Matthew Lee Spangler
Curriculum Vitae

Current Title: Professor of Animal Science/Extension Beef Genetics Specialist

Appointment:

60% Extension, 10% Teaching, 30% Research (2015-present)
60% Extension, 20% Teaching, 20% Research (2012-2015)
70% Extension, 30% Teaching (2008-2012)

Biographical Data:

Education
2003 - 2006; The University of Georgia, Ph.D. 2006
2001 - 2003; Iowa State University, M.S. 2003
1999 - 2001; Kansas State University, B.S. 2001
1997 - 1999; Butler County Community College, A.S. 1999
Employment History
Professor of Animal Science/Extension Beef Genetics Specialist, University of Nebraska-Lincoln (2018-present)
Associate Professor of Animal Science/Extension Beef Genetics Specialist, University of Nebraska-Lincoln (2012-2018)
Assistant Professor of Animal Science/Extension Beef Genetics Specialist, University of Nebraska-Lincoln (2008-2012)
Assistant Professor of Animal Science, University of Tennessee at Martin (2007)

Synergistic Activities:

Academic Service
Associate Editor, of Frontiers in Genetics - Livestock Genomics , 2019-present
Section editor, Journal of Animal Science 2016-2019
Journal of Animal Science Editorial Board Member, Animal Genetics Section, 2007-2011.
ad hoc reviewer: Professional Animal Scientist, Journal of Poultry Science, Journal of Animal Science, BMC Genomics, Journal of Animal Breeding and Genetics, Animal Genetics, South African Journal of Animal Science, Livestock Science, Animal Production Science, Animal Reproduction Science, Translational Animal Science, Computers and Electronics in Agriculture, Genetics Selection Evolution

University of Nebraska
Departmental Social Committee Member, University of Nebraska Animal Science Dept., 2008-2018.
Beef Home Study Course Advisory Committee, University of Nebraska Extension, 2008-Present.
Nebraska Youth Beef Leadership Symposium planning committee, 2008-2010.
Animal Science Undergraduate Curriculum Committee, 2009-2019.
Animal Science Graduate Student Association, Senior Advisor, 2009-2011.
Beef Excellence Initiative Steering Committee, 2009-2010

Nebraska State 4-H Livestock Judging Official, 2014.
UNL Extension Direction Team 2015-2017
West Central Review team, 2015
Internal Advisory Committee, UNL Animal Science Dept., 2017-2021
UNL extension "think tank" committee, 2017-2020
UNL Animal Science Promotion and tenure committee member, 2018-2020 (chair in 2020)
Nebraska Integrated Beef Systems Initiative Steering committee, 2018-present
Search committee chair: Theoretical quantitative geneticist (2), Functional genomics, Quantitative geneticist, cow-calf specialist, cow-calf unit manager.
Search committee member: Swine extension specialist, department head, statistical genetics, computational biology (3 positions), beef extension educator, veterinary epidemiologist, extension regional directors (3).
Gamma Sigma Delta extension award selection committee, 2018-2021.
Nebraska Integrated Beef Systems Hub faculty committee, 2021-present
Faculty Senate, 2024-Present

Discipline
NCERA-225 (old NCERA-199): Implementation and Strategies for National Beef Cattle Genetic Evaluation, Secretary, 2009-2010
Ultrasound Guidelines Council, board member, 2007-2010.
Ultrasound Guidelines Council, Statistical Review Committee Chair, 2009-2010.
Midwest Section Animal Breeding and Genetics Committee 2009-2012 (Chair 2011-2012).
World Congress on Genetics Applied to Livestock Production, GWAS tools and methods session chair, 2018.
Midwest section of ASAS, extension award selection committee, 2016-2018
US Meat Animal Research Center Beef Cattle Research Geneticist, selection committee member, 2022.
Colorado State University Rouse Ranch, Review Team Member, 2022.

Industry
Nebraska Cattlemen Cattlemen's College subcommittee, Committee Member, 2008-2017
Belted Galloway Society, Weights and Measures Committee Member, 2012-2016.
National Cattlemens Beef Association, national collegiate quiz bowl moderator, 2013.
Beef Improvement Federation Feed Intake Guidelines Subcommittee 2014-2015.
International Genetics Solutions Technical Advisory board member, 2016-present
DNA Genetics Advisory Board, 2016-present
American Gelbvieh Association technical advisory board, 2016-present
Beef Improvement Federation Guidelines Writing Committee, 2018-present (chair 2023-present)
Beef Improvement Federation Board of Directors, 2020-present
Beef Improvement Federation Selection Decisions Committee Chair, 2020-present
Genetic Merit Pricing Task Force (2023-present)
North American Limousin Foundation, Board member, 2023-present
International Genetic Solutions Scientific Advisory Committee, 2024-present

Honors and Awards Received
Cattlemen Business Weekly, Top 10 Beef Industry Leaders Under 40, 2011.
Outstanding New Specialist, Nebraska Cooperative Extension Association, 2011.

Holling Family Junior Faculty Teaching Award, UNL College of Agriculture and Natural Resources, 2012.
Wendell Burgher Beef Industry Award, UNL Institute of Agriculture and Natural Resources, 2013-2015.
Nebraska Beef Industry Endowment Award, Nebraska Cattlemen Research and Education Foundation, 2013, 2014, 2021.
Beef Improvement Federation Appreciation Award, Beef Improvement Federation, 2014.
Outstanding Young Extension Specialist Award, Midwest American Society of Animal Science, 2015.
Beef Improvement Federation Continuing Service Award, Beef Improvement Federation, 2017.
Gamma Sigma Delta Award for Excellence in Extension, UNL Gamma Sigma Delta, 2018.
Beef Improvement Federation Ambassador Award (awarded to eBEEF), Beef Improvement Federation, 2021.

Professional and Honorary Societies
American Society of Animal Science (ASAS)
American Association for the Advancement of Science (AAAS)
Gamma Sigma Delta
Nebraska Cattlemen

Teaching Accomplishments:

Primary Instructor, The University of Nebraska, January 2008 – Present.
Beef Cattle Merchandising (15 semesters)
*Beef Industry Scholars: Study Tour (*8 semesters)
Linear Models in Animal Breeding (11 semesters; online)
History and Perspectives in Animal Breeding (12 semesters; online)
Population Genetics (co-taught; 3 semesters)
Linear Models and Variance Component Estimation (2 semester)

Other Teaching Activities
UNL Teaching Herd Coordinator, January 2008 – Present
Nebraska Beef Industry Scholars Program Coordinator, January 2008-2019
Quantitative Genetics and Genomics Shortcourses: University of Sao Paulo (ESALQ), Brazil, 2016 (co-taught with Dr. Morota), 2018 (co-taught with Drs. Morota and Howard), 2019 (co-taught with Dr. Morota); CEIEPAA of the National Autonomus University of México in Tequisquiapan, Querétaro, 2019.

Extension Accomplishments:
Selected Invited Presentations **(since last promotion: 113 ; career total: 484)**

1. Heterosis in Cow Herds, Wisconsin Cattlemen's Association, Deforest, WI, Date: 02/16/2008
2. DNA marker test information: Making sense of the results, National Belted Galloway Society annual meeting, Charleston, SC, Date: 10/24/2008
3. Beef Satellite Program: Heterosis in cow herds Date: 01/14/2008
4. Beef Satellite Program: Economic Index Selection Date: 01/28/2008

5. Real-time Ultrasound: What does image quality mean to genetic evaluations, Beef Improvement Federation, Sacramento, CA, Date: 05/01/2009
6. Using genomic information to improve accuracy values of yearling bulls, Kansas Gelbvieh Association, Barnard, KS, Date: 08/15/2009
7. Using genomic information for beef cattle selection, North Dakota State University, Bovine Connection, Date: 12/03/2009
8. Fitting Genetics to Your Environment, Tri-State Cow/calf Symposium, Wray, CO,Date: 01/03/2009
9. Fitting Beef Genetics to Your Environment, Farmers and Ranchers Cow/calf College,Date: 01/20/2009
10. Value of Improving Accuracy of Yearling Bulls, National Beef Cattle Evaluation Consortium Meeting on Use of DNA Testing in Beef Cattle, Date: 06/22/2009
11. Carcass EPDs, Ultrasound Guidelines Council Educational Program, Date: 06/24/2009
12. Genetics Tools and Trends In Beef Cattle, Nebraska Gelbvieh Association Annual Meeting, Date: 12/11/2010
13. Use of Molecular Information for Complex Traits, Red Angus Association of America Brain Trust Meeting, Denver, CO,Date: 01/10/2010
14. Production and/or Profit? Selection for Profitable Genetics Not Just High Production Genetics, Beef Improvement Federation Annual Meeting, Date: 06/29/2010
15. Genetic Evaluation for Reproductive Traits, Beef Improvement Federation Annual Meeting,Date: 06/30/2010
16. Genetic Change and New Ways to Get There, NE Gelbvieh Field Day, Date: 09/11/2010
17. Genomics in the Beef Industry, Iowa State Extension In-Service, Date: 10/27/2010
18. Beef Cattle Genetics, Nebraska Youth Beef Leadership Symposium, Date: 11/20/2010
19. The many measures of accuracy: How are they related? National Beef Cattle Evaluation Consortium Webinar, Date: 10/20/2010
20. Beef Sire Selection Principles, Nebraska Ranch Practicum, Date: 11/04/2010
21. Genomics: Current realities and future promises, American Gelbvieh Association, Annual Convention in Denver, CO, Date: 01/07/2011
22. Information Overload: Helping your customers buy the right bulls, American Gelbvieh Association, Annual Convention, Denver, CO, Date: 01/07/2011
23. Integration of genomic information into genetic evaluation, National Cattlemens Beef Association, Cattlemens College, Denver, CO, Date: 02/02/2011
24. Improving Feed Efficiency Through Genetics, Wisconsin Cattlemens, Annual Convention, Wisconsin Dells, WI, Date: 02/11/2011
25. Benefits of Integrating Genomic Information into EPD, American International Charolais Association, Annual Board Meeting, Kansas City, MO, Date: 03/27/2011
26. Integrating molecular information into NCE: Expectations, benefits and needs, Beef Improvement Federation, Annual Convention, Bozeman, MT, Date: 06/03/2011
27. A paradigm shift: Genomic predictions of beef cattle, Accelerated Genetics, Regional Annual Meeting, Lincoln, NE, Date: 07/20/2011
28. Beef Industry Genetic Trends and Lessons, Mississippi and Alabama Extension, Genetics Learn at Lunch webinar series, Date: 09/27/2011
29. Validation of genomic predictions within and across breeds, NCERA-199, Annual Meeting, Kansas City, MO. Date: 10/21/2011
30. Marker Assisted Selection and the Weight Trait Project, American Hereford Association, Annual Board Meeting, Kansas City, MO Date: 10/28/2011

31. Improving the Genetics of Feed Efficiency, Nevada Cattlemens Association, Annual Convention, Gardnerville, NV, Date: 11/15/2011
32. Genomic Predictions in Beef Cattle: Benefits and Cautions, California Cattlemens Association, Annual Convention, Reno, NV, Date: 11/16/2011
33. Implementation of Marker-Assisted EPDs, Range Beef Cow Symposium, Mitchell, NE, Date: 11/30/2011
34. Gudmendson Sandhills Labratory Cattlemens Day: Optimizing Genetic Potential of Cows in the Sandhills Date: 01/26/2011
35. Women in Agriculture: Genetics of Beef Cattle-Moving to the genomics era Date: 02/18/2011
36. Nebraska College of Technical Agriculture Cow/calf College: Building the Perfect Cow Date: 05/12/2011
37. Nebraska Youth Beef Leadership Symposium: Genetics of Beef Cattle Date: 11/19/2011
38. UNL Beef Satellite Short Course: Optimizing Cow Size and Matching Genetics with Resources Date: 01/20/2011
39. eXtension Webinar: Genetic Selection to Optimize Cow Size Date: 02/28/2011
40. Selection for Improved Feed Efficiency: A Genomics Approach, National Cattlemens Beef Association, Cattlemens College, Nashville, TN, Date: 02/2012
41. Selection for Improved Feed Efficiency: A Genomics Approach, Youth Beef Industry Congress, Nashville, TN, Date: 02/2012
42. Industry Views of Adoption of Genomics, Beef Improvement Federation,Annual Convention, Houston, TX, Date: 04/2012
43. Breed differences in growth and maturity, Brazilian Beef Shortcourse, Lincoln, NE, Date: 04/2012
44. Incorporating DNA Information Into EPDs for Angus Cattle and Potential for Other Breeds, Reciprocal Meats Conference, Fargo, ND, Date: 06/2013
45. Current Use and Expectations about the Realistic Application of Genomics in Animal Breeding Programs, 9th Symposium of the Brazilian Society of Animal Breeding, Joao Pessoa, Brazil, Date: 06/2012
46. Marker-Assisted EPD for Other Breeds: A Changing Paradigm, DNA technology in beef cattle, where we are, where we've been, and where we're going, Clay Center, NE, Date: 06/2012
47. Genomics and the Rancher, Cow/calf Conference, Springfield, TN, Date: 10/2012
48. Genetic improvement of feed efficiency: Tools and tactics, Nebraska Cattlemens Convention, Kearney, NE, Date: 12/2012
49. Genetic selection for improved feed efficiency, 4 State Beef Conference, Beatrice, NE, Date: 01/2013
50. Selection for improved feed efficiency, Driftless Region Conference, Dubuque, IA, Date: 01/2013
51. Give it to me straight before I get cross: Benefits of crossbreeding, Driftless Region Conference, Dubuque, IA, Date: 01/2013
52. Crossbreeding-One of the Tools to Increase Profitability. Beef Improvement Federation Annual Convention, Oklahoma City, OK. 2013.
53. Current State of Integrating Genomics Into National Cattle Evaluation. DNA In Beef Cattle: where we've been, where we're at, and where we're going, Clay Center, NE. 2013
54. Genomic Predictors of Feed Efficiency. DNA In Beef Cattle: where we've been, where we're at, and where we're going, Clay Center, NE. 2013.

55. Introduction to DNA Testing in Beef Cattle. South Dakota Seedstock Symposium, Sioux Falls, SD. 2013.
56. Strengths and Weaknesses of Methods of Incorporating Genomics into Genetic Evaluation. Beef Improvement Federation Genetic Prediction Workshop, Kansas City, MO. 2013.
57. Adoption of Genomics: Extending Science to an Industry. Transatlantic conference, Lincoln, NE. 2013.
58. Beef Cattle Genomics: Current Status and Future Directions. Select Sires Annual Sales Conference, Columbus, OH. 2013.
59. Genetic Improvement for Forage Use. Oklahoma Master Cattlemen Summit, Stillwater, OK. 2013.
60. From Discovery to Application: A Genomics Story. Oklahoma State University Animal Science Seminar, Stillwater, OK. 2013.
61. The Weight Trait Project: What We've Learned. Illinois Charolais Field Day, Champaign, IL. 2013.
62. Beef Sire Selection Using Genomics: Current State and Future Goals. Genex Annual Delegate Meeting, MN. 2013.
63. Beef Cattle Efficiency: Definitions and Improvement Strategies. Angus Boot Camp, Clemson, SC. 2013.
64. Improving Feedlot Performance: Feed Efficiency Grant Update. National Beef Cattle Evaluation Consortium Brown Bagger Webinar. 2013.
65. National Program for the Genetic Improvement of Feed Efficiency in Beef Cattle: Aims and Current Results. Beef Improvement Federation Annual Convention, Oklahoma City, OK. 2013.
66. It's In Their Genes! Angus Raising the Bar Conference, Lincoln, NE. 2013.
67. Straightbred vs Crossbred. Florida Cattlemens Institute and Trade Show, Arcadia, FL. 2014.
68. Exploratory Analysis of Genetic Variants Underlying Body Temperature in Beef Cattle. Plant and Animal Genome Conference, San Diego, CA. 2014.
69. Genetic considerations for the cowherd, Ranch Practicum, North Platte, NE. 2014.
70. Advancements in genetic selection tools: Tackling efficiency, Western NE Cattlemens Affiliate, Scottsbluff, NE. 2014.
71. Using genomics to pick the high hanging fruit: Integrated projects update. Beef Improvement Federation meeting, Lincoln, NE. 2014.
72. Tools to use when selecting Red Angus bulls, NE Red Angus Field Day, Kearney, NE 2014.
73. Crossbreeding talks in 2014: Why they're still needed. American Simmental Educational Symposium, Bozeman, MT. 2014.
74. Does Scrotal Circumference Impact Female Fertility?. Applied Reproductive Strategies in Beef Cattle, Stillwater, OK. 2014.
75. Terminal and Maternal Breeding Programs. State of Beef Conference, North Platte, NE. 2014.
76. Filling the Knowledge Gap: Integrating Quantitative Genetics and Genomics in Graduate Education and Outreach. 10th World Congress on Genetics Applied to Livestock Production, Vancouver, CA, 2014.
77. Using EPDs: A prospective for commercial cattlemen. Husker Harvest Days, Kearney, NE, 2014.

78. What is imputation and why is it important? National Beef Cattle Evaluation Consortium Brown Bagger Webinar Series, 2014.
79. Panel Discussion: Preparing for the next 20 years in the seedstock industry, Allied Genetic Resources meeting, Bozeman, MT, 2014.
80. Emerging Selection Technologies, Beefmaster Breeders United annual convention, Memphis, TN, 2014.
81. Selection Indexes and Genomics, Beefmaster Breeders United annual board meeting, Memphis, TN, 2014.
82. Genetic Markers, Nebraska Youth Beef Leadership Symposium, Lincoln, NE, 2014.
83. Genomic Selection in Beef: A model for industry partnership. USDA-NIFA Sheep Genomics Workshop, Lincoln, NE 2014.
84. Genetic Considerations and Use of Technology. Hui Shan Beef Symposium, Kearney, NE, 2014.
85. Terminal and Maternal Breeding Systems: Challenges and opportunities. Nebraska Cattlemen Cattlemens College, Kearney, NE, 2014.
86. Maternal Breeding Programs. Nebraska Cattlemen Convention, Seedstock Council, Kearney, NE, 2014.
87. Genetic Selection Tools In Beef Cattle. North Central Ag. Progress Show, Atkinson, NE 2014.
88. Growing The Cowherd With Red Angus Germplasm. Red Angus BrainTrust, Denver, CO, 2015.
89. Sensitivity to Temperature Variation in Beef Cattle: Opportunities and Challenges for Selection. Plant and Animal Genome Conference, San Diego, CA, 2015.
90. Rebuilding Your Herd—Terminal and Maternal Breeding Programs. Cow/calf College, Clay Center, NE, 2015.
91. The Future of Genetic Selection: Genetics to Fit Differing Environments. National Cattlemens Beef Association Cattlemens College, San Antonio, TX, 2015.
92. Technologies for Beef Cattle Selection: Old and New. Nebraska Cattlemen Affiliate Meeting, Bridgeport, NE, 2015.
93. Harvesters of Grass: The Genes Make a Difference. UNL OLLIE series, Lincoln, NE, 2015.
94. Genetic Principles. Maddux Ranch Meeting, Wauneta, NE, 2015.
95. Crossbreeding: The Science Behind It. Wulf Cattle Pre-Sale Seminar, Morris, MN, 2015.
96. Genetic Selection Tools In Beef Cattle: Economic Indexes. UNL Beef Webinar, Lincoln, NE, 2015.
97. Genetic Selection Tools In Beef Cattle: EPDs and Antagonisms. UNL Beef Webinar, Lincoln, NE, 2015.
98. From Discovery to Application: A Genomics Story. UNL Department of Animal Science Seminar, Lincoln, NE, 2015.
99. BIF Feed Intake Guidelines Revision—Challenges. Beef Improvement Federation Annual Research Symposium, Biloxi, MS, 2015.
100. Efforts in Developing Decision Support Software for the Beef Industry. Beef Improvement Federation Annual Research Symposium, Biloxi, MS, 2015.
101. Improving the Ability to Utilize Multiple Breeds in Commercial Beef Production: Breed Specific Heterosis and Across Breed Calving Ease EPD Adjustment Factors. Beef Improvement Federation Annual Research Symposium, Biloxi, MS, 2015.

102. Quantitative Genetics and Genomics Research at UNL: Discovery and Application. ESALQ Graduate Students, Piracicaba, Brazil, 2015.
103. Beef Cattle Genetics. Chadron State Study Tour, North Platte, NE, 2015.
104. History of Beef Improvement. GSL Open House, Whitman, NE, 2015.
105. Futuristic View of the Beef Industry From Seedstock Producers (panel moderator). GSL Open House, Whitman, NE, 2015.
106. Emerging Beef Selection Tools. Schuler Customer Appreciation Event, Redington, NE, 2015.
107. EPDs, Genomics, and How the Beef Industry is Taking Part. Serbia Cockran Scholars, Lincoln, NE, 2015.
108. Genomics Update. Select Sires Beef Committee Meeting, Columbus, OH, 2015.
109. Genetic Selection for Improved Feed Efficiency in Beef Cattle. DNA Technology in Beef Cattle: Where we've been, where we are, and where we're headed, Clay Center, NE, 2015.
110. Summary of Take Home Points. DNA Technology in Beef Cattle: Where we've been, where we are, and where we're headed, Clay Center, NE, 2015.
111. The Weight Trait Project: Review and a Look Forward. Annual Weight Trait Project Meeting, Clay Center, NE, 2015.
112. Status update on genomically enhanced genetic evaluations by breeds. National Beef Cattle Evaluation Consortium Brown Bagger Webinar Series, 2015.
113. Genetic considerations for the cowherd. Ranch Practicum, Whitman, NE, 2015.
114. Economically relevant traits and selection indices. Range Beef Cow Symposium, Loveland, CO, 2015.
115. New trends and technologies in genetic selection. Shorthorn Impact Conference, Kansas City, MO, 2015.
116. State of the art in modeling GE-EPDs. Neogen GeneSeek Innovation Seminar, Lincoln, NE, 2015.
117. Nebraska Beef Industry Scholars: preparing the next generation of beef producers. Daweson County Cattlemen's meeting, Cozad, NE, 2016.
118. How are we incorporating efficiency data into todays management decisions. Kentucky Cattlemens meeting, Owensboro, KY, 2016.
119. Beef cattle genetics 101. Morrill County Cattlemens meeting, Bridgeport, NE, 2016.
120. Application of advanced genetic technology in beef cattle. B.K. "Kley" Johnson Lectureship on Current Ranching Issues, King Ranch Institute for Ranch Management, Kingsville, TX, 2016.
121. Selection indexes: Understanding how to use them now and in the future. Beef and Beyond, Champaign, IL, 2016.
122. Genomic-enhanced EPD. Beef and Beyond, Champaign, IL, 2016.
123. Harvesters of Grass: The Genes Make a Difference. UNL OLLIE series, Lincoln, NE, 2016.
124. Genomic-enhanced EPD. Salers board meeting, Lincoln, NE, 2016.
125. Genetic tools for improved performance. Purina Sale Conference, Sioux Falls, SD, 2016.
126. Quantitative Genetics and Genomics Shortcourse, Piricicaba, Brazil, 2016.
127. Nebraska Beef Industry Scholars update. Nebraska cattlemen Midyear meeting, Broken Bow, NE, 2016.
128. Extension demonstration project outcomes: Industry adoption and translation of project deliverables. Beef Improvement Federation annual meeting, Manhattan, KS, 2016.

129. Protecting producer profit for the future (panel moderator). Beef Improvement Federation annual meeting, Manhattan, KS, 2016.
130. Traditional genetic selection for fertility: indicator traits and potential antagonisms. Applied Reproductive Strategies in Beef Cattle, Des Moines, IA, 2016.
131. Current Status of Genomic Selection in the U.S. Beef Industry. DNA In Beef Cattle: where we've been, where we're at, and where we're going, Clay Center, NE, 2016.
132. Genetic selection for more profitable cow/calf enterprises: tackling input costs. State of Beef Conference, North Platte, NE, 2016.
133. Beef Cattle Genetics and Genomics. Argentina Visitors, Lincoln, NE, 2016.
134. Updates on Genomic Research. Powerline Genetics group, Lincoln, NE, 2016.
135. Beef Cattle Genetics, Kazahkstan Delegation, Lincoln, NE, 2016.
136. Applied Beef Cattle Genetics, Argentina Visitors, Lincoln, NE, 2016.
137. Genomic Selection: helping commercial producers. Salers Genetic Summit, Bismarck, ND, 2016.
138. Beef Cattle Genetics, Argentina Visitors, Lincoln, NE, 2016.
139. Practical Lessons Learned from Performing Training and Evaluation. DNA In Beef Cattle: where we've been, where we're at, and where we're going, Clay Center, NE, 2016.
140. Benefits and Current Limitations of Multi-breed National Cattle Evaluation. National Beef Cattle Evaluation Consortium Brown Bagger Webinar Series, 2016.
141. New Trait Development. Beefmaster board of directors meeting, Branson, MO, 2016.
142. EPDs and Selection Indices. Beefmaster Annual Convention, Branson, MO, 2016.
143. Genetic Considerations for the Cowherd. UNL Ranch Practicum, Whitman, NE, 2016.
144. Improving profitability and mitigating risk: Indices and Genomics. ABS Regional sale meeting, North Platte, NE, 2016.
145. Agrogenomics panel. Illumina Stakeholder meeting, Chicago, IL, 2016.
146. Improving profit through informed bull buying, American Gelbvieh Association annual meeting, Lincoln, NE, 2016.
147. The Weight Trait Project, American Gelbvieh Association board meeting, Lincoln, NE, 2016.
148. Selection for improved female efficiency and fertility. Nebraska Cattlemen Cattlemens College, Kearney, NE, 2016.
149. Using EPDs and indexes to produce more profitable feedlot cattle. American Junior Simmental Association webinar, 2017.
150. Setting up base camp—DNA by the numbers, what do they really mean? Red Angus Brain Trust, Denver, CO, 2017.
151. Advancing sire selection tools. Hunt Limousin Customer Appreciation event, Oxford, NE, 2017.
152. Selection to improve carcass traits. Otoe-Cass Cattlemens Affiliate, Syracuse, NE, 2017.
153. Profit focused genetic selection decisions. Women in Ag. Conference, Kearney, NE, 2017.
154. Understanding advancements in beef cattle selection tools. National Cattlemens Beef Association webinar, 2017.
155. Genomic EPD and multi-breed evaluations. American Gelbvieh Association Board Meeting, Denver, CO, 2017.
156. Using genomics to affect cowherd reproduction. Florida beef cattle shortcourse, Gainesville, FL, 2017.
157. Application of advanced genetic technology in beef cattle. King Ranch Institute for Ranch Management, Bozeman, MT, 2017.

158. Application of advanced genetic technology in beef cattle. King Ranch Institute for Ranch Management, Rapid City, SD, 2017.
159. Where We Are Going with Genomics and Genetic Improvement. Beef Improvement Federation Annual meeting, Athens, GA, 2017.
160. Implications of multi-breed evaluations and across-breed EPDs for commercial producers. Beef Improvement Federation Annual meeting, Athens, GA, 2017.
161. Considerations for adjusting carcass traits to differing endpoints. Beef Improvement Federation Annual meeting, Athens, GA, 2017.
162. Applied beef genetics: reminders and updates. Quinn Cow Company Beef Summit, Clay Center, NE, 2017.
163. Beef Cattle Research and Teaching in Eastern Nebraska. ENREC Open House, Ithica, NE, 2017.
164. Genetic Selection Tools Used in the U.S. beef Industry, Argentina Seedstock Tour, Lincoln, NE, 2017.
165. A Crash Course in Beef Cattle Genetics. International Genetics Solutions Youth Symposium, Lincoln, NE, 2017.
166. Genomics: Putting Theory Into Practice For Commercial Cattle Producers. Canadian Beef Industry Conference, Calgary, Canada, 2017.
167. Recent Advances and Applications in Animal Breeding and Genetics. Canadian Beef Industry Conference Technical Forum, Calgary, Canada, 2017.
168. Genetic Considerations for the Cowherd. Midwest Beef Symposium, Owensboro, KY, 2017.
169. Sire Selection Tools. Traunicht Simmental Customer Appreciation Event, Wymore, NE, 2017.
170. Mootopia: An Animal Breeders Vision for the Beef Industry, International Genetics Solutions Focus meeting, Bismarck, ND, 2017.
171. How to get the most out of genomic selection, DNA In Beef Cattle: where we've been, where we're at, and where we're going, Clay Center, NE, 2017.
172. Genetic considerations for the cowherd, Nebraska Ranch Practicum, Whitman, NE, 2017.
173. From big data to better solutions, Growing Nebraska Summit, Lincoln, NE, 2017.
174. Genetic selection vs visual appraisal: Is it a conundrum? Range Beef Cow Symposium XXV, Cheyenne, WY, 2017.
175. Fake news: EPDs don't work. National Cattlemens Beef Association webinar. 2018
176. Use of genomic-enhanced EPDs to improve beef quality, Cattlemens workshop, La Grande, OR, 2018.
177. Bull selection—balancing EPDs, genomics, indexes, performance and structure, National Cattlemens Beef Association Cattlemens College, Phoenix, AZ, 2018.
178. Genetic technologies on the horizon, National Cattlemens Beef Association Cattlemens College, Phoenix, AZ, 2018.
179. Application of advanced genetic technology in beef cattle. King Ranch Institute for Ranch Management, Kissimmee, FL, 2018.
180. Current trends in beef cattle genetic evaluation. Midwest American Society of Animal Science meetings, Omaha, NE, 2018.
181. Genomic selection: Practical lessons learned and mistakes made. Iowa State University Animal Science departmental seminar, Ames, IA, 2018.
182. American Hereford Association Board Discussion: Current and future genetic selection tools, Kansas City, MO, 2018.

183. Putting the tools to use: Selecting your next bull. National Cattlemens Beef Association webinar. 2018
184. Quantitative genetics/genomics research at the University of Nebraska-Lincoln, Departmental seminar, Pirassununga, Brazil. 2018.
185. Impact of single-step on selection indices, Beef Improvement Federation annual meetings, Loveland, CO, 2018
186. Bull selection workshop, Beef Improvement Federation annual meetings, Loveland, CO, 2018
187. Genomic selection: Historical perspective and development of methods in use today, American Society of Animal Science annual meetings, Vancouver, BC, CA, 2018.
188. Big data = better beef, Agricultural Economic and Technology summit, Kearney, NE, 2018.
189. Use of genomics in bovine genetic selection and utilization of genomics in other ag sectors, American Association of Bovine Practitioners webinar, 2018.
190. EPDs and the use of genomics in beef cattle selection, ABS Global South American Tour, Lincoln, NE, 2018.
191. Genetic Selection Tools Used in the U.S. beef Industry, Argentina Seedstock Tour, Lincoln, NE, 2018
192. Ask Not what your NCE can do you for, ask what you can do for your NCE, American Simmental Association Fall Focus, Bozeman, MT, 2018.
193. New International Genetic Solutions genetic evaluation (Panel discussion), Allied Genetic Resources meeting, Bozeman, MT, 2018.
194. Extension in Animal Science, UNL Animal Science departmental seminar, Lincoln, NE, 2018.
195. Breed differences for growth and carcass traits, Brazil Cochran scholars, Lincoln, NE, 2018.
196. Using genomics and genomically enhanced EPDs in your cow-calf operation, University of WI extension webinar, 2018.
197. The role of Brahman in crossbreeding and the beef industry, V8 ranch workshop, Wharton, TX, 2018.
198. Genetic selection principles, American Akaushi convention, San Marcos, TX, 2018.
199. Beef cattle genetics, Kasakstan delegation, Lincoln, NE, 2018.
200. Selection indexes 101 and beyond, National Beef Cattle Evaluation Consortium Brown Bagger webinar series, 2018.
201. $Indexes 101, American Angus Association annual Convention, Columbus, OH, 2018.
202. Genetic selection for efficiency, State of Beef Conference, North Platte, NE, 2018.
203. Genetic considerations for the cowherd, NE Ranch Practicum, Whitman, NE 2018 (via distance).
204. Past, present, and future approaches to genomic selection, Bair Ranch technical lecture, Montana State University, Bozeman, MT, 2018.
205. Genetic selection of livestock: Why it matters to you, Bair Ranch community lecture, Montana State University, Bozeman, MT, 2018.
206. Decision support using customizable indices across breeds, Beef Improvement Federation Genetic Prediction Workshop, Kansas City, MO, 2018.
207. US national beef cattle single step genomic evaluations, Plant and Animal Genome meeting, San Diego, CA, 2019.
208. Using genomics to improve cattle: Now and in the future. Saskatchewan Beef Industry Conference, Regina, Canada, 2019.

209. Bull selection and breeding tools, Nebraska Cattlemen Lancaster/Seward Affiliate meeting, Milford, NE, 2019.
210. History and status of genomics for ranchers, Cow-calf Symposium for Southwestern Ranchers, Phoenix, AZ, 2019.
211. Bull selection for large, arid, and sparse feed ranches, Cow-calf Symposium for Southwestern Ranchers, Phoenix, AZ, 2019.
212. Genetic selection of beef cattle: Past, present, and future. Nuffeld Contemporary Scholars Conference, Ames, IA, 2019.
213. Application of advanced genetic technology in beef cattle. King Ranch Institute for Ranch Management, Denver, CO, 2019.
214. Development of a web-based sire selection tool, Beef Improvement Federation annual meetings, Brookings, SD, 2019.
215. Decision support using customizable indices across breeds, Beef Improvement Federation annual meetings, Brookings, SD, 2019.
216. Getting the most from our selection tools: Decision Support, Beef Improvement Federation annual meetings, Brookings, SD, 2019.
217. Guidelines For Uniform Beef Improvement Wiki, Beef Improvement Federation annual meetings, Brookings, SD, 2019.
218. Genetic Selection 101, American Dexter Association annual meeting, Lincoln, NE, 2019.
219. Beef cattle genetics, Kasakstan visitors, Lincoln, NE, 2019
220. Evolving genetic selection tools in beef cattle, Texas A&M beef cattle shortcourse, College Station, TX, 2019.
221. The current state of beef cattle genomics and the future, Select Sires annual sales conference, Columbus, OH, 2019.
222. Genomics and the beef industry: Missing links, American Association of Bovine Practitioners, St. Louis, MO, 2019.
223. Advice to IGS and its partners for continued success, International Genetics Solutions Partner meeting, Bozeman, MT, 2019.
224. Nebraska Integrated Beef Systems Initiative (NIBSI) Genomics Program, NIBSI Summit, Lincoln, NE, 2019.
225. Nebraska Integrated Beef Systems Initiative (NIBSI) Genomics Program, Feedlot stakeholder group, Lincoln, NE, 2019.
226. Nebraska Integrated Beef Systems Initiative (NIBSI) Genomics Program, cow-calf stakeholder group, North Platte, NE, 2019.
227. Nebraska Integrated Beef Systems Initiative (NIBSI) Genomics Program, cow-calf stakeholder group, Broken Bow, NE, 2019.
228. Genetic considerations for the cowherd, Nebraska Ranch Practicum (via webinar), North Platte, NE, 2020.
229. Science on Screen, Panelist for “Cowboys” documentary, Scottsbluff, NE, 2020.
230. Advances in genetic prediction and the potential benefits to non-geneticists, Panhandle Research and Extension Center seminar, Scottsbluff, NE, 2020.
231. Application of advanced genetic technology in beef cattle. King Ranch Institute for Ranch Management, Kingsville, TX, 2020.
232. Making the best use of current genetic selection tools, NCBA webinar, 2020.
233. Keeping your genetic decisions between the ditches: Breeding objectives, Beef Profit Tips Workshop, West Point, NE, 2020.
234. A discussion on selection indexes, American Hereford Association Board of Directors Meeting (virtual), 2020.

235. iGENEC: A tool for web-based sire selection decisions, Beef Improvement Federation Annual Convention (virtual), 2020.
236. A discussion on genetic evaluations and selection, Allied Genetic Resources member meeting, Lexington, NE (participated virtually), 2020.
237. Cattle breeds and selection basics. On The Farm Genetics and Heredity Professional Development for High School Teachers (Livestream), 2020.
238. Advancing beef genetics—Genomics, AI, and more. UNLExtension Ag. Technology Issue Team Webinar Series, 2020.
239. Making the sire selection process simpler: A web-based decision support tool (iGENDEC). National Beef Cattle Evaluation Consortium Brown Bagger Webinar Series, 2020.
240. The importance of phenotypes in a genomic world. American Wagyu Association Convention (virtual), 2020.
241. Bull Selection. UNL BeefWatch Webinar Series, 2020.
242. Sorting through the bull: Systems and Selection, Better with Beef Happy Hour webinar series, hosted by Colorado State University, 2021.
243. Making the best of the data we have to improve the accuracy of genomic predictions, University of Florida Animal Breeding and Genetics seminar (virtual), 2021.
244. Application of advanced genetic technology in beef cattle. King Ranch Institute for Ranch Management (virtual), 2021.
245. A discussion on 'optimums', Angus Genetics Inc. board meeting, Nebraska City, NE, 2021.
246. Animal genetics, Lincoln public school summer institute workshop, Lincoln, NE, 2021.
247. Genetic technology in beef cattle, H-Calf webinar series (Houston Livestock Show and Rodeo Educational Program), 2021.
248. The future role of genomics and genetic evaluations in the beef industry, Select Sires strategic planning meeting, Nebraska City, NE, 2021.
249. Proposed Guideline Revisions for Contemporary Groups, Beef Improvement Federation annual symposium, Des Moines, IA, 2021.
250. Understand the Value of Accuracy, Beef Improvement Federation annual symposium, Des Moines, IA, 2021.
251. An Update and Demonstration of iGENDEC, Beef Improvement Federation annual symposium, Des Moines, IA, 2021.
252. Practical Examples of machine Learning in Animal Breeding, Beef Improvement Federation annual symposium, Des Moines, IA, 2021.
253. Cattle breeds and selection basics. On The Farm Genetics and Heredity Professional Development for High School Teachers (Livestream), 2021.
254. Practical Uses of Genomics for Ranchers, Cattle U and Trade Show, Dodge City, KS, 2021.
255. Genetic considerations for the cowherd, Nebraska Ranch Practicum (via webinar), Whitman, NE, 2021.
256. An Update on and Demonstration of iGENDEC, Cattlemens College, National Cattlemens Beef Association, Nashville, TN, 2021.
257. What Lies Ahead: Genetics and Genomics, American Gelbvieh Association Board of Directors Meeting (virtual), 2021.
258. Genetics Considerations in Heifer Development, American Association of Bovine Practitioners Workshop, Salt Lake City, UT, 2021.

259. Genomics: Industry Use, State of Play, and the UNL Framework, Nebraska Integrated Beef Systems Summit, Lincoln, NE, 2021.
260. Considerations for Selecting U.S. Genetics, NE/KS Dept. of Agriculture Chilean trade talks (virtual), 2021.
261. An Introduction to iGENDEC, North American Limousin Foundation Breed Improvement Committee (virtual), 2021.
262. An Introduction to iGENDEC, North American Limousin Foundation Board of Directors meeting (virtual), 2021
263. Historical perspective of cattle genetics—A timeline of understanding and using techniques for herd improvement. Herd Improvement and Bull Selection (A symposium for commercial western ranchers), Mesa, AZ, 2022.
264. Application of advanced genetic technology in beef cattle. King Ranch Institute for Ranch Management, Kingsville, TX, 2022.
265. Buying herd bulls. Cass/Otoe County Cattlemen Beef Info Meeting, Syracuse, NE, 2022.
266. A demonstration of iGENDEC and Primer of Selection Indexes, UNL Extension Educator Training (virtual), 2022.
267. Beef Genetics in the U.S., Indian National Ag Higher Education Project, Scottsbluff, NE, 2022.
268. Putting the bits together: Decision support software, UNL Animal Breeding and Genetics seminar, Lincoln, NE 2022.
269. iGENDEC—Next Generation decision support, Beef Improvement Federation annual symposia, Las Cruces, NM, 2022.
270. Contemplating planning horizon length in constructing economically optimal selection indexes, Beef Improvement Federation annual symposia, Las Cruces, NM, 2022.
271. Relationship between mitochondrial DNA and growth/carcass traits in beef cattle (co-with L. Sanglard), Beef Improvement Federation annual symposia, Las Cruces, NM, 2022.
272. Beef cattle genetics within Nebraska and the U.S., Argentine producer group, Lincoln, NE, 2022.
273. An introduction to iGENDEC, Fast Genetics Innovation Hour (virtual), 2022.
274. An Animal Breeders View Of Under-Utilized Tools To Improve Fertility In Beef Herds, Applied Reproductive Strategies in Beef Cattle, San Antonio, TX, 2022.
275. Genetic Considerations for the Cowherd, UNL Ranch Practicum (online), 2022.
276. Understanding DNA and It's Role in Pedigrees, EPDs and Selection, Brahman Days, Boling, TX, 2022.
277. National Ag. Producer Data Cooperative, CAIA webinar series, 2022
278. Genomics and EPDs—Helping Your Bull Buyers Understand Them, Nebraska Cattlemens Convention, Kearney, NE, 2022.
279. Understanding and Then Using EPD, NE Farm Bureau webinar series, 2022.
280. Value of Genetic Data Beyond Seedstock and Geneticists, UNL Beef Group meeting, Lincoln, NE, 2023.
281. Why Genotype? National Salers Show and Sale, Oklahoma City, OK, 2023.
282. Genomic EPDs, Eastern NE Cattle Conference, Syracuse, NE, 2023.
283. Impact of Genomics on EPDs (panelist), Cattlemens Conference—Blueprint for the Future, Stillwater, OK, 2023.
284. Utilizing U.S. Beef Cattle Genetics to Improve Quality in Mexican Beef: A Case Study from Nebraska (given by interpreter), International Meat Congress, Leon, Guanajuato, Mexico, 2023.

285. Genetic Selection for Enterprise Profit, American Simmental Association STYLE Conference, Oklahoma City, OK, 2023.
286. Genetic selection for improved profit conditioned on enterprise-specific circumstances, American Society of Animal Science meetings (Invited), Albuquerque, NM, 2023.
287. Tools for selecting U.S. beef genetics, Argentine trade group, Lincoln, NE, 2023.
288. Genetic considerations for the cowherd, UNL Ranch practicum (virtual), 2023.
289. Genomics: Improving the U.S. Cowherd, American Gelbvieh Association webinar series (virtual), 2023.
290. iGENDEC—Next generation decision support, Wulf/Riverview webinar (virtual), 2023.
291. Current and Future Use of Genomics in Beef Cattle, Iowa Vet Med Association annual meeting, Ames, IA, 2023.
292. Profit Focused? Make Sure Your Selection Decisions Are Too, NBCEC Brown Bagger webinar series (virtual), 2023.
293. Here in the middle with you: modern quantitative animal genetics, Complex Biosystems seminar, Lincoln, NE, 2023.
294. Impacting the Quality of EPDs for You and Your Customers, Beef Seedstock Symposium, Lexington, KY, 2023.
295. Putting Selection Tools to Work (EPDs and Indices), Beef Seedstock Symposium, Lexington, KY, 2023.
296. Impacting the Quality of EPDs for You and Your Customers, Beef Seedstock Symposium, Glasgow, KY, 2023.
297. Putting Selection Tools to Work (EPDs and Indices), Beef Seedstock Symposium, Glasgow, KY, 2023.
298. Impacting the Quality of EPDs for You and Your Customers, Beef Seedstock Symposium, Spring Hill, TN, 2023.
299. Putting Selection Tools to Work (EPDs and Indices), Beef Seedstock Symposium, Spring Hill, TN, 2023.
300. A Genetics Primer and Vision for Fed Cattle Phenotypic Prediction and Data Utilization, Genetic Merit Pricing Task Force meeting (w/ Larry Kuehn), Denver, CO, 2023
301. Genetic tools for the cow/calf producer (panel moderator), Nebraska Beef Industry Scholars Beef Summit, Mead, NE, 2023
302. Demonstration of iGENDEC, Neogen Genetic Evaluation Team meeting, Lincoln, NE 2023.
303. Making genetic progress and why end product quality matters to Seedstock producers, American Gelbvieh Association annual convention, Omaha, NE, 2023.
304. Increasing the accuracy of selection decisions, ISU Genetics Symposium, Ames, IA, 2023.
305. Leveraging commercial data to improve selection and management decisions, BIF Genetic Prediction Workshop, Kansas City, MO, 2023.
306. iGENDEC—Building breed association indexes, American International Charolais Association breed improvement committee (virtual), 2024.
307. Application of advanced genetic technology in beef cattle. King Ranch Institute for Ranch Management, Forth Worth, TX, 2024
308. What's new in animal breeding and genetics?, UNL Block and Bridle meeting, Lincoln, NE, 2024.
309. Beef genetics research at UNL, USDA-ARS Beef Systems Research Strategy Planning Session, Ithaca, NE, 2024.

Proceeding Papers (non-reviewed) (since last promotion:7; career total:49)

1. **Spangler, M. L**. 2007. The value of heterosis in cow herds: lessons from the past that apply today. Proc. Range Beef Cow Symposium XX.
2. **Spangler, M. L.** 2009. Using Information to Make Informed Selection Decisions. Proc. Range Beef Cow Symposium.
3. **Spangler, M. L**. 2009. Use of DNA Technology in Beef Cattle Selection. Proc. Bovine Connection.
4. **Spangler, M. L**. 2009. Utilizing Genomic Information in Sire Selection. Proc. West Central Cattlemen's Field Day.
5. **Spangler, M. L**., and D. W. Moser. 2009. Real-time ultrasound: What does image quality mean to genetic evaluations. Proc. Annual Beef Improvement Federation Meeting.
6. **Spangler, M. L**. 2009. Fitting Genetics to Your Environment. Proc. Tri-State Cow/calf Symposium.
7. **Spangler, M. L**. 2009 Fitting Beef Genetics to Your Environment. Proc. Farmers and Ranchers Cow/calf College.
8. **Spangler, M.L**. 2010.Production (And) Or Profit? Focusing Our Breeding Objectives By Selecting For Profitable Genetics not Necessarily High Production Genetics. In Proc. Beef Improvement Federation Annual Conference.
9. **Spangler, M.L**. 2010. The need for marker assisted EPDs. In Proc. DNA Technology in Beef Cattle: Where we've been, where we are, and where we're going. Available at http://beef.unl.edu.
10. **Spangler, M.L**. 2010. Genetic Selection: New tools and advancing technology. In Proc. Ranching for Profitability.
11. **Spangler, M.L**. and A. Van Eenennaam. 2010. Utilizing DNA information in beef cattle selection. In Proc. New York Cattlemens' Annual Convention.
12. **Spangler, M.L**. 2011. Implementation of Marker Assisted EPDs. Proc. Range Beef Cow Symposium, Mitchell, NE.
13. **Spangler, M.L.** 2011. Realistic expectations of genomic selection. Proc. DNA In Beef Cattle: where we've been, where we're at, and where we're going, Clay Center, NE.
14. **Spangler, M.L.** 2011. The weight trait project: a year in review. Proc. DNA in beef cattle: where we've been, where we are, and where we're going, Clay center, NE.
15. **Spangler, M.L.** 2011. Integrating molecular information into NCE: Expectations, benefits, and needs. Proc. Beef Improvement Federation Annual Convention, Bozeman, MT.
16. **Spangler, M.L.** 2011. Integration of genomic information into genetic evaluation. Proc. National Cattlemens Beef Association Cattlemens College, Denver, CO.
17. **Spangler, M.** 2012. Incorporating DNA Information Into EPDs for Angus Cattle and Potential for Other Breeds. Proceedings of the Reciprocal Meats Conference
18. **Spangler, M.** 2012. Current Use and Expectations about the Realistic Application of Genomics in Animal Breeding Programs. Proceedings of the 9th Symposium of the Brazilian Society of Animal Breeding.
19. **Spangler, M.** 2012. Marker-Assisted EPD for Other Breeds: A Changing Paradigm. Proceedings: DNA technology in beef cattle, where we are, where we've been, and where we're going.

20. Bullock, D., Weaber, R., Van Eenennaam, A., and **Spangler, M.** 2012. National Beef Cattle Evaluation Consortium (NBCEC) White Paper - Delivering Genomics Technology to the Beef Industry. National Beef Cattle Evaluation Consortium and Beef Improvement Federation.
21. **Spangler, M.** 2013. Selection for improved feed efficiency. Proceedings: Driftless Region Conference, Dubuque, IA.
22. Weaber, R.L., and **M.L. Spangler**. 2013. Crossbreeding-One of the Tools to Increase Profitability. Proceedings: Beef Improvement Federation Annual Convention, Oklahoma City, OK.
23. **Spangler, M.L.** 2013. Current State of Integrating Genomics Into National Cattle Evaluation. Proceedings: DNA In Beef Cattle: where we've been, where we're at, and where we're going, Clay Center, NE.
24. **Spangler, M.L.** 2013. Genomic Predictors of Feed Efficiency. Proceedings: DNA In Beef Cattle: where we've been, where we're at, and where we're going, Clay Center, NE.
25. **Spangler, M.L.** 2013. Introduction to DNA Testing in Beef Cattle. Proceedings: South Dakota Seedstock Symposium, Sioux Falls, SD.
26. **Spangler, M.L.** 2013. Strengths and Weaknesses of Methods of Incorporating Genomics into Genetic Evaluation. Proceedings: Beef Improvement Federation Genetic Prediction Workshop, Kansas City, MO.
27. **Spangler, M.L.** and R. L. Weaber. 2014. Straightbred vs Crossbred. Proceedings: Florida Cattlemens Institute and Trade Show, Arcadia, FL.
28. Alhberg, C.M.,L. N. Schiermiester, and **M.L. Spangler**. 2014. Cholesterol and poly- and mono-unsaturated fatty acids, protein, and mineral content of beef: A genome wide association study using crossbred cattle. Proceedings: Beef Improvement Federation Annual Convention, Lincoln, NE.
29. Weaber, R.L., and **M.L. Spangler**. 2014. How DNA Testing Will Affect the Accuracy of EPD Information. Proceedings: Washington State University Beef Production Conference, Yakima, WA.
30. **Spangler, M.L.** 2014. Does Scrotal Circumference Impact Female Fertility?. Proceedings: Applied Reproductive Strategies in Beef Cattle, Stillwater, OK.
31. **Spangler, M.L.** 2014. Terminal and Maternal Breeding Programs. Proceedings: State of Beef Conference, North Platte, NE.
32. Weaber, R.L. and **M.L. Spangler**. 2015. The value and importance of using genomically enhanced EPD in beef cattle selection. In: Proc. Idaho Range Livestock Symposium. Idaho Falls, Burley, and Marsing, ID. University of Idaho Extension, Moscow, ID.
33. **Spangler, M.L.** 2015. Selection For Improved Feed Efficiency. Proceedings: DNA In Beef Cattle: where we've been, where we're at, and where we're going, Clay Center, NE.
34. **Spangler, M.L.** 2015. Economically relevant traits and selection indices. In: Proc. Range Beef Cow Symposium XXIV, Loveland, CO.
35. **Spangler, M.L.** 2016. Extension demonstration project outcomes: Industry adoption and translation of project deliverables. In Proc. Beef Improvement Federation Annual Convention, Manhattan, KS.
36. **Spangler, M.L.** 2016. Traditional genetic selection for fertility: indicator traits and potential antagonisms. In Proc. Applied Reproductive Strategies in Beef Cattle, Des Moines, IA.
37. **Spangler, M.L.** 2016. Current Status of Genomic Selection in the U.S. Beef Industry. Proceedings: DNA In Beef Cattle: where we've been, where we're at, and where we're going, Clay Center, NE.

38. **Spangler, M.L.** 2016. Genetic selection for more profitable cow/calf enterprises: tackling input costs. In Proc. State of Beef Conference, North Platte, NE.
39. **Spangler, M.L**. 2017. Using Genomics to Affect Cow Herd Reproduction. In Proc. Florida Beef Cattle Shortcourse, Gainesville, FL.
40. **Spangler, Matt,** and Alison Van Eenennaam. 2017. Where We Are Going with Genomics and Genetic Improvement. In Proc. Beef Improvement Federation Annual Convention, Athens, GA.
41. **Spangler, Matt.** 2017. How to get the most out of genomic selection. Proceedings: DNA In Beef Cattle: where we've been, where we're at, and where we're going, Clay Center, NE.
42. **Spangler, M.L.**, and R.L. Weaber. 2017. Genetic selection vs visual appraisal: Is it a conundrum? In: Proc. Range Beef Cow Symposium XXV, Cheyenne, WY.
43. **Spangler, M.L.** 2018. Use of genomics in bovine genetic selection and utilization of genomics in other ag sectors. American Association of Bovine Practitioners.
44. **Spangler, M.L.** 2018. Genetic Selection for Efficiency. In Proc. State of Beef Conference, North Platte, NE.
45. Golden, B.L., **M. L. Spangler**, W. M. Snelling, D. J. Garrick. 2018. Current single-step national beef cattle evaluation models used by the American Hereford Association and International Genetic Solutions, computational aspects, and implications of marker selection. Proc. Beef Improv. Fed. Genetic Prediction Workshop.
46. **Spangler, M.L**., B.L. Golden, L.A. Kuehn, W.M. Snelling, R.M. Thallman, R.L. Weaber. 2018. Decision support using customizable indices across breeds. Proc. Beef Improv. Fed. Genetic Prediction Workshop
47. **Spangler, M.L**. 2019. Genomics and the beef industry: Missing links. Proc. American Association of Bovine Practitioners, Vol. 52.
48. **Spangler, M.L.** 2022. An Animal Breeders View Of Under-Utilized Tools To Improve Fertility In Beef Herds. Proc. Applied Reproductive Strategies in Beef Cattle
49. **Spangler, M.L.** 2023. The impact of genomics on EPDs. Proc. Beef Cattle Congress—Blueprint for the Future.

Peer Reviewed Extension Publications (since last promotion: 5; career total:23)

1. **Spangler, M. L.** 2008. Economic Indexes for Beef Sire Selection, University of Nebraska NebGuide G1847.
2. **Spangler, M.L.** 2008. DNA Marker Tests for Beef Cattle. University of Nebraska NebGuide G1856.
3. **Spangler, M.L.** 2009. Beef Cattle Genetics. In Beef Basics II: Breeding for Profitability. UNL Extension Beef Home Study Shortcourse.
4. **Spangler, M. L.** 2009. Commercially Available DNA Tests for the Genetic Improvement of Beef Cattle, Revision. NebGuide G1856.
5. **Spangler, M. L.** 2009. The Basics of Expected Progeny Differences (EPDs) in the Beef Industry. NebGuide G1967.
6. **Spangler, M. L.,** and A. E. Van Eenennaam. 2010. Utilizing Molecular Information in Beef Cattle Selection. National Beef Cattle Evaluation Consortium Sire Selection Manual (2nd edition).
7. **Spangler, M.L.** 2011. Commercially available DNA tests for genetic improvement of

beef cattle. G1856 (Maj. Rev.).
8. **Spangler, M.L**. 2011. EPD basics and definitions. G1967 (Min. Rev.).
9. **Spangler, M.L.,** and D.L. Anderson. 2011. Genetic defects in beef cattle. G2055.
10. **Spangler, M.L.** and D.W. Moser. 2012. Genetics of Ultrasound. Ultrasound Guidelines Council Study Guide.
11. **Spangler, M. L.,** and L. Schiermiester 2013. Economic Indexes for Beef Sire Selection, University of Nebraska NebGuide G1847 (Minor Revision).
12. **Spangler, M. L.,** and L. Schiermiester 2014. Commercially Available DNA Tests for the Genetic Improvement of Beef Cattle, Revision. NebGuide G1856 (Minor Revision).
13. **Spangler, M.L.** 2015. Value of collecting phenotypes. eBEEF.org
14. **Spangler, M.L.** 2015. Initial Genome-Wide Association Study of Feed Intake Related Traits in Beef Cattle. eBEEF.org
15. **Spangler, M.L.** 2015. EPD basics and definitions. eBEEF.org
16. Weaber, R.L., and **M.L. Spangler**. 2015. How DNA testing will affect the accuracy of EPD information. eBEEF.org
17. **Spangler, M.L.** 2016. Economically relevant traits. eBEEF.org
18. **Spangler, M.L**. 2018. Recent changes to National Cattle Evaluation. eBEEF.org
19. **Spangler, M**.L. 2019. Bias. Beef Improvement Federation Guidelines wiki.
20. **Spangler, M. L.**. 2021.Expected progeny differences. National Beef Cattle Evaluation Consortium Sire Selection Manual (3rd edition).
21. **Spangler, M. L.**. 2021. Interpretation and use of expected progeny differences. National Beef Cattle Evaluation Consortium Sire Selection Manual (3rd edition).
22. Enns, R.M., and **Spangler, M. L.**. 2021.Tools for economic improvement beyond EPD. National Beef Cattle Evaluation Consortium Sire Selection Manual (3rd edition).
23. **Spangler, M. L.**. 2021.Decision support systems. National Beef Cattle Evaluation Consortium Sire Selection Manual (3rd edition).

Research Accomplishments:

Graduate Student Advising
Graduate Committees (Current): MS=0; Ph.D.=4 (1 in Statistics,1 at Kansas State)
Graduate Committees (Completed): M.S. =9 (2 in Statistics); Ph.D. =13 (2 in Brazil, 1 in VBMS)
Graduate Student Advisor (Current): M.S.=0;PhD=2
Graduate Student Advisor (Completed): M.S.=9; M.A.S.=1; Ph.D.=3
Undergraduate Honors Thesis Advisor (Completed)=1
Visiting Scholars: Current = 0; Completed=3
Postdoctoral Students: Current=1; Completed = 5
External examiner: PhD=3 (Canada, Australia, Ireland)

Honors and Awards of Graduate Students and Postdocs Under My Direction
Walton-Berry Award, American Simmental Association, 2022.
UNL Postdoc Travel Award, 2022.
UNL Postdoc Slam research presentation competition winner, 2021
Othmer Fellowship, UNL Department of Animal Science, 2021.
CAB Colvin Graduate Scholarship (2020)
Pork Checkoff Student Travel Award for the National Swine Improvement Federation meetings (2019)

Widaman Distinguished Graduate Fellowship Award, UNL Institute of Agriculture and Natural Resources, 2019.
BIF Roy Wallace Scholarship, 2018, 2020
BIF Shark Tank finalist, 2024 (1)
Larrick/Whitmore Travel Scholarship, UNL, 2012 (1), 2014 (2), 2016 (1), 2018 (1), 2022 (3)
UNL Graduate College Travel Grant, 2016.
Frank Baker Memorial Essay Contest, Beef Improvement Federation, 2012, 2016 (2), 2020, 2024
Shear Miles Fellowship, UNL Institute of Agriculture and Natural Resources, 2012.
Gamma Sigma Delta, inducted for membership, 2012 (1), 2016 (1), 2017 (1), 2020 (2), 2022(2), 2024(1).
BIF Reg. Scholarship, 2013 (2), 2024 (1)
American Association of Animal Science Annual Meeting Presidents Pick Abstract, 2013, 2020.

Referred Journals (since last promotion: 42; career total: 71)
In the following list of publications a '*' indicates that the publication was a collaboration with a current or former undergraduate, graduate, post-doctoral student, or visiting scientist.

1. Sapp, R. L., **M. L. Spangler**, R. Rekaya, and J. K. Bertrand. 2005. A simulation study for analysis of uncertain binary responses: Application to first insemination success in beef cattle. Genet. Sel. Evol. 37:615-634.
2. **Spangler, M. L.**, R. L. Sapp, R. Rekaya, and J. K. Bertrand. 2006. Success at first insemination in Australian Angus cattle: Analysis of uncertain binary responses. J. Anim. Sci. 84:20-24.
3. **Spangler, M. L.,** J. K. Bertrand, and R. Rekaya. 2007. Combining molecular test information and correlated phenotypic records for breeding value estimation. J. Anim. Sci. 85:641-649.
4. **Spangler, M. L.,** R. L. Sapp, M. D. MacNeil, J. K. Bertrand, and R. Rekaya. 2008. Different methods of selecting animals for genotyping to maximize the amount of genetic information known in the population. J. Anim. Sci. 86:2471-2479.
5. **Spangler, M. L.,** K. R. Robbins, M. D. MacNeil, J. K. Bertrand, and R. Rekaya. 2009. Ant colony optimization as an alternative method for genotype sampling. Anim. Genetics 40: 308-314.
6. Kachman, S.D., **M. L. Spangler**, G. L. Bennett, K. J. Hanford, L. A. Kuehn, W. M. Snelling, R. M. Thallman, M. Saatchi, and D. J. Garrick, R.D. Schnabel, J.F. Taylor, and E. J. Pollak. 2013. Comparison of molecular breeding values based on within- and across-breed training in beef cattle. Genetics Sel. Evol. 45:30.
7. Tart, J.K., R.K. Johnson, J.W. Bundy, N.N. Ferdinand, J.R. Wood, A.M. McKnite, P.S. Miller, M.F.R. Rothschild, **M.L. Spangler**, D.J. Garrick, S.D. Kachman, and D.C. Ciobanu. 2013. Genome-wide prediction of age at puberty and reproductive longevity in sows. Anim. Genetics 44: 387-397.
8. Howard*, J.T, S. D. Kachman, M.K. Nielsen, T. L. Mader, and **M. L. Spangler**. 2013. The effect of Myostatin genotype on body temperature during extreme temperature events. J. Anim. Sci. 91: 3051-3058.
9. Howard*, J.T., S. D. Kachman, W.M. Snelling, E.J Pollak, D. C. Ciobanu, L. A. Kuehn, and **M. L. Spangler**. 2014. Beef cattle body temperature during climatic stress: A genome wide association study. International J. Biometeorology 58:1665:1672.

10. Alhberg*, C.M., L. N. Schiermiester*, J. T. Howard*, C. Calkins, and **M.L. Spangler**. 2014. Genome wide association study of cholesterol and poly- and mono-unsaturated fatty acids, protein, and mineral content of beef from crossbred cattle. Meat Sci. 98: 804-814.
11. Mahdi Saatchi, Jonathan E Beever, Jared E. Decker, Dan B. Faulkner, Harvey C Freetly, Stephanie L Hansen, Helen Yampara-Iquise, Kristen A Johnson, Stephen D Kachman, Monty S Kerley, JaeWoo Kim, Daniel D Loy, Elisa Marques, Holly L Neibergs, E John Pollak, Robert D Schnabel, Christopher M Seabury, Daniel W Shike, Warren M Snelling, **Matthew L Spangler**, Robert L Weaber, Dorian J Garrick and Jeremy F Taylor. 2014. QTL, candidate genes, metabolic and signaling pathways associated with growth, metabolic mid-test weight, feed intake and feed efficiency in beef cattle. BMC Genomics 15:1004.
12. Chandrasekhar Natarajan, Federico G. Hoffmann, Hayley C. Lanier, Zachary A. Cheviron, **Matthew L. Spangler**, Roy E. Weber, Angela Fago, and Jay F. Storz . 2015. Intraspecific Polymorphism, Interspecific Divergence, and the Origins of Function-Altering Mutations in Deer Mouse Hemoglobin. Mol. Bio. Evol. 32: 978-997.
13. Schiermiester*, L.N., R.M. Thallman, L.A. Kuehn, S.D. Kachman, and **M.L. Spangler**. 2015. Estimation of breed-specific heterosis effects for birth, weaning and yearling weight in cattle. J. Anim. Sci. 93: 46-52. (One of the top 10 cited articles in JAS in 2015).
14. Lucot, K.L., **M.L. Spangler**, M.D. Trenhaile, S.D. Kachman, and D.C. Ciobanu. 2015. Evaluation of reduced subsets of Single Nucleotide Polymorphisms for the prediction of age at puberty and reproductive longevity in sows. Anim. Genetics 46:403-409.
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41. Ghebrewold, R.A., and **M. L. Spangler**. 2016. A genome-wide association study for changes in dry matter intake due to temperature variation in an admixed beef cattle population. J. Anim. Sci. 94: Suppl. 2.
42. Schweer, K.R., S.D. Kachman, L.A Kuehn, and **M.L. Spangler**. 2016. Comparison of SNP and haplotype models for genome-wide association studies for feed efficiency traits in crossbred beef cattle. Proceedings of the International Society of Animal Genetics, Salt Lake City, UT.
43. He, Jun, Xiao-Lin Wu, Stewart Bauck, Jiaqi Xu, Jungjae Lee, Gota Morota, Stephen Kachman, and **Matthew Spangler**. 2016. Comparing two strategies for selecting low density SNPs for imputation-mediated, multiple-trait genomic prediction in a U.S. Holstein population. Proceedings of the International Society of Animal Genetics, Salt Lake City, UT.
44. Ciobanu, D.C., S. D. Kachman, S. Olson, **M. L. Spangler**, M. Trenhaile, Jean-Jack Riethoven, C. A. Lents, J. Thorson, R. Massey, and T. J. Safranski. 2016. Translational Genomics for Improving Sow Reproductive Longevity. J. Anim. Sci. 94: Suppl. 2.
45. Taylor, Jeremy F., Jonathan E Beever, Jared E Decker, Harvey C. Freetly, Dorian J. Garrick, Stephanie L Hansen, Kristen A Johnson, Monty S. Kerley, Daniel D. Loy, Holly L. Neibergs, Mahdi Saatchi, Robert D Schnabel, Christopher M. Seabury, Daniel W. Shike, **Matthew L. Spangler** and Robert L. Weaber. 2017. The Genetic Improvement of Feed Efficiency in Beef Cattle. J. Anim. Sci. 95: Suppl. 2.
46. Wijesena, H.R., Clay A. Lents, Melanie D. Trenhaile-Grannemann, Jean-Jack Riethoven, Brittney N. Keel, Jennifer F. Thorson, Phillip S. Miller, Rodger K. Johnson, **Matthew L. Spangler,** Stephen D. Kachman, Daniel C. Ciobanu. 2017. The role of age at puberty and energy restriction in sow development and reproductive longevity: a genomic perspective. J. Anim. Sci. 95: Suppl. 2.
47. Ciobanu, D.C., H.R. Wijesena, C.A. Lents, M.D. Trenhaile-Grannemann, J.J. Riethoven, J.F. Thorson, B.N. Keel, P.S. Miller, **M.L. Spangler**, S.D. Kachman. 2017. Integration of genomic resources to uncover pleiotropic regions associated with age at puberty and

reproductive longevity in sows. Plant and Animal Genome Conference XXIV Conference, San Diego, CA.

48. Speidel, S.E., B. A. Buckley, R. J. Boldt, R. M. Enns, X. Zeng, J. Lee, **M. L. Spangler**, and M. G. Thomas. 2017. Genome-wide association study for stayability in Red Angus Cattle. J. Anim. Sci. 95: Suppl. 4.
49. Buckley, B.A., S.E. Speidel, R. J. Boldt, R. M. Enns, X. Zeng, **M. L. Spangler**, J. Lee, and M. G. Thomas. 2017. Genome-wide association study of heifer pregnancy in Red Angus Cattle. J. Anim. Sci. 95: Suppl. 4.
50. Snelling, W.M., S.D. Kachman, G.L. Bennett, **M.L. Spangler**, L.A. Kuehn, and R.M. Thallman. 2017. Functional SNP associated with birth weight in independent populations identified with a permutation step added to GBLUP-GWAS. J. Anim. Sci. 95: Suppl. 4.
51. Yu, Haipeng, **Matthew L. Spangler**, Ronald M. Lewis, and Gota Morota. 2017. Genomic relatedness strengthens genetic connectedness across management units. J. Anim. Sci. 95: Suppl. 4.
52. Paz, H.A., K. E. Hales, J. E. Wells, L. A. Kuehn, H. C. Freetly, **M. L. Spangler**, S. C. Fernando. 2017. Identifying the influence of the rumen microbiome on the feed efficiency phenotype in beef cattle. J. Dairy Sci. 100: Suppl. 2.
53. Wijesena, H.R., C.A. Lents, B.N. Keel, J.-J. Riethoven, **M.L. Spangler**, S. D. Kachman and D.C Ciobanu. 2018. Integration of gene expression profiling of hypothalamic arcuate nucleus with genome-wide associations to discover functional variants associated with age at puberty in gilts. Plant and Animal Genome Conference XXV Conference, San Diego, CA.
54. **Spangler, M.L.** 2018. Harlan Ritchie Symposium: Current trends in beef cattle genetic evaluation (invited). J. Anim. Sci. 96: Suppl. 2.
55. Howard, J.T., T. A. Rathje, C. E. Bruns, D. F Wilson-Wells, S. D. Kachman, and **M. L. Spangler**. 2018. The impact of truncating data on the predictive ability of selection candidate EBV in swine using ssGBLUP. J. Anim. Sci. 96: Suppl. 2.
56. Yu, Haipeng, **Matthew L. Spangler**, Ronald M. Lewis, and Gota Morota. 2018. An Assessment of Genomic Relatedness across Management Units. J. Anim. Sci. 96: Suppl. 2.
57. **Spangler, M.L.** 2018. Genomic Selection: Historical perspective and development of methods in use today (invited). J. Anim. Sci. 96: Suppl 3.
58. Lewis, R.M., L.A. Kuehn, H. Yu, G. Morota, and **M.L. Spangler**. 2018. Genetic connectedness in the U.S. sheep industry. Proc. European Animal Agriculture Production Meeting.
59. **Spangler, M.L**. 2019. US National Beef Cattle Single Step Genomic Evaluations. Plant and Animal Genome Conference XXVI Conference, San Diego, CA.
60. Sollero, Bruna, Jeremy Howard, Vinicius Junqueira, Fernando Cardoso, and **Matthew Spangler.** The impact of reducing the frequency of animals genotyped at higher density on imputation and prediction accuracies using ssGBLUP. 2019. Plant and Animal Genome Conference XXVI Conference, San Diego, CA.
61. Baller, J.L., J. T. Howard, S. D. Kachman, and **M.L. Spangler**. 2019. A comparison of clustering methods for cross-validation of genomic predictors when training on phenotypes or deregressed Estimated Breeding Values. J. Anim. Sci. 97: Suppl.2.
62. See, Garrett M., Melanie D. Trenhaile-Grannemann, Daniel C. Ciobanu, **Matthew L. Spangler**, and Benny E. Mote. 2019. A genome-wide association study for gestation length in swine. J. Anim. Sci. 97: Suppl. 2.

63. Upperman, L.R., E. J. Pollak, and **M. L. Spangler**. 2019. The impact of putative causal variants and animal misidentification on genome-wide association studies for carcass traits in beef cattle. J. Anim. Sci. 97: Suppl. 2.

64. Salvian, Mayara, Gabriel Costa Monteiro Moreira, Mônica Corrêa Ledur, Luiz Lehmann Coutinho, Gerson Barreto Mourão, and **Matthew L. Spangler**. 2019. Re-ranking of estimated breeding values using different panel densities with ssGBLUP in broiler chickens. J. Anim. Sci. 97: Suppl. 2.

65. Plotzki Reis, Andrea, Fabyano Fonseca e Silva, Fernando Flores Cardoso, and **Matthew L. Spangler.** 2019. The impact of selective phenotyping and genotyping over generations in beef cattle. J. Anim. Sci. 97: Suppl. 2.

66. Abbas, Waseem, Jeremy T. Howard, Henry A. Paz, Kristin E. Hales, James E. Wells, Larry A. Kuehn, **Matthew L. Spangler**, Galen E. Erickson, Samodha C. Fernando. 2019. Host genetics help shape the rumen microbiome in beef cattle. J. Anim. Sci. 97: Suppl. 2.

67. Weaber, R.L., L. A. Kuehn, W. M. Snelling, R. M. Thallman, B. L. Golden and **M. L. Spangler**. Beef Cattle Genetic Technology Utilization - Survey of Stakeholders 2018. 2019. J. Anim. Sci. 97: Suppl. 3.

68. Wijesena, H.R., **M. L. Spangler**, S.D. Kachman, and D.C. Ciobanu.2020. Fine Mapping Genetic Variants Associated with Age at Puberty and Sow Fertility Using SowPro90 Genotyping Array. Plant and Animal Genome Conference XXVII Conference, San Diego, CA.

69. Baller, Johnna L., Stephen D. Kachman, Larry A. Kuehn, and **Matthew L. Spangler**. 2020. Using pooled data for single-step genomic prediction: Impact of within-pool variance and size. J. Anim. Sci. 98: Suppl. 4.

70. Upperman, Lindsay R., Larry A. Kuehn, and **Matthew L. Spangler**. 2020. Genetic parameter estimates for days on feed, age at slaughter, and carcass traits in a multibreed beef cattle population. J. Anim. Sci. 98: Suppl. 4.

71. See, Garrett M., Benny E. Mote, and **Matthew L. Spangler**. 2020. Impact of inclusion rates of crossbred phenotypes and genotypes in nucleus selection programs. J. Anim. Sci. 98: Suppl. 4.

72. Ribeiro, Andre, Bruce L. Golden, and **Matthew L. Spangler**. 2020. President Oral Presentation Pick: Using Deep Neural Networks to determine birth weight data quality for genetic evaluations in beef cattle. J. Anim. Sci. 98: Suppl. 4.

73. Bullock, K.D., K. R. VanValin, J. W. Lehmkuhler, L. H. Anderson, B. R. Crites, K. M. Laurent, **M. L. Spangler**, and R. L. Weaber. 2020. Effectiveness of an Educational Program on Beef Bull Selection that Incorporates Classroom Instruction and a Mock Auction. J. Anim. Sci. 98: Suppl. 4.

74. Bartenslager, A., N. Aluthge, J. Loy, **M. Spangler**, and S. Fernando. 2020. Resilience of the ocular microbiome in beef calves. J. Anim. Sci. 98: Suppl. 3

75. Russell, C., E.J. Pollak, and **M.L. Spangler**. 2021. Genetic Parameter Estimates for Bull Prolificacy and its Relationship with Scrotal Circumference in a Commercial Beef Cattle Population. J. Anim. Sci. 99: Suppl. 1.

76. Ribeiro, Andre, Hiruni Wijesena, Daniel C. Ciobanu, Steve Horvath, and **Matthew L. Spangler**. 2021. Relationship of age and genetics with the methylation profile of beef cattle. J. Anim. Sci. 99: Suppl. 1.

77. Petrini,Juliana, Bruno Gabriel Nascimento Andrade, Tainã Figueiredo Cardoso, Aline Silva Mello Cesar, Bárbara Silva-Vignato, Gota Morota, **Matthew Lee Spangler**, Luciana Correia de Almeida Regitano, Luiz Lehmann Coutinho, Gerson Barreto Mourão.

2021. Imputation to whole-genome sequence by using a small reference population. 38th International Society for Animal Genetics Conference.

78. **Spangler, M.L**. 2021. On the future of 'economically relevant' traits in livestock. Proc. Visions Conference, Ames, IA.
79. Carroll, A.L**., M. L. Spangler**, D.L. Morris, P. J. Kononoff. 2022. Estimating between-animal variance of energy utilization in lactating Jersey cows **.** J. Dairy Sci. 105: Suppl. 1
80. Sanglard*, Leticia P., Larry A. Kuehn, Warren M. Snelling, and **Matthew L. Spangler.** 2022. Genotype concordance between SNP chip and imputed low-pass whole-genome sequence in beef cattle. J. Anim. Sci.100: Suppl. 3.
81. Sanglard*, Leticia P., Garrett M. See, and **Matthew L. Spangler**. 2022. Including gene-edited individuals in genetic evaluations can bias the estimated breeding values of their progeny. J. Anim. Sci.100: Suppl. 3
82. Hess, M. G. Erickson, and **M. Spangler**. 2023. Genomic analysis of liver abscesses in feedlot beef cattle. AGBT-Ag Conference
83. Adams, Seidu, Nirosh Aluthge, Waseem Abbas, **Matthew L. Spangler**, James Wells, Kristin Hales, Larry Kuehn, Thomas Burkey, Phillip Miller, and Samodha C. Fernando. 2023. Microbiomes from the theory to application. J. Anim. Sci. 101: Suppl. 2.
84. Lakamp*, A.D., A.C. Neujahr, M.M. Hille, J.D. Loy, S.C. Fernando, and **M.L. Spangler.** 2023. Longitudinal Heritability of Ocular Microbiota in Preweaned Beef Cattle. J. Anim Sci. 101: Suppl. 3.
85. **Spangler, M.L.**, B.L. Golden, and S. Newman. 2023. Genetic selection for improved profit conditioned on enterprise-specific circumstances. J. Anim. Sci. 101: Suppl. 3
86. Mackenzie Stohlmann, Melanie K Hess, Sadie Ference, Sarah R Nafziger, Jessica A Keane, Anna Fuller, Scott G Kurz, **Matthew L Spangler**, Jessica L Petersen, Andrea S Cupp. 2023. Puberty classifications in beef heifers are moderate to highly heritable with nucleotide polymorphisms (SNPs) from candidate genes highly associated to their cyclicity and timing of puberty. Gil Greenwald Reproductive Symposia.
87. Adams, S., **M. Spangler**, and S. Fernando. 2024. Oral and Rumen Microbiome Characterization to Predict Host Phenotypes**.** Submitted to Midwest ASAS.
88. **Spangler, M.L.** 2024. Machine learning and AI to improve genetic prediction in beef cattle: Potential uses and misuses**.** Submitted to ASAS (invited)
89. Stohlmann, Mackenzie D.; Melanie K. Hess; Sadie S. Ference; Sarah R. Nafziger; Jessica A. Keane; Anna M. Fuller; Scott G. Kurz; **Matthew L. Spangler**; Jessica L. Petersen; Andrea S. Cupp. 2024. Puberty classifications in beef heifers are moderate to highly heritable and associated with single nucleotide polymorphisms from candidate genes related to cyclicity and timing of puberty**.** Submitted to SSR.
90. Batt, Mackenzie C, Leila G Venzor, Keri Gardner, Rachel R Reith, Kelsey A Roberts, Nicolas J Herrera, Anna M Fuller, Gary A Sullivan, J Travis Mulliniks, **Matthew L Spangler**, Stephanie J Valberg, David J Steffen, Jessica L Petersen. An autosomal recessive mutation in *PYGM* causes myophosphorylase deficiency in composite cattle. Submitted to ASAS.

Technical Publications (Beef Research Reports) (since last promotion:5;career total:18)

1. Dib, M. G., L. D. Van Vleck, and **M. L. Spangler**. 2010. Genetic Analysis of Mature Size in American Angus Cattle.

2. **Spangler, Matthew L**., Stephen Kachman, Kathryn Hanford, Mark Thallman, Gary Bennett, Warren Snelling, Larry Kuehn, and John Pollak. 2011. Integration of DNA marker information into breeding value predictions.
3. Whitacre, L.K. and **M.L. Spangler**. 2012. The Simmental breed: Population structure and generation interval trends.
4. Pruitt, S.K., K.M. Rolfe, B. Nuttelman, W.A. Griffin, J.R. Benton, G.E. Erickson, and **M.L. Spangler**. 2012. Association of Mysostatin on performance and carcass characteristics in crossbred cattle.
5. Summers, A.F., R.A. Cushman, S.P. Weber, K.V. Moline, J.W. Bergman, **M.L. Spangler**, and A.S. Cupp. 2012. Nutritional regime and antral follicle count impact reproductive characteristics in heifers.
6. Howard, J., L. Whitacre, M. **Spangler.** 2013. Efficacy of newborn bovine DNA samples taken via different mediums in assigning paternity.
7. Moore, S.K., C.J. Schneider, K.M. Rolfe, B. Nuttelman, D.B. Burken, W.A. Griffin, J.R. Benton, G.E. Erickson, and **M.L. Spangler**. 2013. Association of inactive Mysostatin in Piedmontese-influenced steers and heifers on performance and carcass characteristics at different endpoints.
8. Kachman, S.D., and **M.L. Spangler**. 2014. Evaluation of Red Angus genomic predictors.
9. Schiermiester, L.N., R.M. Thallman, L.A. Kuehn, and **M.L. Spangler**. 2015. Estimation of breed-specific heterosis effects for birth, weaning and yearling weight in cattle.
10. Ahlberg, C.M., L.A. Kuehn, R.M. Thallman, S.D. Kachman, and **M.L. Spangler**. 2015. Genetic parameter estimates for calving difficulty and birth weight and in a multi-breed population.
11. Boyd, B.M., S.D. Shackelford, K.E. Hales, T.M. Brown-Brandl, M.L. Bremer, **M.L. Spangler**, and G.E. Erickson. 2016.Effects of shade and feeding zilpaterol hydrochloride to finishing steers on performance, carcass quality, heat stress, and mobility, and body temperature.
12. Ochsner, K.P., M.D. MacNeil, R.M. Lewis, and **M.L. Spangler**. 2017. Development of Terminal and Maternal Economic Selection Indices in Beefmaster Cattle.
13. Saatchi, M., R. L. Fernando, L. Hyde, S. McGuire, W. Shafer, **M. L. Spangler**, and B. Golden. 2018. Empirical progeny equivalent of genotyped animals in a multi-breed beef cattle genetic evaluation using a single-step Bayesian regression model. Iowa State Beef Cattle Report.
14. Baller, Johnna L., Stephen D. Kachman, Larry A. Kuehn, and **Matthew L. Spangler**. 2021. Using pooling to capture commercial data for inclusion in genetic evaluations.
15. Upperman, Lindsay R., Larry A. Kuehn, and **Matthew L. Spangler**. 2021. Genetic parameter estimates for age at slaughter and days to finish in a multibreed beef cattle population.
16. Ribeiro, Andre, Bruce L. Golden, and **Matthew L. Spangler**. 2021. Categorization of birth weight phenotypes for inclusion in genetic evaluations using a Deep Neural Network.
17. Sanglard, Leticia P., Garret M. See, and **Matthew L. Spangler.** Including Gene Edited Sires in Genetic Evaluation**.** 2023.
18. Valasek, H.F., B.L. Golden, and **M.L. Spangler**. 2023. Impact of Planning Horizon Length on Breeding Objectives and Resulting Selection Decisions.

Proceedings (Peer reviewed) (since last promotion: 7; career total:20)

1. Martinez-Avila, J.C., **M. Spangler**, and R. Rekaya. 2006. Hierarchical model for zero-inflated count data: A simulation study. Proc. 8th World Congress on Genetics Applied to Livestock Production.
2. Dib, M. G., L. D. Van Vleck, and **M. L. Spangler**. 2009. Estimates of Genetic Parameters for Weight and Height of Angus Cows using a Repeatability Model. Proc. Western Section Animal Science Meetings, Vol. 60 pp 40-41.
3. Soga, N., **M. L. Spangler**, C. R. Schwab, P. J. Berger, and T. J. Baas. 2010. Comparison of Connectedness Measures and Changes in Connectedness of the U.S. Duroc Population. In Proc. 9th World Congress on Genetics Applied to Livestock Production.
4. Schiermiester, L.N., R.M. Thallman, L.A. Kuehn, and **M.L. Spangler**. 2014. Estimation of breed-specific heterosis effects for birth, weaning and yearling weight in cattle. In Proc. 10th World Congress on Genetics Applied to Livestock Production.
5. Ahlberg, C.M., L.A. Kuehn, R.M. Thallman, S.D. Kachman, and **M.L. Spangler**. 2014. Genetic parameter estimates for calving difficulty and birth weight in a multi-breed population. In Proc. 10th World Congress on Genetics Applied to Livestock Production.
6. Weaber, R.L., J.E. Beever, H.C. Freetly, D.J. Garrick, S.L. Hansen, K.A. Johnson, M.S. Kerley, D.D. Loy, E. Marques, H.L. Neibergs, E.J. Pollak, R.D. Schnabel, C.M. Seabury, D.W. Shike, **M.L. Spangler,** and J.F. Taylor. 2014. Analysis of US Cow-Calf Producer Survey Data to Assess Knowledge, Awareness and Attitudes Related to Genetic Improvement of Feed Efficiency. In Proc. 10th World Congress on Genetics Applied to Livestock Production.
7. Lewis, R.M., **M. L. Spangler**, B. B. Lockee, R. M. Enns, K. J. Enns, J. C. Dekkers, C. Maltecca, J. P. Cassady, M. MacNeil, C. A. Gould, D. L. Boggs, I. Misztal and E. J. Pollak. 2014. Filling the Knowledge Gap: Integrating Quantitative Genetics and Genomics in Graduate Education and Outreach. In Proc. 10th World Congress on Genetics Applied to Livestock Production.
8. Howard, J.T., S. D. Kachman, and **M. L. Spangler**. 2018. The impact of utilizing previous generations of genotyped animals in genomic selection. Proc. 11th World Congress on Genetics Applied to Livestock Production.
9. Baller, J.L., S. D. Kachman, and **M.L. Spangler**. 2018. The impact of different clustering methods on the estimated accuracy of genomic predictors. Proc. 11th World Congress on Genetics Applied to Livestock Production.
10. Pariacote, F.A., E.J. Pollak, and **M. L. Spangler**. 2018. Genetic Parameter Estimates between Maternal and Terminal Traits in Composite Beef Cattle Population. Proc. 11th World Congress on Genetics Applied to Livestock Production.
11. Gruhot, T.R., L.A. Rempel, **M. L. Spangler**, and B. E. Mote. 2018. The heritability of vessel size of the pampiniform plexus as a means to assess the genetic component of varicocele. Proc. 11th World Congress on Genetics Applied to Livestock Production.
12. Yu, Haipeng, **Matthew L. Spangler**, Ronald M. Lewis, and Gota Morota. 2018. Stronger measures of genomic connectedness enhance prediction accuracies across management units. Proc. 11th World Congress on Genetics Applied to Livestock Production.
13. Zimmermann, M.J., L. A. Kuehn, **M. L. Spangler**, R. M. Thallman, W. M. Snelling, and R. M. Lewis. 2018. Modelling Growth from Weaning to Maturity in Beef Cattle Breeds. Proc. 11th World Congress on Genetics Applied to Livestock Production.
14. Russell, C.A., L.A. Kuehn, W.M. Snelling, and **M.L. Spangler**. 2022. Genetic prediction for growth traits in beef cattle using selected variants from imputed low-pass sequence data. Proc. 12th World Congress on Genetics Applied to Livestock Production.

15. Bullock, K.D., **M.L. Spangler,** R.L. Weaber, T.N. Rowan, M.M. Rolf, J.E. Decker, D.D. Loy, B.L. Golden, J.J. White and A.L. Van Eenennaam. 2022. Conducting a National Beef Cattle Genetics Outreach Program in the USA**.** Proc. 12th World Congress on Genetics Applied to Livestock Production.
16. Lakamp, A.D., A.C. Neujahr, M.M. Hille, J.D. Loy, S.C. Fernando, **M.L. Spangler.** 2022. Variance component estimation of longitudinal alpha diversity metrics of the ocular microbiome in preweaned beef cattle. Proc. 12th World Congress on Genetics Applied to Livestock Production.
17. See, G.M., J.S. Fix, C.R. Schwab and **M.L. Spangler.** 2022. Filling information gaps in swine crossbreeding schemes by imputing non-genotyped F_1 animals to improve genetic gain. Proc. 12th World Congress on Genetics Applied to Livestock Production.
18. Valasek, H.F., B.L. Golden, and **M.L. Spangler.** 2022. Impact of planning horizon length on the relative emphasis of traits in economic breeding goals. Proc. 12th World Congress on Genetics Applied to Livestock Production.
19. Sanglard, L.P., L.A. Kuehn, W.M. Snelling, and **M.L. Spangler.** 2022. Mitochondrial DNA copy number as a potential genetic indicator of growth and carcass traits in beef cattle. Proc. 12th World Congress on Genetics Applied to Livestock Production.
20. **Spangler, M.L.,** B.L. Golden, S. Newman, L.A. Kuehn, W.M. Snelling, R.M. Thallman, and R.L. Weaber. 2022. iGENDEC: A web-based decision support tool for economic index construction. Proc. 12th World Congress on Genetics Applied to Livestock Production.

Book Chapters (since last promotion: 2; career total:5)

1. **Spangler, M.L.,** 2024. Genetics and cattle breeding. In: Dikeman, M. (Ed.), Encyclopedia of Meat Sciences III, vol. 1. Elsevier, pp. 640–647. https://dx.doi.org/10.1016/B978-0-323-85125-1.00064-8.
2. **Spangler, M.L.** 2022. Introduction. Animal Breeding and Genetics as part of the Encyclopedia of Sustainability Science and Technology Series, SpringerNature (M.L. Spangler as editor)
3. **Spangler, M.L.** 2016. Traditional animal breeding of cattle to improve carcass composition and meat quality, with emphasis on marbling and tenderness. M. Dikeman (ed.), *Ensuring safety and the quality in the production of beef Volume 2: Quality*, Burleigh Dodds Science Publishing, Cambridge, United Kingdom (ISBN: 978 1 78676 060 9; **www.bdspublishing.com)**
4. **Spangler, M.L**. 2013. Breeding in beef cattle. In Encyclopedia of Sustainability and Technology, Springer ().
5. Rekaya, R., K. Robbins, **M. Spangler**, S. Smith, E. H. Hay and K. Bertrand. (2013). Ant Colony Algorithm with Applications in the Field of Genomics. Ant Colony Optimization - Techniques and Applications. Book edited by Helio J.C. Barbosa, ISBN 978-953-51-1001-9, Published: February 20, 2013.

Grants and External Funding (PI: $3,304,578; CoPI:$14,905,258**)**

Extension Funding

Title of Grant	Agency Submitted To	Dollar Amount	Date Submitted	Dates of Support	Co-PI	Funded

1) Sire Selection and Cow herd Management Clinics	Action Team, UNL	$7,500	2008	2008-2009	Rasby, Bauer, Berger, Niemeyer	Yes
2) Nebraska Youth Beef Leadership Symposium	NE Beef Council	$2,500	2009	2008-2009	No	Yes
3) Genotype by Environment Interactions in Beef Cattle	Seed Grant, UNL	$60,000 ($40,000 Research $20,000 Extension)	2010	2010-2012	Kachman, Hanford	Yes
4) Nebraska Youth Beef Leadership Symposium	NE Beef Council	$2,500	2010	2009-2010	S. Ellicott	Yes
5) National Beef Cattle Evaluation Consortium	Cornell University	$30,000	2009	2009-2010	Hanford	Yes
6) Beef Cattle Genotyping Projects	Cornell University	$44,356	2010	2010-2011	No	Yes
7) Nutrient Utilization in Beef Cattle	USDA-NIFA AFRI North Carolina State Subcontract	$160,741	2010	----------	No	No
8) National Program for the Genetic Evaluation of Feed Efficiency in Beef Cattle	USDA-NIFA AFRI Missouri Subcontract	$426,717 ($5,000,000 total award)	2010	2011-2015	No	Yes
9) Genetic Improvement of Fertility in Beef Cattle	USDA-NIFA AFRI Iowa State Subcontract	$451,675	2012		Kachman	No
10) Translational Genomics for Improved Beef Cattle Fertility	USDA-NIFA AFRI Colorado State Subcontract	$924,114	2012		Kachman Hanford	No
11) Beef Improvement	USDA-NIFA-AFRI	$15,250	2013		Pollak	No

Federation Meeting	Conference grants					
12) Beef Improvement Federation Meeting	ARS	$15,000	2014	2014	No	Yes
13) Beef Cattle Decision Support	USDA-NIFA-AFRI	$3,050,744	2015		Weaber, Golden, Kuehn, Thallman, Snelling, Enns, Thomas, Speidel	No
14) Beef Cattle Decision Support	USDA-NIFA-AFRI	$299,312	2017	2018-2021	Weaber, Golden, Kuehn, Thallman, Snelling	Yes

Teaching Funding

Title of Grant	**Agency Submitted To**	**Dollar Amount**	**Date Submitted**	**Dates of Support**	**Co-PI**	**Funded**
1) Nebraska Beef Industry Scholars	Layman, UNL	$10,000	2008	----------	No	No
2) Nebraska Beef Industry Scholars	NE Dept. of Ag.	$5,000	2008	----------	No	No
3) Nebraska Beef Industry Scholars	NU Foundation, Private Donations	$148,778	2008-2013	2008 Forward	No	Yes
4) Bioinformatics	Life Sciences, UNL	$7,200	2009	2009-2010	Hanford	Yes
5) Teaching Herd Product Donation	Bahlen Mfg.	$30,000	2009	2009-Forward	No	Yes
6) Teaching Herd Product Donation	Intervet	$1,000	2011	2011	No	Yes
7) Teaching Herd Product Donation	Pfizer	$2,000	2008	2010	No	Yes
8) Animal Breeding and Genetics online Courses	USDA HEC North Carolina State Subcontract	$25,900	2010	2010-2011	No	Yes

9) Comprehensive Beef Education	USDA HEC	$500,000	2010	----------	Brink, Reiling, Rasby, Burson	No
10) Comprehensive Beef Education Planning Grant	USDA HEC	$28,033 5% Credit to Candidate	2011	2011-2012	Brink, Reiling, Rasby, Burson, Husmann,Schatt	Yes
11) Engaging the New Biology	USDA HEC Virginia Tech Subcontract	$69,749	2011	2011-2014	No	Yes
12) Nebraska Beef Industry Scholars	Nebraska Dept. of Agriculture	$2,500	2011	2011-2012	No	Yes
13) Nebraska Beef Industry Scholars	Nebraska Dept. of Agriculture	$2,500	2012	2012-2013	No	Yes
14) Beef Production Case Studies	USDA-HEC	$149,914	2013		Brink Field Reiling Burson Husmann Schacht	No
15) Nebraska Beef Industry Scholars	Nebraska Dept. Of Agriculture	$2,500	2013	2013-2014	No	Yes
15) Nebraska Beef Industry Scholars	Nebraska Dept. Of Agriculture	$2,500	2014	2014-2015	No	Yes
16) Beef production case studies: Integrating food safety, genomics, ecosystems health and animal welfare	USDA HEC	$149,855	2014	--------	Brink, Bruns, Burson, Conley, Field, Rasby	No
17) Nebraska Beef Industry Scholars	NE Dept. of Ag.	$2,750	2014	2015	No	Yes
18) Nebraska Beef Industry Scholars	NE Dept. of Ag.	$2,750	2015	2015-2016	No	Yes
19) Nebraska Beef Industry Scholars	NE Dept. of Ag.	$2,750	2016	2016-2017	No	Yes

20)Genetic and Genomic Short course in Brazil	UNL Global Engagement	$6,000 (50% to candidate)	2016	2016	Morota	Yes
21) Nebraska Beef Industry Scholars	NE Dept. of Ag.	$2,750	2017	2017-2018	No	Yes
22)Beef Genomics	FAPESP/UNL	37,800 (50% to candidate)	2017	2017-2019	Morota	Yes
23) Nebraska Beef Industry Scholars	NE Dept. of Ag.	$2,750	2018	2018-2019	No	Yes
24) Nebraska Beef Industry Scholars	NE Dept. of Ag.	$2,000	2019	2019-2020	No	Yes

Research Funding

Title of Grant	**Agency Submitted To**	**Dollar Amount**	**Date Submitted**	**Dates of Support**	**Co-PI**	**Funded**
1) Genetic Evaluation of Mature Weight	American Angus Association	$4,000	2008	2008-2009	No	Yes
2) Implementation of Genomic Selection	Layman's Award UNL	$10,000	2009	---------	No	No
3) Genotype by Environment Interactions in Beef Cattle	Seed Grant, UNL	$60,000 $40,000 Research $20,000 Extension	2010	2010-2012	Kachman, Hanford	Yes
4) Genomics of Temperature Variation in Beef Cattle	Layman's Award, UNL	$9,960	2010	2011-2012	No	Yes
5) Genetic Susceptibility to PRSS in Swine	National Pork Board	$102,720	2009	----------	Ciobanu, Johnson	No
6) Genetic and Phenotypic Fertility Markers in Beef Cattle	USDA Foundational Program	$500,000	2010	----------	Cupp, Wood, Miles, Cushman	No
7) Incorporation of Genomic Information in Multi-breed and Crossbred Populations	USDA Foundational Program	$750,000	2010	----------	Kachman, Templeman	No

8) Phenotypic and Genotypic Effects of Myostatin in Beef Populations	Lone Creek Cattle Company	$53,880	2010	2010-2012	Ciobanu	Yes
9) Genetic Variants Impacting Meat Quality Traits in Beef Cattle	NE Beef Council	$30,000	2010	----------	Ciobanu	No
10) Mechanisms of Fertility in High and Low Antral Follicle Count Cattle	IANR Strategic Investments, UNL	$350,000	2010	---------	Cupp, Wood, Ciobanu, Pannier, Miles, Cushman	No
11) Incorporation of Genomic Information in Multi-breed and Crossbred Populations	USDA Foundational Program	$500,000	2011	----------	Kachman, Hanford	No
12) Economic Optimization of Selection Using Phenotypic and Genomic Information in Beef Cattle	USDA Foundational Program	$500,000	2011	----------	Nielsen, Kachman	No
13) Colonization of Poultry by Salmonella is a Complex Trait Influenced by Host Genotype, Gut Microbiota, and Diet.	USDA-NIFA-AFRI	$2,404,295	2011	----------	Fernando, Purdum, Hanford, Albrecht, Benson, Walter	No
14) Development of Genomic Predictions for Beef Cattle Fertility Traits	Nebraska Research Initiative	$99,875	2011	----------	Kachman Hanford	No
15) Evaluation of the proportion of phenotypic variation in carcass marbling, quality grade,	Nebraska Beef Council	$39,627	2012		No	No

and feedlot gain explained by GeneMax						
16) Request for an Ion Torrent Personal Genome Machine	UNL Hatch Equipment Funds	$50,000	2012		Fernando et al.	No
17) Translational Genomics for Improved Sow Reproductive Longevity	USDA-AFRI	$1,166,650 6% credit to candidate	2012	2013-2015	Ciobanu Kachman Riethovan	Yes
18) Microbiome-host genotype interactions	USDA-AFRI-NIFA	$491,171 10% credit to candidate	2013		Fernando Erickson MacDonald	No
19) Understanding genotype-microbiome interactions towards identifying new genetic markers to increase feed efficiency	Multi-State Hatch-Enhance Funding	$197,000 10% credit to candidate	2013	2013-2018	Fernando Erickson MacDonald	Yes
20) epMotion Liquid Handler	UNL ARD Equip. Grant	$43,264 5% Credit to candidate	2013	2013	Fernando Erickson Ciobanu Wood Tait Su Zempleni	Yes
21) Impact of feeding Zilmax on heat stress and locomotion	NE Beef Council	$51,080 50% credit to candidate	2013	2013-2014	Erickson Hales Brown-Brandl	Yes
22) Beef growing and finishing equipment	UNL ARD Strategic Funding	$140,345 5% credit to candidate	2014	2014-2015	Erickson Fernando MacDonald Drewnoski	Yes
23) Evaluating interactions between host genotype and rumen microbiota towards	USDA NIFA	$499,859	2014		Fernando Erickson Lewis	No

identifying genetic markers and microbial species to improve feed efficiency						
Beef Cattle Genomics	UNL/USMARC	$80,000	2014	2014-2016	Kuehn	Yes
Selection for Heat Stress in Beef Cattle	USDA-NIFA-AFRI	$1,035,979 (UNL subcontract)	2015		Rolf, MacNeil, Brown-Brandle, Kachman, Lamberson	No
Engaging Scholars in Genomics	USDA-NIFA-AFRI	$2,994,930	2015		Lewis, Petersen,Morota	No
Feed Efficiency and Rumen Microbiota	USDA-NIFA-AFRI	$500,000	2015		Fernando	No
Selection for Heat Stress in Beef Cattle	USDA-NIFA-AFRI	$500,000	2016		Rolf, Kachman, Kuehn, Weaber	No
Haplotype Models in Genomic Selection	Multi-State Hatch	290,000 (50% to candidate)	2016	2016-2019	Kachman	Yes
Genetic/Genomic Selection	NU Foundation, Private Donations	196,500	2015-forward		Kachman	Yes
Feed Efficiency and Rumen Microbiota	USDA-NIFA-AFRI	$500,000	2016		Fernando	No
Feed Efficiency and Rumen Microbiota	USDA-NIFA-AFRI	$500,000	2017	2018-2021	Fernando	Yes
Low-pass sequence for genomic prediction	UNL/USMARC	$1,774,447	2019	2020-2024	Kuehn	Yes
National Ag Producer Data Cooperative: A Strategic Framework for Innovation	USDA-NIFA	$500,000	2021	2021-2023	Clarke, Lorang, Luck, Thompson, Franz, Herceg	Yes
Vertical transmission of the bovine	Multi-state HATCH	$200,000	2021	2021-2025	Fernando, Loy	Yes

microbiome from dams to calves: Towards improving feed utilization and animal health in beef production systems						
Genetic and dfm control of liver abscesses	FFAR	$124,516	2021		Erickson, MacDonald, Watson, Fernando	No
National Agricultural Producers Data Cooperative: Building a Strategic Framework for Increasing Production and Driving Innovation	USDA-NIFA	$960,000	2022	2022-2024	Clarke, Lorang, Luck, Thompson, Franz, Herceg	Yes
Development of selection tools for methane production, metabolic rate and efficiency in beef cattle using gas flux data	NIFA		2022		Rolfe et al.	No
Complement system regulation of extracellular histone toxicity in bovine respiratory disease	NIFA		2022		Gifford et al.	No
Advancing animal health through early detection of	UNL Grand Challenge	$149,998	2022		Xiong et al.	No

disease using phenotyping and precision monitoring technologies						
Development of selection tools for methane production, metabolic rate and efficiency in beef cattle using gas flux data	NIFA	$650,000	2023		Rolfe et al.	No
Evaluation of host-genetics role in viral disease using metagenomics and natural-infection models	UNL Animal Health	$125,000	2023	2023-2028	Ciobanu et al.	Yes
Explainable artificial intelligence modeling to decipher host-microbe interactions through large-scale genome-enabled microbiome analysis	NVIBE	$77,332	2023		Zhao et al.	No
Genomic and Colonization history-based microbiome establishment methods to improve animal efficiency and reduce methane emission in beef cattle	NIFA	$649,839	2023		Fernando et al.	No
Understanding Host, Microbial,	NIFA	$4,998,736	2023	2024-2028	Kononnoff et al.	Yes

Environmental, and Management Factors Towards Methane Mitigation in Ruminants						
Trusting Beef: Tools for Assessing Climate Smart Beef Systems to Influence Nebraskans for Generations about Robust Beef Production Ecosystems	UNL Grand Challenge	$5,000,000	2023		Erickson et al.	No
Improving Expected Progeny Difference Accuracy for Economically Relevant Traits Through DNA Pooling	American Simmental Association	$60,498	2023	2023-2025	Spangler et al.	Yes
Improving Expected Progeny Difference Accuracy for Economically Relevant Traits Through DNA Pooling	Red Angus Foundation	$60,498	2023	2023-2025	Spangler et al.	Yes
ODF: National Ag Producer Data Cooperative: Strategic Development	NIFA	$957,350	2023	2023-2025	Clarke et al.	Yes