CURRICULUM VITAE

Kristin Hales, Ph.D., PAS
Thornton Distinguished Chair
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Texas Tech University
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EDUCATION

2004 Bachelor of Science in Animal Science, Oklahoma State University, Stillwater
2006 Master of Science in Animal Science, Oklahoma State University, Stillwater
2009 Doctor of Philosophy in Animal Science, Texas Tech University, Lubbock

PROFESSIONAL EXPERIENCE

2004-2006	Graduate Research Assistant, Oklahoma State University
2007-2009	Graduate Research/Teaching Assistant, Texas Tech University
2009-2011	Research Animal Scientist (Post Doc), GS-11 USDA, ARS, Conservation and Production Research Laboratory, Bushland, TX
2011-2014	Research Animal Scientist, GS-12 USDA, ARS, U.S. Meat Animal Research Center, Clay Center, NE
2014-2018	Research Animal Scientist, GS-13 USDA, ARS, U.S. Meat Animal Research Center, Clay Center, NE
2018-2019	Research Animal Scientist, GS-14 USDA, ARS, U.S. Meat Animal Research Center, Clay Center, NE
2019-present	Thornton Distinguished Chair, Associate Professor, Texas Tech University
2023-present	Thornton Distinguished Chair, Professor, Texas Tech University

MEMBERSHIP IN PROFESSIONAL AND HONORARY SOCIETIES

Professional:

1. American Society of Animal Science; 2004-present
2. Plains Nutrition Council; 2004-present
3. American Registry of Professional Animal Scientists; 2009-present
4. National Cattlemen's Beef Association Member, 2009-present
5. Midwest Section of the American Society of Animal Science; 2011-present
6. Texas Cattle Feeders Association; 2019-present

HONORS AND AWARDS

Honors:

1. Top 10 Reviewer for the *Journal of Animal Science*, 2015
2. Top 10 Reviewer for the *Journal of Animal Science*, 2016
3. Top peer-review publisher for the U.S. Meat Animal Research Center, 2016
4. Manuscript featured as High Impact Articles Edition of Foodborne Pathogens and Disease, 2017, 2018, 2022
5. Top 10 Reviewer for the *Journal of Animal Science*, 2017
6. Top peer-review publisher for the U.S. Meat Animal Research Center, 2017
7. Top peer-review publisher for the U.S. Meat Animal Research Center, 2018

Awards:

1. Plains Nutrition Council Poster Award, 4th place, 2005
2. Joe Whiteman Oral Presentation, 2nd place, Oklahoma State University, 2006
3. Texas Cattle Feeder's Association Scholarship; 2007, 2008, and 2009
4. Bob Albin Graduate Student Research Award, 2nd place, Texas Tech University, 2009
5. Outstanding Alumni Spotlight, Northeastern Oklahoma A&M College, 2018
6. Outstanding Early Career Research Award, Midwest Section of the American Society of Animal Science, 2019
7. Barnie E. Rushing Distinguished Jr. Faculty STEM Research Award, Texas Tech University, 2022
8. Davis College Research Award, Texas Tech University, Davis College of Agriculture and Natural Resources, 2023
9. Graduate of Distinction Advanced Degree Award from Oklahoma State University, Department of Animal Science, 2024.
10. American Society of Animal Science, American Feed Industry Association, Ruminant Nutrition Award, 2024.

Awards Received by Undergraduate and Graduate Students Mentored:

1. 2nd Place, Bob Albin Graduate Student Research Award Texas Tech University, M.S. Division, received by Nate Long, 2022.
2. Runner Up Poster, Plains Nutrition Council, received by Taylor Smock, 2022.
3. 3rd Place, Bob Albin Graduate Student Research Award Texas Tech University, Ph.D. Division, received by Zach McDaniel, 2023.
4. Runner Up Poster, Plains Nutrition Council, received by Zach McDaniel, 2023.
5. 2nd Place, Bob Albin Graduate Student Research Award Texas Tech University, Ph.D. Division, received by Colten Dornbach, 2023.
6. 1st Place, Bob Albin Undergraduate Student Research Award Texas Tech University, received by Macy Lawrence, 2024.
7. 3rd Place, Bob Albin Graduate Student Research Award Texas Tech University, M.S. Division, received by Kallie Childress, 2024.
8. 1st Place, Bob Albin Graduate Student Research Award Texas Tech University, Ph.D. Division, received by Colten Dornbach, 2024.
9. Outstanding Undergraduate Researcher of the Year in Natural Science Davis College of Agricultural Science and Natural Resources, received by Macy Lawrence, 2024.

AREA OF EXPERTISE

RESEARCH AND TEACHING INTERESTS

Beef cattle nutrition and management, energetics, meat quality, microbiology, pathogen shedding, antimicrobial resistance, decreasing antimicrobial use in livestock production, gastrointestinal microbiome, liver abscess prevention in beef cattle, livestock systems, and beef production sustainability.

PUBLICATIONS

Google Scholar Statistics (10/3/2024)

Citations	**2,336**
h-index	**28**
i10-index	**53**

Book Chapters: Total of 3; 3 since hire date.

1. The use of cereal grains in improving feed efficiency and reducing by-products such as methane. In *Rumen Function*. Burleigh Dodds Science Publishing. Cambridge, UK. Editors: Dr. Chris McSweeney and Dr. Rod Mackie.
2. Liver abnormalities in cattle. In *Veterinary Clinics of North America: Food Animal Practice*. Editors: Dr. John Richeson and Dr. Ty Lawrence.
3. The future of beef production. In *Modern Beef Production: Integrative Approaches with Nutrition, Reproduction, and Genetics*. Pan Stanford Publishing. Editors: Dr. Ky Pohler and Dr. Phil Myer.

Refereed Journal Articles: Total of 111; 53 since hire date.

Italics denotes graduate student, post-doc, or visiting scientist mentored.

1. **Hales, K. E.**, E. M. Whitley, G. W. Horn, M. D. Childs, and C. S. Goad. Soybean hull supplementation for growing beef cattle in winter rye pasture production programs. Prof. Anim. Sci. 23:381-389. 2007.
2. Vasconcelos, J. T., R. J. Rathmann, R. R. Reuter, J. Leibovich, J. P. McMeniman, **K. E. Hales**, T. L. Covey, M. F. Miller, W. T. Nichols, and M. L. Galyean. Effects of duration of zilpaterol hydrochloride feeding and days on the finishing diets on feedlot cattle performance and carcass traits. J. Anim. Sci. 86:2005-2015. 2008.
3. Quinn, M. J., M. L. May, **K. E. Hales**, N. DiLorenzo, J. Leibovich, D. R. Smith, and M. L. Galyean. Effects of ionophores and antibiotics on in vitro hydrogen sulfide production, dry matter disappearance, and total gas production in cultures with a steam-flaked corn-based substrate with or without added sulfur. J. Anim. Sci. 87:1705-1713. 2009.
4. May, M. L., J. C. DeClerck, J. Leibovich, M. J. Quinn, N. DiLorenzo, D. R. Smith, K**. E. Hales**, and M. L. Galyean. Corn or sorghum wet distillers grains with solubles in combination with steam-flaked corn: In vitro fermentation and hydrogen sulfide production. J. Anim. Sci. 88:2425-2432. 2009.
5. May, M. L., M. J. Quinn, N. DiLorenzo, D. R. Smith, **K. E. Hales**, D. D. Simms, and M. L. Galyean. Effects of adding MIN-AD to steam-flaked corn-based diets with or without

wet corn distillers grain plus solubles on performance by beef cattle during receiving and finishing phases. Prof Anim. Sci. 25:559-568. 2009.

6. Parr, S. L., K. Y. Chung, M. L. Galyean, J. P. Hutcheson, N. DiLorenzo, **K. E. Hales**, M. L. May, M. J. Quinn, D. R. Smith, and B. J. Johnson. Performance of finishing beef steers in response to anabolic implant and zilpaterol hydrochloride supplementation. J. Anim. Sci. 89:560-570. 2010.
7. **Hales, K. E.**, J. P. McMeniman, J. Leibovich, J. T. Vasconcelos, M. J. Quinn, M. L. May, N. DiLorenzo, D. R. Smith, and M. L. Galyean. Effects of varying bulk densities of steam-flaked corn and dietary roughage concentration on in vitro fermentation, performance, carcass quality, and acid-base balance measurements in finishing steers. J. Anim. Sci. 88:1135-1147. 2010.
8. May, M. L., J. C. DeClerck, M. J. Quinn, N. DiLorenzo, J. Leibovich, D. R. Smith, **K. E. Hales**, and M. L. Galyean. Corn or sorghum wet distillers grains with solubles in combination with steam-flaked corn: Feedlot cattle performance, carcass characteristics, and apparent total tract digestibility. J. Anim. Sci. 88:2433-2443. 2010.
9. **Hales, K. E.**, N. A. Cole, M. L. Galyean, and A. B. Leytem. Nutrient concentrations and proportions in particle size fractions of corn steam-flaked to different bulk densities. Prof. Anim. Sci. 26:511-519. 2010.
10. **Hales, K. E.**, N. A. Cole, J. C. MacDonald. Effects of corn processing method and dietary inclusion of wet distillers grains with solubles on energy metabolism, carbon-nitrogen balance, and methane emissions of cattle. J. Anim. Sci. 90:3174-3185. 2012.
11. **Hales, K. E.**, N. A. Cole, V. H. Varel. Effects of corn processing method and dietary inclusion of corn wet distillers grains with solubles on odor and gas production in cattle manure. J. Anim. Sci. 90:3988-4000. 2012.
12. **Hales, K. E.**, D. B. Parker, N. A. Cole. Potential odorous volatile organic compound emissions from feces and urine from cattle fed corn-based diets with wet distillers grains and solubles. Atmos. Envr. 60:292-297. 2012.
13. Parker, D. B., L. Cai, H. K. Kim, **K. E. Hales**, M. J. Spiehs, B. Woodbury. Reducing odorous volatile organic compound emissions from swine manure using soybean peroxidase and peroxides. Biores. Tech. 124:95-104. 2012.
14. **Hales, K. E.**, N. A. Cole, J. C. MacDonald. Effects of increasing concentrations of wet distillers grains with solubles in steam-flaked, corn-based diets on energy metabolism, carbon-nitrogen balance, and methane emissions of cattle. J. Anim. Sci. 91:819-828. 2013.
15. **Hales, K. E**., H. C. Freetly, S. S. Shackelford, D. A. King. Effects of roughage concentration in dry-rolled corn-based diets containing wet distillers grains with solubles on performance and carcass characteristics of finishing beef steers. J. Anim. Sci. 91:3315-3321. 2013.
16. **Hales, K. E.**, R. G. Bondurant, M. K. Luebbe, N. A. Cole, J. C. MacDonald. Effects of crude glycerin in steam-flaked corn-based diets fed to growing feedlot cattle. J. Anim. Sci. 91:3875-3880. 2013.
17. **Hales, K. E.**, K. J. Kraich, R. G. Bondurant, B. E. Meyer, M. K. Luebbe, M. S. Brown, N. A. Cole, J. C. MacDonald. Effects of glycerin on receiving performance and health status of beef steers and nutrient digestibility and rumen fermentation characteristics of growing steers. J. Anim. Sci. 91:4277-4289. 2013.

18. **Hales, K. E.**, T. M. Brown-Brandl, and H. C. Freetly. Effects of decreased dietary roughage concentration on energy metabolism and nutrient balance in finishing beef cattle. J. Anim. Sci. 92:264-271. 2014.
19. **Hales, K. E.**, S. D. Shackelford, J. E. Wells, D. A. King, M. D. Hayes, T. M. Brown-Brandl, L.A. Kuehn, H. C. Freetly, and T. L. Wheeler. 2014. Effects of feeding dry-rolled corn-based diets with and without wet distillers grains and solubles and zilpaterol hydrochloride on performance, carcass characteristics, and heat stress in finishing beef steers. J. Anim. Sci. 92:4023-4033. 2014.
20. Foote, A. P., **K. E. Hales**, C. A. Lents, and H. C. Freetly. Association of circulating active ghrelin and total ghrelin concentrations with dry matter intake, growth, and carcass characteristics of finishing beef cattle. J. Anim. Sci. 92:5651-5658. 2014.
21. **Hales, K. E.**, D. B. Parker, and N. A. Cole. Volatile organic compound flux from manure of cattle fed diets differing in grain processing method and co-product inclusion. Atm. Env. 100:20-24. 2015.
22. Foote, A. P., **K. E. Hales**, and H. C. Freetly. Changes in acyl and total ghrelin concentrations and their association with dry matter intake; average daily gain, and feed efficiency of finishing beef steers and heifers. Domest. Anim. Endocrinol. 57:100-107. 2016.
23. **Hales, K. E.**, A. P. Foote, T. M. Brown-Brandl, and H. C. Freetly. Effects of dietary glycerin inclusion at 0, 5, 10, and 15 percent of dry matter on energy metabolism and nutrient balance in finishing beef steers. J. Anim. Sci. 93:348-356. 2015.
24. Freetly, H. C., A. K. Lindholm-Perry, **K. E. Hales**, T. M. Brandl-Brown, M. Kim, P. R. Myer, and J. E. Wells. Methane production and methanogen levels for steers that differ in residual gain. J. Anim. Sci. 93:2375-2381. 2015.
25. E. K. Buttrey, M. K. Luebbe, F. T. McCollum III, N. A. Cole, J. C. MacDonald, and **K. E. Hales**. Effects of glycerin concentration on performance and carcass characteristics of finishing steers consuming steam-flaked corn-based diets with supplemental yellow grease. J. Anim. Sci. 93:3698-3703. 2015.
26. Shackelford, S. D., D. A. King, **K. E. Hales**, and T. L. Wheeler. Effect of ractopamine hydrochloride and zilpaterol hydrochloride on tenderness of *Longissimus* steaks of *Bos taurus* steers. Meat Sci. 101:135-138. 2015.
27. Foote, A. P., **K. E. Hales**, L. A. Kuehn, D. H. Keisler, D. A. King, S. D. Shackelford, T. L. Wheeler, and H. C. Freetly. Relationship of leptin concentrations with feed intake, growth, and efficiency in finishing beef steers. J. Anim. Sci. 93:4401-4407. 2015.
28. **Hales, K. E.,** J. P. Jaderborg, G. I. Crawford, A. DiCostanzo, M. J. Spiehs, T. M. Brown-Brandl, and H. C. Freetly. Effects of dry-rolled or high-moisture corn with 25 or 45% wet distillers grains with solubles on energy metabolism and nutrient and macromineral balance in finishing beef steers. J. Anim. Sci. 43:4995-5005. 2015.
29. Foote, A. P., **K. E. Hales**, R. G. Tait Jr., E. D. Berry, C. A. Lents, J. E. Wells, and H. C. Freetly. Relationship of stress and hematological measures with feed intake, growth, and efficiency of finishing beef cattle. J. Anim. Sci. 94:275-283. 2016.
30. *Boyd, B. M.*, S. D. Shackelford, **K. E. Hales**, T. M. Brown-Brandl, M. L. Bremer, M. L. Spangler, T. L. Wheeler, D. A. King, and G. E. Erickson. Effects of shade and feeding zilpaterol hydrochloride to finishing steers on performance, carcass quality, heat stress, mobility, and body temperature. J. Anim. Sci .93:5801-5811. 2016.

31. Spiehs, M. J, **K. E. Hales**, B. L. Woodbury. Use of zilpaterol hydrochloride to reduce odor and gas production from the feedlot surfaces when beef cattle are fed diets with and without ethanol byproducts. Am. Soc. Ag. And Biol. Eng. 1:42-48. 2016.
32. Foote, A. P., R. G. Tait, Jr., D. H. Keisler, **K. E. Hales**, and H. C. Freetly. Changes in leptin concentrations and their association with DMI, ADG, and feed efficiency of finishing beef steers and heifers. Domestic Anim. Endo. 55:136-141. 2016.
33. Lindholm-Perry, A. K., A. R. Butler, R. J. Kern, R. Hill, L. A. Kuehn, J. E. Wells, W. T. Oliver, **K. E. Hales**, A. P. Foote, H. C. Freetly. Differential gene expression in the duodenum, jejunum, and ileum among crossbred beef steers with divergent gain and feed intake phenotypes. Anim. Genet. 47:408-427. 2016.
34. **Hales, K. E**., A. P. Foote, S. A. Jones, S. D. Shackelford, B. M. Boyd, and G. E. Erickson. The effects of zilpaterol hydrochloride and shade on blood metabolites and lung score of finishing beef steers. J. Anim. Sci. 94:2937-2941. 2016.
35. **Hales, K. E.**, S. D. Shackelford, J. E. Wells, D. A. King, N. A. Pyatt, and H. C. Freetly. The effects of feeding different protein concentrations with and without ractopamine hydrochloride on performance and carcass characteristics of finishing beef steers. J. Anim. Sci. 94:2097-2102. 2016.
36. **Hales, K. E**., A. P. Foote, S. A. Jones, S. D. Shackelford, B. M. Boyd, and G. E. Erickson. The effects of zilpaterol hydrochloride and shade on blood metabolites and lung score of finishing beef steers. J. Anim. Sci. 94:2527-2531. 2016.
37. *Artegoitia, V. M.*, A. P. Foote, R. M. Lewis, **K. E. Hales**, D. A. King, S. D. Shackelford, T. L. Wheeler, and H. C. Freetly. 2016. Endocannabinoids concentrations in plasma associated with feed efficiency and carcass composition of beef steers. J. Anim. Sci. 94:5177–5181. 2016.
38. **Hales, K. E.**, A. P. Foote, T. M. Brown-Brandl, and H. C. Freetly. The effects of feeding increasing concentrations of corn oil on energy metabolism and nutrient balance in finishing beef steers. J. Anim. Sci. 95:939–948. 2017.
39. **Hales, K. E.**, and N. A. Cole. Hourly methane production in finishing steers fed at different intake levels. J. Anim. Sci. 95:2089-2096 . 2017.
40. *Ratallick, K. J.*, J. M. Bormann, R. L. Weaber, M. D. MacNeil, H. L. Bradford, H. C. Freetly, **K. E. Hales**, D. W. Moser, W. M. Snelling, R. M. Thallman, and L. A. Kuehn. Genetic variance and covariance components for feed intake, average daily gain, and postweaning gain to improve feed efficiency in growing cattle. J. Anim. Sci. 95:1444-1450. 2017.
41. E. D. Berry, J. E. Wells, V. H. Varel, **K. E. Hales**, and N. Kalchayanand. 2016. Persistence of *Escherichia coli* and *E. coli* O157:H7 in feces and feedlot surface manure from cattle fed diets with or without corn or sorghum wet distillers grains with solubles. J. Anim. Sci. 95:3738-3744. 2017.
42. **Hales, K. E.**, A. P. Foote, D. B. Brake, T. M. Brown-Brandl, V. Artegoitia, and H. C. Freetly. Effects of zilpaterol hydrochloride on total body oxygen consumption and blood metabolites in finishing beef steers. J. Anim. Sci. 95:3192-3197. 2017.
43. **Hales, K. E**., J. E. Wells, E. D. Berry, N. Kalchayanand, J. L. Bono, and M. Kim. The effects of reducing antimicrobials in diets fed to finishing beef steers and heifers on growth performance and fecal shedding of *Escherichia coli* 0157:H7. J. Anim. Sci. 95:3738-3744. 2017.

44. Tedeschi, L. O., M. L. Galyean, and **K. E. Hales**. Recent advances in estimating protein and energy requirements of ruminants. J. Anim. Prod. 57:2237-2249. 2017.
45. Wells, J. E. E. D. Berry, M. Kim, S. D. Shackelford, and **K. E. Hales**. Evaluation of commercial β-agonists, dietary protein, and shade on fecal shedding of *Escherichia coli* O157:H7 from feedlot cattle. Foodborne Pathog. and Dis. 11:649-654. 2017.
46. *J. L. Cox-O'Neill*, **K. E. Hales**, K. M. Ulmer, R. J. Rasby, S. D. Shackelford, H. C. Freetly, and M. E. Drewnoski. The effects of backgrounding system on growing and finishing performance, and carcass characteristics of beef steers. J. Anim. Sci. 95:5309-5319. 2017.
47. Cunningham, H. C., K. M. Cammack, **K. E. Hales**, and H. C. Freetly. Microarray analysis of subcutaneous adipose tissue from mature cows with divergent body weight gain after feed restriction and realimentation. Data in Brief. 16:303-311. 2018
48. Thallman, R. M., L. A. Kuehn, W. M. Snelling, K. J. Retallick, J. M. Bormann, H. C. Freetly, **K. E. Hales**, G. L. Bennett, R. L. Weaber, D. W. Moser, and M. D. MacNeil. Reducing the period of data collection for intake and gain to improve response to selection for feed efficiency in beef cattle. J. Anim. Sci. 96:854-866. 2018.
49. Cole, N. A., D. B. Parker, R. W. Todd, A. B. Leytem, R. S. Dungan, **K. E. Hales**, S. L. Ivey, and J. Jennings. Use of new technologies to evaluate the environmental footprint of feedlot systems. Trans. Anim. Sci. 2:89-100. 2018.
50. *Melchior, E. A*., **K. E. Hales**, A. K. Lindholm-Perry, H. C. Freetly, J. E. Wells, C. N. Hemphill, T. A. Wickersham, J. E. Sawyer, and P. R. Myer. The effects of feeding monensin on rumen microbial communities and methanogenesis in bred heifers fed in a drylot. Livst. Sci. 212:131-136. 2018.
51. *C. N. Hemphill*, T. A. Wickersham, J. E. Sawyer, H. C. Freetly, and **K. E. Hales**. Effects of feeding monensin to bred heifers in a drylot on nutrient and energy balance. J. Anim. Sci. 96:1171-1180. 2018.
52. *Paz, H. A.*, **K. E. Hales**, J. E. Wells, L. A. Kuehn, H. C. Freetly, M. L. Spangler, and S. C. Fernando. Rumen bacterial community structure impacts feed efficiency in beef cattle. J. Anim. Sci. 96:1045-1058. 2018.
53. Watson, A. K., **K. E. Hales**, M. J. Hersom, G. W. Horn, J. Wagner, C. R. Krehbiel, M. P. McCurdy, and G. E. Erickson. Mineral retention of growing and finishing beef cattle across different production systems. Prof. Anim. Sci. 34:250-260. 2018.
54. Cunningham, H. C., K. M. Cammack, **K. E. Hales**, H. C. Freetly, and A. K. Lindholm-Perry. Abundance of transcripts for enzymes associated with lipid metabolism and mitochondrial energy production in the adipose tissue of mature cows with variation in body weight during feed restriction and realimentation. Plos One. 13:e0194104. 2018.
55. Spiehs, M. J., *J. P. Jaderborg*, **K. E. Hales**, A. DiCostanzo, G. I. Crawford, and D. B. Parker. Effect of corn processing and wet distillers grains with solubles on odorous volatile organic compound emissions from urine and feces of beef cattle. Trans. ASABE. 34:591-598. 2018.
56. Drewnoski, M. D., J. Parsons, H. Blanco, D. D. Redfearn, **K. E. Hales**, and J. C. MacDonald. Forages and pastures symposium: cover crops in livestock production: whole-system approach. Can cover crops pull double duty: Conservation and profitable forage production in the Midwestern U.S.? J. Anim. Sci. 96:3503-3512. 2018.
57. *Judy, J. V*., G. C. Bachman, T. M. Brown-Brandl, S. C. Fernando, **K. E. Hales**, P. S. Miller, R. R. Stowell, and P. J. Kononoff. Energy balance and diurnal variation in

methane production as affected by feeding frequency in Jersey cows in late lactation. J. Dairy Sci. 101:108999-10910. 2018.

58. *Drehmel, O. R.*, T. M. Brown-Brandl, J. V. Judy, S. C. Fernando, P. S. Miller, **K. E. Hales,** and P. J. Kononoff. The influence of fat and hemicellulose on methane production and energy utilization in lactating Jersey cattle. J. Dairy Sci. 101:7892-7906. 2018.
59. *J. V. Judy*, G. C. Bachman, T. M. Brown-Brandl, S. C. Fernando, **K. E. Hales**, K. J. Harvatine, P. S. Miller, and P. J. Kononoff. Increasing the concentration of linolenic acid in diets fed to Jersey cows in late lactation does not affect methane production. J. Dairy Sci. 102:2085-2093. 2019.
60. *Reynolds, M. A*., T. M. Brown-Brandl, J. V. Judy, K. Herrick, **K. E. Hales**, A. K. Watson, P. J. Kononoff. Use of indirect calorimetry to evaluate utilization of energy in lactating Jersey dairy cattle consuming common coproducts. J. Dairy Sci. 102:320-333. 2019.
61. *Judy, J. V.*, G. C. Bachman, T. M. Brown-Brandl, S. C. Fernando, **K. E. Hales**, P. S. Miller, R. R. Stowell, and P. J. Kononoff. Reducing methane production with corn oil and calcium sulfate: responses on whole-animal energy and nitrogen balance in dairy cattle. J. Dairy Sci. 102:2054-2067. 2019.
62. **Hales, K. E.** Relationships between digestible energy and metabolizable energy in current feedlot diets. Trans. Anim. Sci. 3:945-952. 2019.
63. Van Lingen, H. J., M. Niu, E. Kebreab, S. C. Valadares Filho, J. A. Rooke, A. Schwarm, M. Kreuzer, P. I. Hynd, M. Caetano, M. Eugene, C. Martin, M. McGee, P. O'Kiely, M. Hunerberg, T. A. McAllister, J. D. Messana, N. Peiren, A. V. Chaves, E. Charmley, **K. E. Hales**, N. A. Cole, S. S. Lee, A. R. Bayat, A. Berndt, A. N. Hristov. Prediction of beef cattle enteric methane production, yield and intensity using an intercontinental database. Agric., Ecos, and Environ. 283, article number 106575. 2019.
64. *Morris, D. L.*, T. B. Brown-Brandl, **K. E. Hales**, K. J. Harvatine, and P. J. Kononoff. Effects of high-starch or high-fat diets formulated to be isoenergetic on energy and nitrogen partitioning and utilization in lactating Jersey cows. J. Dairy Sci. 103:4378-4389. 2020.
65. *Blom, E. J.*, W. W. Gentry, R. H. Pritchard, and **K. E. Hales**. Evaluation of inclusion of hay, dampened hay, and silage in receiving diets of newly weaned beef calves. Appl. Anim. Sci. 36:367-376. 2020.
66. *Baber, J. R.*, T. A. Wickersham, J. E. Sawyer, H. C. Freetly, T. M. Brown-Brandl, and **K. E. Hales.** The effects of diet type on nutrient utilization and energy balance in drylot heifers. J. Anim. Sci. 98:1-8. 2020.
67. *Gentry, W. W.*, E. J. Blom, R. H. Pritchard, and **K. E. Hales**. Effect of anabolic hormone exposure during the backgrounding -phase in calf-fed steers of different mature sizes. Trans. Anim. Sci. 4:950-966. 2020.
68. *Fuller, A*. L., T. A. Wickersham, J. E. Sawyer, H. C. Freetly, T. M. Brown-Brandl, and K. E. Hales. The effects of the forage-to-concentrate ratio on the conversion of digestible energy to metabolizable energy in growing beef steers. J. Anim. Sci. 98:1-10. 2020.
69. *Abbas, W*., J. T. Howard, H. A. Paz, **K. E. Hales**, J. E. Wells, L. A. Kuehn, G. E. Erickson, M. L. Spangler, and S. C. Fernando. Influence of host genetics in shaping the rumen bacterial community in beef cattle. Sci. Reports. 10:15101. 2020.
70. Parker, D. B., K. D. Casey, **K. E. Hales**, H. M. Waldrip, B. Min, E. L. Cortus, B. L. Woodbury, M. Spiehs, B. Meyer, and W. Willis. Toward modeling of nitrous oxide

emissions following precipitation, urine, and feces deposition on beef cattle feedyard surfaces. Trans. ASABE. 63:1371-1384. 2020.

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76. *Smock, T. M.*, D. R. Woerner, A. L. Petry, J. L. Manahan, C. L. Helmuth, C. C. Coppin, and **K. E. Hales**. Effects of feedlot bunk management and bulk density of steam-flaked corn on growth performance, carcass characteristics, and liver score of finishing beef steers fed diets without tylosin phosphate. Appl. Anim. Sci. 37:722-732. 2021.
77. *Min, B.*, D. B. Parker, D. K. Brauer, H. M. Waldrip, C. C. Lockard, A. Akbay, S. Augyte, **K. E. Hales**. The role of seaweed as a potential dietary supplementation for enteric methane mitigation in ruminants: challenges and opportunities. Anim. Nutr. 7:1371-1387. 2021.
78. *Crawford, D. M.*, **K. E. Hales**, T. M. Smock, N. A. Cole, and K. L. Samuelson. The impact of changes in finishing diets and growth technologies on animal growth performance and the carbon footprint of cattle feeding: 1990 to 2020. Appl. Anim. Sci. 38:47-61. 2022.
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83. *Long, N. S.*, J. E. Wells, E. D. Berry, J. F. Legako, D. R. Woerner, G. H. Loneragan, P. R. Broadway, J. A. Carroll, N. C. Sanchez, S. C. Fernando, C. M. Coppin, C. L. Helmuth, T. M. Smock, J. L. Manahan, A. A. Hoffman, and **K. E. Hales**. Metaphylactic antimicrobial effects on occurrences of antimicrobial resistant *Salmonella*, *Escherichia coli*, and *Enterococcus* spp. measured longitudinally from feedlot arrival to harvest in high-risk cattle J. Appl. Micro. 111:1-16. 2022.
84. Galyean, M. L. and **K. E. Hales**. Short Communication: Prediction of methane per unit of dry matter intake in growing and finishing cattle from the ratio of dietary starch to neutral detergent fiber alone or in combination with dietary ether extract. J. Anim. Sci. 9:skac243. 2022.
85. *Coppin, C. M.*, T. M. Smock, C. L. Helmuth, J. L. Manahan, N. S. Long, A. A. Hoffman, J. A. Carroll, P. R. Broadway, N. C. Burdick Sanchez, J. E. Wells, S. C. Fernando, and **K. E. Hales**. The effects of administering different metaphylactic antimicrobials on growth performance and health outcomes of high-risk, newly received feedlot steers. Accepted. Trans. Anim. Sci. 4:txac140. 2022.
86. Word, A. B., P. R. Broadway, N. C. Burdick-Sanchez, J. A. Carroll, **K. E. Hales**, K. J. Karr, B. P. Holland, G. B. Ellis, C. Maxwell, L. G. Canterbury, J. T. Leonard, D. LaFleur, J. E. Hergenreder, and S. J. Trojan. The effect of supplementing CLOSTAT 500 (Bacillus subtilis PB6) to yearling steers in a commercial feedyard on health, *Salmonella* spp. prevalence, feedlot growth performance and carcass characteristics. Trans Anim. Sci. 4:txac131. 2022.
87. Galyean, M. L. and **K. E. Hales**. Non-antimicrobial methods to control liver abscesses. Vet. Clin. North Am. 38:395-404. 2023.
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89. Burdick Sanchez, N. C., J. W. Dailey, P. R. Broadway, E. M. Davis, B. M. Bowen, A. L. Petry, M. A. Ballou, **K. E. Hales**, J. A. Carroll. A viable less-invasive alternative for continuous temperature measurement in weaned pigs. Livest. Sci. 267:105126. 2023.
90. Galyean, M. L. and **K. E. Hales**. Feeding management strategies to mitigate methane and improve production efficiency in feedlot cattle. Animals. 13:758. 2023.
91. *Hoffman, A. A.*, N. S. Long, J. A. Carroll, N. C. Burdick Sanchez, P. R. Broadway, J. T. Richeson, T. C. Jackson, and **K. E. Hales**. Technical note: Infrared thermography as an alternative for measuring body temperature in cattle. Appl. Anim. Sci. 39:94-98. 2023.
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93. *Smock, T. M.*, P. R. Broadway, N. C. Burdick Sanchez, J. A. Carroll, M. E. Theurer, and **K. E. Hales**. An updated profile of the bovine acute phase response following an intravenous lipopolysaccharide challenge. J. Anim. Sci. 3:101:skad133. 2023.
94. *Dornbach, C. W.*, **K. E. Hales**, E. Gubbels, J. E. Wells, A. A. Hoffman, A. N. Hanratty, D. J. Line, T. M. Smock, J. L. Manahan, Z. S. McDaniel, K. B. Kohl, N. C. Burdick Sanchez, J. A. Carroll, Z. K. F. Smith, and P. R. Broadway. Longitudinal assessment of prevalence and incidence of Salmonella and Escherichia coli O157:H7 resistance to antimicrobials in feedlot cattle sourced and finished in different regions of the U.S. Foodborne Pathogens and Dis. 8:1-9. 2023.
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96. *McDaniel, Z. S.*, **K. E. Hales**, T. G. Nagaraja, T. E. Lawrence, R. G. Amachawadi, J. A. Carroll, N. C. Burdick Sanchez, M. L. Galyean, T. M. Smock, M. A. Ballou, V. S. Machado, and P. R. Broadway. 2023. Short communication: evaluation of an endotoxin challenge and intraruminal bacterial inoculation model to induce liver abscesses in Holstein steers. Submitted to J. Anim. Sci. 101:skad242.
97. Galyean, M. L., **K. E. Hales**, and Z. K. Smith. Evaluating differences between formulated net energy values and net energy values determined from growth performance in finishing beef steers. Submitted to J. Anim. Sci. 101:skad230.
98. Wells, J. E., E. D. Berry, M. Kim, J. L. Bono, N. Kalchayanand, **K. E. Hales**, K. N. Norman, and A. K. Benson. A longitudinal study of Escherichia coli O157:H7 and non-O157 Shiga-toxigenic Escherichia coli in feces of cattle fed forage and concentrate diets. Foodborne Pathog. and Dis. 9:375-381. 2023.
99. Galyean, M. L. and K. E. Hales. 2023. Evaluation of methods to assess variation in dry matter intake over time in feedlot cattle. Appl. Anim. Sci. 6:391-399. 2023.
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101. *McDaniel, Z. S.*, **K. E. Hales**, T. G. Nagaraja, T. E. Lawrence, R. G. Amachawadi, J. A. Carroll, N. C. Burdick Sanchez, M. L. Galyean, T. M. Smock, M. A. Ballou, V. S. Machado, E. Davis, and P. R. Broadway. Development of an experimental model to induce liver abscesses in steers using an acidotic diet and bacterial inoculation. J. Anim. Sci. 3:102:skae046. 2024.
102. *Pfau, A. P.*, M. T. Henniger, K. L. Samuelson, **K. E. Hales**, C. A. Loest, M. E. Hubbert, A. K. Lindholm-Perry, A. M. Egert-McLean, K. Mason, E. A. Shepherd, B. H. Boy, P. R. Myer. Effects of protein concentration and beta-adrenergic agonists on ruminal microbial communities in finishing beef heifers. PLoS ONE. 19(2): e0296407. 2024.
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Broadway, and **K. E. Hales**. The use of a novel direct-fed microbial as an alternative for tylosin phosphate to control liver abscesses and decrease antimicrobial use in finishing beef steers. Accepted to Appl. Anim. Sci. 40:307-317. 2024.

104. *McDaniel, Z. S.*, M. L. Galyean, P. R. Broadway, J. A. Carroll, N. C. Burdick Sanchez, A. N. Hanratty, C. W. Dornbach, D. J. Line, T. M. Smock, J. L. Manahan, and **K. E. Hales**. The effects of increasing roughage neutral detergent fiber concentration and bulk density of steam-flaked corn on growth performance, carcass characteristics, and liver abscesses in finishing beef steers fed diets without tylosin phosphate. Appl. Anim. Sci. 40:269-279. 2024.

105. Wilson, R. A., B. J. Johnson, J. O. Sarturi, W. L. Crossland, **K. E. Hales**, R. J. Rathmann, C. L. Bratcher, M. E. Theurer, R. G. Amachawadi, T. G. Nagaraja, S. E. Speidel, R. M. Enns, M. G. Thomas, B. A. Foraker, M. A. Cleveland, and D. R. Woerner. Identification of blood-based biomarkers for detection of liver abscesses in beef x dairy heifers. Appl. Anim. Sci. 40:386-398. 2024.

106. *Cox, H. E.*, P. R. Menta, T. G. Nagaraja, W. L. Crossland, **K. E. Hales**, D. D. Henry, C. Strieder-Barboza, P. R. Broadway, J. A. Carroll, M. A. Ballou, and V. S. Machado. Injecting Fusobacterium necrophorum into the peripheral circulation or hepatic portal vein of preruminant Holstein calves failed to induce liver abscesses. Appl. Anim. Sci. 40:421-420. 2024.

107. Lindholm-Perry, A. K., B. N. Keel, **K. E. Hales**, J. E. Wells, L. A. Kuehn, J. W. Keele, M. S. Crouse, D. J. Nonneman, T. G. Nagaraja, T. E. Lawrence, R. G. Amachawadi, J. A. Carroll, N. C. Burdick Sanchez, and P. R. Broadway. Ileal epithelial tissue transcript profiles of steers with experimentally induced abscesses. Appl. Anim. Sci. 40:414-420. 2024.

108. Galyean, M. L. and **K. E. Hales**. Relationships between dietary chemical components and enteric meth40:ane production and application to diet formulation in beef cattle. Accepted to Methane. 3:1-11. 2024.

109. Broadway, P. R., T. G. Nagaraja, T. E. Lawrence, M. L. Galyean, and **K. E. Hales**. Liver abscesses – new perspectives on a historic fed cattle issue. Appl. Anim. Sci. 40:237-244. 2024.

110. *McDaniel, Z. S.*, **K. E. Hales**, T. G. Nagaraja, T. E. Lawrence, T. C. Tennant, R. G. Amachawadi, J. A. Carroll, N. C. Burdick Sanchez, M. L. Galyean, E. Davis, K. Kohl, D. J. Line, C. W. Dornbach, M. Abbasi, A. Deters, X. Shi, M. A. Ballou, V. S. Machado, T. M. Smock, and P. R. Broadway. Validation of an experimental model to induce liver abscesses in Holstein steers using an acidotic diet challenge and intraruminal bacterial inoculation. Appl Anim. Sci. 40:414-421. 2024.

111. **Hales, K. E**. REVIEW: Summary of the Special Issue on liver abscesses in cattle and thoughts on future research. Appl. Anim. Sci. 40:430-436. 2024.

112. Varga, J. J., T. C. Menezes, B. Auverman, J. Derner, G. Thoma, **K. Hales**, K. Johnson, A. Leytem, S. Place, J. Plaut, J. Ritten, J. Sheehan, L. Thompson, K. Stackhouse-Lawson. Net zero initiative in beef and dairy systems: Roadmap and research agenda for the U.S. beef and dairy production. Env. Res. Comm. 2024.

113. Barker, S. N. T. C. Jackson, N. C. Burdick Sanchez, J. A. Carroll, P. R. Broadway, **K. E. Hales**, G. Ducharme, J. F. Legako, and J. T. Richeson. The effect of methionine supplementation on receiving beef steers following a lipopolysaccharide challenge. Trans. Anim. Sci. Accepted October 3, 2024.

114. *Boyd, B. M.*, B. W. Neville, **K. E. Hales**, A. P. Foote, S. D. Shackelford, and G. E. Erickson. Effect of urea and distillers inclusion in dry-rolled corn-based diets on heifer performance and carcass characteristics. Appl. Anim. Sci. Accepted December 3, 2024.
115. *Dornbach, C. W.*, J. E. Wells, E. D. Berry, S. C. Fernando, P. R. Broadway, and **K. E. Hales**. Assessment of antimicrobial exposure on generic Escherichia coli and Enterococcus spp. concentration, prevalence, and resistance to antimicrobials in beef cattle raised with or without antimicrobials. Foodborne Path. And Dis. Submitted October 2, 2024.
116. *DeHaan, E. R.*, C. W. Dornbach, A. D. Blair, N. C. Burdick Sanchez, J. A. Carroll, P. R. Broadway, W. C. Rusche, **K. E. Hales**, and Z. K. Smith. Influence of source and origin and region of finishing on growth performance and carcass characteristics of finishing heifers fed in the United States. J. Anim. Sci. Submitted, September 28, 2024.
117. *A. A. Hoffman*, S. C. Fernando, J. E. Wells, N. S. Long, Z. S. McDaniel, T. M. Smock, P. R. Broadway, N. C. Burdick Sanchez, and **K. E. Hales**. Effects of a novel direct-fed microbial on occurrences of antimicrobial resistance in Salmonella enterica, Escherichia coli, and Enterococcus spp. measured longitudinally from feedlot arrival to harvest in finishing beef steers. Foodborne Path. And Dis. Submitted October 7, 2024.
118. *Thompson, A. B.*, T. L. Perkins, T. E. Lawrence, R. . Amachawadi, T. G. Nagaraja, P. R. Broadway, N. C. Burdick Sanchez, V. Machado, M. L. Galyean, and **K. E. Hales**. Efficacy of ultrasonography to detect liver abscesses in cattle. Appl. Anim. Sci. Accepted October 27, 2024.
119. *Childress, K. D.*, **K. E. Hales**, T. G. Nagaraja, T. E. Lawrence, R. G. Amachawadi, N. C. Burdick Sanchez, A. C. Thompson, A. N. Hanratty, C. W. Dornbach, M. Abbasi, X. Shi, M. L. Galyean, and P. R. Broadway. Evaluating the effects of acidosis and bacterial inoculum concentrations on the development of liver abscesses in beef × dairy systems. Appl. Anim. Sci. Submitted October 7, 2024.
120. *Hanratty, A. N.*, K. E. Hales, C. W. Dornbach, N. C. Burdick-Sanchez, A. B. Word, B. P. Holland, C. L. Maxwell, J. E. Hergenreder, L. G. Canterbury, J. T. Leonhard, J. Vasconcelos, D. LaFleur, S. Trojan, and P. R. Broadway. The effects of supplementing Bacillus subtilis PB6 on health outcomes, Salmonella spp. prevalence, growth performance, and carcass characteristics in finishing beef cattle. Submitted to Appl. Anim. Sci. December 15, 2024.
121. *Grant, M.S.* K. E. Hales, M. A. Ballou, and M. L. Galyean. Review: Production and prediction of enteric methane and potential mitigation strategies in dairies in the Texas Panhandle and surrounding areas. Submitted to Appl. Anim. Sci. December 15, 2024.

INVITED PRESENTATIONS AND LECTURES Total of 37

1. **Hales, K. E.** Use of Soybean Hulls as a Complementary Feedstuff to Winter Rye Pasture and Subsequent Finishing Performance of Beef Cattle. Samuel Roberts Noble Foundation Winter Pasture Symposium, Ardmore, OK, 2006.
2. **Hales, K. E.** Winter Rye Production Programs for Growing Beef Cattle. Samuel Roberts Noble Foundation Ardmore, OK, 2006.

3. **Hales, K. E.** The role of gut peptides in hunger and satiety. Principles of Nutrition, Texas Tech University, Lubbock, TX, guest lecture. 2008.
4. **Hales, K. E.** The Effects of Grain Processing and Roughage Level on Finishing Cattle Performance. USDA-ARS Conservation and Production Research Laboratory, Bushland, TX, 2009.
5. **Hales, K. E.** A Brief Biography and Research Priorities for Feedlot and Grower Segments of the Beef Cattle Industry. USDA-ARS U.S. Meat Animal Research Center, Clay Center, NE, 2010.
6. **Hales, K. E.** The Healthfulness of Meat. Lincoln, NE, 2011.
7. **Hales, K. E.** Environmental Issues Facing the Beef Cattle Industry, Challenges and Some Possible Solutions. Husker Nutrition Conference, University of Nebraska, Lincoln, NE, 2010.
8. **Hales, K. E.** Research update. The Plains Nutrition Conference Annual Meeting, San Antonio, TX, 2011.
9. **Hales, K. E.** Use of Technology in the Beef Industry. The Southwest Beef Symposium, Amarillo, TX, 2011.
10. **Hales, K. E.** and H. C. Freetly. Research update. The Plains Nutrition Conference Annual Meeting, San Antonio, TX, 2013.
11. **Hales, K. E.** Environmental Impact of New Feeding Choices in the Feedlot Industry. Midwest Section of the American Society of Animal Science, Des Moines, IA, 2013.
12. **Hales, K. E.** The Use of Roughage and Beta-Agonists in Feedlot Diets. Iowa Beef Professional Development Conference, Des Moines, IA 2013.
13. **Hales, K. E.** Effects of Corn Processing Method and Dietary Inclusion of Wet Distillers Grains with Solubles on Enteric Methane Emissions of Finishing Cattle. The Livestock and Environmental Learning Center Conference, Denver, CO, 2013.
14. **Hales, K. E.** Respiration Calorimetry Techniques and Applications. South Dakota State University, Brookings, SD, 2016.
15. **Hales, K. E.** Research Update. The Plains Nutrition Conference Annual Meeting, San Antonio, TX 2017.
16. **Hales, K. E.** Applied Beef Cattle Research at MARC. Texas A & M University, College Station, TX, 2017.
17. **Hales, K. E.** Beef Cattle Energetics. Advanced Ruminant Nutrition, Oklahoma State University, Stillwater, OK, guest lecture, 2017.
18. **Hales, K. E.** Improving Feed Efficiency in Beef Cattle. Oklahoma State University, Stillwater, OK, 2017.
19. **Hales, K. E.** Relationships Among DE, ME, and NE in Current Feedlot Diets. The 50th Anniversary of the California Net Energy System Symposium, Davis, California, 2018.
20. **Hales, K. E.** Setting up a Respiration Calorimetry System for Beef Cattle. Nutrition Group Seminar, South Dakota State University, guest lecture, 2018.
21. **Hales, K. E.** Introduction to Beef Cattle Energetics. Beef Cattle Energetics. South Dakota State University, guest lecture, 2019.
22. **Hales, K. E**. Texas Tech University Feedlot Research Update. Texas Cattle Feeders Association, 2019.
23. **Hales, K**. **E.** How to Secure a Federal Grant. College of Agricultural Sciences and Natural Resources, 2021.

24. **Hales, K.E.** Methane Production from Beef Cattle and Options for Mitigation. Ag Next Sustainability Summit. Fort Collins, Colorado. 2021.
25. **Hales, K. E.** and A. K. Lindholm-Perry. Unraveling the Genes and Markers Contributing to Body Weight Gain in Heifers and Cows. Beef Improvement Federation, Las Cruces, NM. 2022.
26. **Hales, K**. E. and M. L. Galyean. Predicting Metabolizable Energy from Digestible Energy for Growing and Finishing Beef Cattle and Relationships to Prediction of Methane. American Society of Animal Science Annual Meeting. Oklahoma City, Oklahoma. 2022.
27. **Hales, K. E.**, M. L. Galyean, and Z. K. F. Smith. Evaluating the difference between formulated dietary net energy values and net energy values determined from growth performance and estimates of shrunk body weight gain in finishing beef cattle. American Society of Animal Science Annual Meeting. Oklahoma City, Oklahoma. 2022.
28. **Hales, K. E.** Creating a marketplace for climate-smart beef. Texas and Southwestern Cattle Raisers Association Summer Meeting. Santa Fe, New Mexico. 2022.
29. **Hales, K. E.** and K. Stackhouse-Lawson. Methane Mitigation Strategies for the United States Beef Industry. Beef Alliance Virtual Meeting. 2022.
30. **Hales, K. E.** Development of a Liver Abscess Model in Dairy Calves. Female Focused Feedyard Nutrition Research Meeting. Chama, New Mexico. 2022.
31. **Hales, K. E.** New advances in liver abscess research. Zoetis National Sales Conference Short Course. Lubbock, Texas. 2023.
32. **Hales, K. E.** and M. L. Galyean. The science behind methane: Using respiration calorimetry to estimate energy balance and methane emissions. American Society of Animal Science, Midwest Section. Madison, Wisconsin. 2024.
33. **Hales, K. E.** Relationships between dietary chemical components and methane production. Oklahoma State University. Stillwater, Oklahoma. 2024.
34. **Hales, K. E.** From graduate student to distinguished graduate. Oklahoma State University. Stillwater, Oklahoma. 2024.
35. **Hales, K. E.** Thoughts on future of liver abscess research in cattle. Plains Nutrition Council. San Antonio, Texas. 2024.
36. **Hales, K. E.** Award Talk: Using respiration calorimetry to estimate methane emissions. American Society of Animal Science, Annual Meeting. Calgary, Alberta, Canada. 2024.
37. **Hales, K. E.** Integration of multidisciplinary research towards a common goal. Davis College Sustainable Food and Fiber Research Conference. Lubbock, TX. 2024.

Graduate Student Advising and Committees Total 38

Graduate Student	Completion Year	Degree	Role	Location
Bradley Boyd	2014	M.S.	Committee	University of Nebraska
Sarah Hartman	2016	M.S.	Committee	Iowa State University
Courtney Hemphill	2016	M.S.	Committee	Texas A&M University
Jessica Baber	2017	Ph.D.	Committee	Texas A&M University
Jordan Cox	2017	M.S.	Committee	University of Nebraska
Jared Judy	2017	Ph.D.	Committee	University of Nebraska

Amanda Fuller	2018	Ph.D.	Committee	Texas A&M University
Olivia Drehmel	2018	M.S.	Committee	University of Nebraska
Bradley Boyd	2019	Ph.D.	Committee	University of Nebraska
Michela Reynolds	2019	M.S.	Committee	University of Nebraska
Wes Gentry	2019	Ph.D.	Advisor	South Dakota State University
Ethan Blom	2019	Ph.D.	Advisor	South Dakota State University
Wyatt Smith	2019	M.S.	Advisor	South Dakota State University
Tosha Orpheim	2019	Ph.D.	Committee	Texas Tech University
Logan Morris	2020	Ph.D.	Committee	South Dakota State University
Paige Spowart	2020	M.S.	Committee	West Texas A&M University
Warren Rusche	2021	Ph.D.	Committee	South Dakota State University
Cory Helmuth	2021	M.S.	Advisor	Texas Tech University
Carley Coppin	2021	M.S.	Advisor	Texas Tech University
Wyatt Smith	2021	Ph.D.	Committee	West Texas A&M University
David Crawford	2021	Ph.D.	Committee	West Texas A&M University
Taylor Smock	2022	Ph.D.	Advisor	Texas Tech University
Nate Long	2022	M.S.	Advisor	Texas Tech University
Ashley Hoffman	2022	M.S.	Advisor	Texas Tech University
Daniel Young	2022	M.S.	Committee	Texas Tech University
Luke Fuerniss	2022	Ph.D.	Committee	Texas Tech University
Kesley Kohl	2023	M.S.	Committee	Texas Tech University
Jeff Manahan	2023	M.S.	Advisor	Texas Tech University
Zach McDaniel	2024	Ph.D.	Advisor	Texas Tech University
Sam Barker	2024	Ph.D.	Committee	Texas Tech University
Sashank Reddy Avula Balaiahgari	2024	M.S.	Committee	Texas Tech University
Colten Dornbach	2025	Ph.D.	Advisor	Texas Tech University
Dalton Line	2025	M.S.	Advisor	Texas Tech University
Ashlee Hanratty	2025	M.S.	Advisor	Texas Tech University
Kallie Childress	2025	M.S.	Advisor	Texas Tech University
Landon Canterbury	2027	Ph.D.	Advisor	Texas Tech University
Taylor Loeffler	2027	Ph.D.	Advisor	Texas Tech University
Blake Stika	2026	M.S.	Advisor	Texas Tech University

<u>Undergraduate Research Scholars</u> Total 6

Molly Johnson, 2020 – 2022

Payton Royall, 2021 – 2022

Kyle Vahlenkamp, 2022 – 2024

Macy Lawrence, 2023 – 2024

Madelynn Baker, 2023 – 2024

Matthew Self, 2024

Post Doctoral Advising Total 1

Post Doc	Completion Year	Role	Location
Dr. Maddie Grant	2026	Mentor	Texas Tech University

Graduate Degrees Completed as Advisor: Total 10

1. Helmuth, Cory, M.S. 2021.
2. Coppin, Carley, M.S. 2021.
3. Long, Nate, M.S. 2022.
4. Ashley Hoffman, M.S. 2022.
5. Taylor Smock, Ph.D. 2023.
6. Jeff Manahan, M.S. 2023.
7. Dalton Line, M.S. 2023.
8. Ashlee Hanratty, M.S. 2023.
9. Zach McDaniel, Ph.D. 2024.
10. Kallie Childress, M.S. 2024.
11. Sashank Reddy Avula Balaiahgari, M.S. 2024.

TEACHING RESPONSIBILITIES

Term	Course	Title	Credit	Enrollment	Evaluation*
SP 2020	ANSC 5001	Special Problems – Energetics	3	15	N/A
SP 2021	ANSC 5001	Special Problems – Scientific Writing	3	16	4.9/4.8
SP 2022	ANSC 5001	Special Problems – Nutrient Requirements of Beef Cattle	3	7	4.8/4.8

*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 (i.e., 4.8/4.9).

GRANTS AND AWARDS Career total funded: $4,585,945.03 ($4,059,863.03 federal funding); $3,130,112.03 total funding since hire date ($2,729,112.03 federal funding since hire date).

Year	Project	Sponsor	Amount
2010	The effects of crude glycerin on methane production in finishing beef steers. **K. E. Hales (PI)** and N. A. Cole.	Texas Cattle Feeder's Association	$5,000
2013	The impact of feeding Zilmax with cattle undergoing heat stress on behavior,	Nebraska Beef Council	$50,000

	temperature, and performance. **K. E. Hales (PI)**		
2018	Investigating mobile genetic elements and resistance gene reservoirs towards understanding the emergence and ecology of antimicrobial resistance in beef cattle production systems. S. C. Fernando, J. E. Wells, and **K. E. Hales**.	USDA-National Institute of Food and Agriculture – Agriculture and Food Research Initiative	$830,751
2018	Moving beyond rumen microbiota composition to identify interactions between host genotype and rumen function. S. C. Fernando, **K. E. Hales**, J. E. Wells, L. A. Kuehn, and M. S. Spangler.	USDA-National Institute of Food and Agriculture – Agriculture and Food Research Initiative	$500,000
2018	The impacts of conventional beef cattle production on antimicrobial resistance in the animal and the environment. **K. E. Hales (PI)**, J. E. Wells, and S. C. Fernando.	Nebraska Beef Council	$50,000
2018	Use of modern diets and technology on the carbon footprint of beef production. **K. E. Hales (PI)** and K. A. Samuelson.	National Cattlemen's Beef Association	$20,082
2019	Decreasing the environmental impact on cattle production systems in the southern high plains. **K. E. Hales (PI)**.	USDA-Agricultural Research Service-Cooperative Research Agreement	$105,001
2020	Investigating the emergence and ecology of antimicrobial resistance in high-risk beef cattle. **K. E. Hales (PI)**, G. Loneragan, J. E. Wells, M. Boselivac, S. C. Fernando, and A. Schmidt.	USDA-National Institute of Food and Agriculture – Agriculture and Food Research Initiative	$1,000,000
2020	Evaluation of spatial and longitudinal distribution of antimicrobial resistance genes and occurrence of potential horizontal gene transfer in high-risk cattle. **K. E. Hales (PI)**, J. E. Wells, and S. C. Fernando.	National Cattlemen's Beef Association	$225,000
2020	Understanding the effect of phenotype expression in the dairy beef model on beef quality. D. R. Woerner, J. F. Legako, B. J. Johnson, R. Rathmann, and **K. E. Hales.**	National Cattlemen's Beef Association	$87,000
2020	Development of a science-based management strategy to reduce the use of antimicrobials in high-risk beef cattle. **K. E. Hales (PI)**, V. Machado, C. L. Bratcher, K. C. Swanson, J. E. Wells, M. Theurer, T. Jones, P. R. Broadway, N. C. Burdick-Sanchez, and J. A. Carroll.	Foundation For Food and Agriculture Research	$400,000

2022	Novel strategies to improve the understanding of liver abscess formation in beef cattle. **K. E. Hales (PI)**, V. Machado, J. Legako, D. R. Woerner, P. R. Broadway, J. E. Wells, S. C. Fernando, M. Theurer, and T. Jones.	Foundation for Food and Agriculture Research	$250,000
2022	Effects of restricted/programmed feeding on methane production, growth performance, carcass characteristics, carbon footprint, and economics in finishing beef cattle. **K. E. Hales (PI)**, M. L. Galyean, and M. Rahman.	National Cattlemen's Beef Association	$200,000
2022	Cattlemen's perceptions of sustainability initiatives: insight for messaging about sustainable practices. L. Fischer (PI) and **K. E. Hales.**	National Cattlemen's Beef Association	$89,000
2023	Development of a model to induce liver abscesses in beef cattle. **K. E. Hales**	USDA – Agricultural Research Service	$100,000
2024	Effects of random metaphylaxis on Salmonella shedding, health outcomes, and growth performance in high-risk beef cattle. **K. E. Hales (PI)**, T. A. McDaneld, and P. R. Broadway.	USDA - Agricultural Research Service	$90,000
2024	Tackling liver abscesses in cattle by exploring pathogenesis and developing nutritional strategies to decrease prevalence. **K. E. Hales (PI)**, M. L. Galyean, O. Benitez, P. R. Broadway, T. G. Nagaraja, A. M. Amachawadi, and T. E. Lawrence.	USDA-National Institute of Food and Agriculture – Agriculture and Food Research Initiative	$650,000
2024	Development of a model to induce liver abscesses in beef cattle. **K. E. Hales**	USDA-Agricultural Research Service	$83,333.25
2024	Evaluation of a bacterial probiotic, butyric acid, and red clover in calves to reduce the incidence and severity of liver abscesses **K. E. Hales**	USDA-Agricultural Research Service	$50,777.78

SERVICE PROFESSIONAL SERVICE:

Texas Tech University:

1. Faculty Supervisor, Burnett Center for Research and Instruction – present
2. Graduate Research Committee, College of Agricultural Sciences and Natural Resources, 2019 – present
3. Search Committee Member: Veterinary Science Faculty Position – 2020
4. Search Committee Member: Thornton Distinguished Chair in Plant and Soil Sciences 2020 – present
5. Mentoring Committee Member: Dr. Gunvant Patil, Assistant Professor, Plant and Soil Sciences

6. Mentoring Committee Chair: Dr. Amy Petry, Assistant Professor, Animal and Food Sciences
7. Mentoring Committee Member: Dr. Whitney Crossland, Assistant Professor, Animal and Food Sciences
8. Search Committee Member: Grant Writer, College of Agricultural Sciences and Natural Resources, 2021
9. Search Committee Member: Business Manager, Animal and Food Sciences, 2021-present
10. Outside Promotion and Tenure Committee Member: Plant and Soil Sciences, 2021
11. Search Committee Member: Dean of Davis College of Agricultural Sciences and Natural Resources, 2021 to present
12. Bob Albin Graduate Research Competition Coordinator: Animal and Food Sciences, 2022 – present
13. Search Committee Member: Assistant Professor of Companion Animal Science, 2023.
14. Search Committee Member: Post Award Grans Specialist, Davis College, 2023.
15. Outside Promotion and Tenure Committee Member: Plant and Soil Sciences, 2024
16. Mentoring Committee Member: Dr. Kalavathy Rajan, Assistant Professor, Department of Plant and Soil Science.

National:

1. American Society of Animal Science, Graduate Program Committee Member, 2007-2009.
2. Midwest Section of the American Society of Animal Science, Committee Member, Ruminant Nutrition Program Committee, 2015-2017.
3. Midwest Section of the American Society of Animal Science, Committee Chairperson, Ruminant Nutrition Program Committee, 2016-2017
4. American Society of Animal Science, Animal Production Committee, 2017-2019
5. Graduate Student Feedlot Nutrition Boot Camp, Plains Nutrition Council, Faculty Facilitator, 2022, 2024
6. Executive Committee Member, Plains Nutrition Council, 2022- 2026
7. Provided Expert Peer Review for the USDA *Methods for Quantifying Greenhouse Gas Fluxes in Agriculture and Forestry: Methods for Entity-Scale Inventory* report. 2022. Chapters: Quantifying Greenhouse Gas Sources and Sinks in Animal Production Systems and Considerations When Estimating Agriculture and Forestry GHG Emissions and Removals.
8. Grant panel reviewer, USDA, NIFA-AFRI. 2016, 2017, 2020, 2021
9. President of the Plains Nutrition Council, 2023-2024
10. President of the American Registry of Professional Animal Scientists, 2023-2024

International:

1. Meat Livestock Australia, Advisor for Feedlot Research. 2019-present
2. Provided Expert Peer Review for The National Academies of Sciences, Engineering, and Medicine, *Nutrient Requirements of Dairy Cattle, 8th edition*. Chapters: Defining Requirements, Energy, Growth, Dairy Cattle Nutrition and the Environment, Feed Analysis, Nutrient Composition of Feeds, Nutrient Requirement Tables, 2019

3. International Symposium on Ruminant Physiology, Organizing Committee Member. 2020 to 2024
4. Meat Livestock Australia, Technical Expert for Feedlot Research. 2024

Editorial activities:

1. Created Special Issue for Liver Abscesses in Cattle, published in *Applied Animal Science*, June 2024 (18 papers). Solicited funding to cover page charges, articles to be submitted, and handled all articles throughout editorial process.
2. *Applied Animal Science*, Acting Editor-In-Chief, September through October, 2023
3. *Applied Animal Science*, Associate Editor, 2019-present
4. *Applied Animal Science*, Associate Editor-In-Chief, 2023 – present
5. *Journal of Animal Science*, Editorial Board Member, 2013-2016