014	Service: Fatty acid profiling on Holstein beef samples for JBS USA, Beef Division.	\$700
2014	Service: Slice shear force surveillance testing for JBS USA, Beef Division. D. R. Woerner and K. E. Belk.	\$23,750
2014	Service: Intervention system validation study for JBS USA, Beef Division.	\$7,940
2014	Service: Slice shear force determinations for National Bison Show, National Western Stock Show. D. R. Woerner and K. E. Belk.	\$671
2014	Service: Collection and creation of innovative forequarter fabrication cuts for NCBA Beef Innovations Group. D. R. Woerner and K. E. Belk.	\$900
2014	Service: Slice shear force determinations for Nolan Ryan Tender Aged Beef. D. R. Woerner and K. E. Belk.	\$3,230
2014	Service: Slice shear force determination for Deseret Land and Livestock. D. R. Woerner and K. E. Belk.	\$5,950
2014	Service: Shear force determinations and moisture loss tests for Tyson Fresh Meats, Beef Division. D. R. Woerner and K. E. Belk.	\$5,000
2014	Intervention systems validation for Zoetis. K. E. Belk, D. R. Woerner, and R. J. Delmore.	\$14,832

Year	Project, Investigators, Sponsor	Amount
2014	Catering Functions: Fundraising for Meat Judging and Undergraduate Meat Science Activities. Various Sponsors. D. R. Woerner.	\$114,430
2014	Service/Outreach: Carcass Show and Ultrasound Evaluations Colorado County Fairs and State Fair. Various Fairs and Shows. D. R. Woerner.	\$15,717
2015	Catering Functions: Fundraising for Meat Judging and Undergraduate Meat Science Activities. Various Sponsors. D. R. Woerner.	\$162,468
2015	National Bison Show: Jim Matheson	\$571
2015	JBS: Ground Beef: Alex Tyre	\$9,650
2015	NCBA Cattlemen's College: John Paterson & Grace Webb	\$9,854
2015	Turner Enterprises, Inc.: John Hansen	\$3,745
2015	CSU Nutrition Group-John Wagner	\$2,541
2015	Western National Roundup: Melissa Barton	\$5,825
2015	CSU All Heifer, no cow project: Ahola, Archibeque, Peel, Siedel	\$1,849
2015	JBS: Pork Division: Tyler Hodgson	\$150
2015	Colorado FFA: Melanie Calderwood, Kellie Enns	\$1,255
2015	Pilgrim's Pride: Srinath Chamarthu and Drew DeCanga	\$3,150
2015	NCBA : Bridget Wasser cutout calculator update	\$2,588
2015	Pilgrim's Pride: Cooking validations 07/2015	\$2,400
2015	NCBA Beef Innovations: Ultrasounds: B. Wasser and S. Wald	\$3,292
2015	Neogen Corporation: John Heller Tissue Collections	\$3,000
2015	Zoetis: Beef University: Bo Reagan	\$14,912
2015	Chicken Breast Sensory: Srinath Chamarthu	\$3,500
2015	JBS Validation Study Tolleson: Sherri Jenkins	\$25,203

Year	Project, Investigators, Sponsor	Amount
2015	JBS North American Beef Division: Megan Gifford	\$13,650
2015	JBS North American Beef Division: Alex Tyre, BBFT caselife trial	\$22,045
2015	JBS North American Beef Division: Alex Tyre, pork blend caselife trial	\$11,480
2015	National Pork Board: Tucson travel: Becca Hendricks	\$2,268
2015	Hawaii Cattlemen's Council: Dr. Lisa Wood	\$1,981
2015	US Meat Export Federation: Cheyenne McEndaffer, white paper	\$3,000
2015	CSU Animal Nutrition Group: Dr. Terry Engle: carcass data collection	\$800
2016	Catering Functions: Fundraising for Meat Judging and Undergraduate Meat Science Activities. Various Sponsors. D. R. Woerner.	\$188,360
2016	National Western Bison Show: Jim Matheson	\$902
2016	Pilgrim's Pride: Chicken Breast Sensory Project, Srinath Chamarthy	\$3,000
2016	Western National Roundup: Melissa Barton	\$5,680
2016	Cargill Meat Solutions: Scott Howard, Dodge City Color Study	\$12,252
2016	Cargill Meat Solutions: Scott Howard, Fort Morgan Cutout	\$10,000
2016	Nova Microbial Technologies, LLC: Rick Goodall, Dr. Hua Yang	\$1,620
2016	Diamond V: travel reimbursement	\$1,850
2016	BIFSCo travel reimbursement NCBA: Dani Shubert	\$2,374
2016	Pilgrim's Pride: Sri Chamarthy, Air vs. Water Chill	\$4,500
2016	Tyson Fresh Meats-Beef Division: David Mckenna: Beef cutout trial	\$45,700
2016	Deseret Cattle: David Secrist and Michael Archibald: 2016 tenderness	\$6,575
2016	National Pork Board: Becca Nepple, Fibrin Video	\$19,670
2016	Merck Animal Health: Mark Corrigan	\$2,207

Year	Project, Investigators, Sponsor	Amount
2016	Zoetis: Bo Reagan Beef University	\$17,404
2016	US Meat Export Federation: Lindsay Cammel, Columbia Fibrin Workshop	\$2,712
2016	Taste of Hawaiian Range: Jeri Moniz travel reimbursement	\$1,594
2016	Upper Midwest Gate To Plate: Jeff Held	\$1,192
2016	JBS USA: Mike Lesiak/Jose Gardner cooking val.	\$5,750
2016	Missouri State Fair: Greg Onstott tag transfer	\$525
2016	Tyson Fresh Meats: Dave McKenna & Rebecca Acheson, chairman's reserve pork	\$5,688
2016	CO Association of Meat Processors: Mark Otteman CAMP	\$7,000
2016	CSU Animal Science: Welfar Group, Miriam Martin, Head Sample prep	\$160
2016	Agri Beef: Justin Homm, Waygu/Akaushi	\$3,900
2016	Texas Next: Steve Hassmann	\$1,879
2017	Catering Functions: Fundraising for Meat Judging and Undergraduate Meat Science Activities. Various Sponsors. D. R. Woerner.	\$221,911
2017	National Western Bison Show: Jim Matheson	\$719
2017	NAMI-IPPE: Nicole Vetsch & Ann Wells (travel and product reimbursement)	\$1,902
2017	Colorado Farm Show: Ryan Rhodes steak demo	\$450
2017	Western National RoundUp: Melissa Barton meat judging contest	\$5,900
2017	Elanco Animal Health: Don Anderson	\$700
2017	SD Post Weaning Lamb Performance: David Ollila	\$2,002
2017	NCBA: Beef Safety Research, Belk	\$2,000
2017	Zinpro: steak demo	\$700
2017	Elanco: John Scanga	\$7,500

Year	Project, Investigators, Sponsor	Amount
2017	Let it Grow Project: Mountain States Rosen, Brad Anderson	\$6,600
2017	CSU Nutrition Group: Shawn Archibeque carcass data	\$3,200
2017	Tyson Fresh Meats: Rebecca Acheson	\$22,090
2017	FSNS: service lab work with Morley	\$3,000
2017	Colorado FFA CDE's 2017 Meat Evaluation CDE: Kellie Enns and Keaton Ochsner	\$11,795
2017	NCBA: Bridget Wasser, beef cut images	\$1,700
2017	Zoetis: Bo Reagan Surfactant Study	\$11,500
2017	JBS Service Work	\$1,760
2017	Zoetis: Bo Reagan, Organic Acid Study Phase I	\$9,125
2017	53-62057: Birko Electrostatic sample preps	\$21,350
2017	Harris Ranch Beef Company: Curtis Pittman, HRBC Validation	\$8,500
2017	Passport Food Safety Solutions: Dr. John Ruby, passport validation	\$15,860
2018	Colorado Fair Ultrasound Evaluations	\$19,651
2018	CSU Meat Judging Program Catering Income	\$217,594
2019	JBS Grass Fed Brand Comparison	\$15,000
2019	JBS Aspen Ridge Brand Comparison	\$9,000
2019	Sunfed Beef Baseline Test	\$7,800
	Total Service, Fundraising, and Donations:	\$2,465,925

Internally-Funded Awards:

Year	Project, Investigators, Sponsor	Amount
2010	Development of a Specialized Custom Meat and Produce Sprayer. Dale Woerner and John Sofos. Infectious Disease SuperCluster.	\$3,000
	Total Internal Funding	\$3,000

OTHER PROFESSIONAL SERVICE

Committees

Colorado State University Committee, year(s)

- Center for Meat Safety and Quality Center Member; 2009 – 2018
- Colorado State University Ag Advisory Committee Member; 2014 – 2018
- Microbial Ecology Group Member; 2015 - 2018

Colorado State University, College of Ag Sciences Committee, year(s)

- Search Committee Member: College of Ag Sciences Grant Facilitator Position - 2015
- Search Committee Member: Director of Communications, College of Agricultural Sciences, Colorado State University - 2013
- College of Agricultural Sciences Dean's Faculty Advisory Committee; Department of Animal Sciences Representative – 2009 – 2013
- College of Agricultural Sciences Sustainable Agriculture Degree/Major Advisory Working Committee - 2012
- College of Agricultural Sciences Strategic Initiatives Committee; Member, Department of Animal Sciences Representative – 2009
- College of Agricultural Sciences Y-Cross Endowment Committee; 2016 - 2018

Colorado State University Department of Animal Sciences Committee, year(s)

- Department of Animal Sciences Curriculum Committee Member – 2011 – 2018
- Gary & Kay Smith Global Food Innovation Center Internal Funding Committee (2013-2018).
- Department of Animal Sciences Meat Judging Team Faculty Advisor – 2009 – 2018
- Department of Animal Sciences Meat Science Academic Quiz Bowl Team Advisor – 2009 – 2018
- Department of Animal Sciences Next Century Judging Team Endowment Committee Member – 2009 – 2018
- Department of Animal Sciences Meat Sensory Laboratory and Kitchen Facility Manager – 2009 - 2018
- Search Committee Member: Beef/Dairy Systems Management Faculty Position - 2014
- Search Committee Member: Meat Laboratory Manager Position - 2014
- Department of Animal Sciences Curriculum Review Committee – 2013
- Member: Search Committee Meat Science Faculty Position - 2013
- Department of Animal Sciences Curriculum Review Committee, Concentrations Working Group – 2013
- Member: Search Committee Beef Systems Faculty Position - 2016
- Member: Search Committee Livestock Judging Coach Position - 2016
- Member: Search Committee Meat Science Faculty Position - 2016
- Member: Search Committee Instructor/Recruiter Position – 2016
- Department of Animal Sciences Graduate Student Committee Member – 2018 - 2018
- Department of Animal Sciences Scholarship Committee Member – 2012 - 2018

Other activities and outreach while at Colorado State University

Special service to the state/community related to professional expertise

In my tenure as a faculty member, I made a commitment to providing outreach opportunities and service to the constituents in the state of Colorado and to industry partners worldwide.

During my time as a faculty member, I had the responsibility of coordinating the obligations of the university related to meat science with the youth organizations in the state of Colorado.

These organizations include Colorado 4-H, Colorado FFA, Colorado Jr. Pork Producers, Colorado Jr. Angus Association, many Colorado and surrounding state county fairs, the Colorado State Fair, National Western Stock Show and more. These duties included organizing youth judging contests, judging workshops, meat quality assurance workshops, informative demonstrations and lectures, consultation to county agents and county fair officials, and providing carcass show officials for junior livestock shows and fairs. Under my supervision, our team has hosted over 40 meat judging contests involving over 1,500 youth participants, and we performed more than 20,000 individual carcass evaluations at over 100 Colorado and surrounding state county fairs. Additionally, we performed more than 80 educational programs at these county fairs to compliment the carcass evaluations, and improve the understanding an importance of meat quality.

In addition to being committed to the youth, in my tenure as a faculty member, I provided over 220 presentations, demonstrations, and/or workshops to groups outside of the university including many of the state's livestock groups and the nation's leading livestock associations. These efforts also include seminars and tours to numerous international groups visiting CSU with question about U.S. livestock and meat production, as well as many international trips to South and Central America, South Africa, and Southeast Asia to provide seminars and demonstrations to customers and potential customers of U.S. meat products. In some instances, these seminars have been instrumental in influencing and changing foreign policies and taking down barriers for international trade access, and most all of them have resulted in an improved understanding of and confidence in U.S. livestock production systems and have improved trade and market relationships. Additionally, I have served as the technical advisor and the Colorado State University contact for the Colorado Association of Meat Processors, which represent over 150 small, locally owned meat processing businesses in the state of Colorado. This associations joins its sister organization in Wyoming each year to hold a 3-day, Colorado and Wyoming meat processor's convention, and every other year I organize the meeting in Fort Collins in the University Meat laboratory.

CONSULTING ACTIVITIES

I routinely provide consultation to the following entities:

- Cargill Protein, Wichita, KS
- Delta Airlines, Atlanta, GA
- Leachman Cattle of Colorado, Wellington, CO
- Hawaiian Cattlemen's Association, Honolulu, HI
- Producers Feedlot, Greeley, CO
- U.S. Meat Export Federation, Denver, CO
- North American Meat Institute, Washington, D.C.
- National Cattlemen's Beef Association, Beef Innovations Group, Centennial, CO

- JBS, USA Beef and Pork Divisions, Greeley, CO
- American Lamb Board, Denver, CO
- Mountain States Rosen, Bronx, NY
- Superior Lamb, Dixon, CA
- Pilgrim's Pride, Greeley, CO
- Colorado Premium Foods, Greeley, CO
- AgriBeef, Boise, Idaho
- Colorado State University Extension, Fort Collins, CO
- Colorado Association of Meat Processors, Fowler, CO