

# Aeriel Belk

2563 Mimms Ln, Auburn AL, 36832

aeriel.belk@auburn.edu

(970) 232-5409

## Education

- Colorado State University** Aug 2021  
Doctor of Philosophy: Animal Science  
Certificate: Data Analysis  
Dissertation: The microbiome surrounding death and decay: microbial ecology of food processing, meat spoilage, and human decomposition environments
- Texas A&M University** May 2017  
Master of Science: Animal Science  
Certificates: Food Safety, Meat Science  
Thesis: Comparison of *Salmonella* presence in bovine lymph nodes across feeding stages
- Colorado State University** May 2015  
Bachelor of Science: Animal Science

## Professional Experience

- Assistant Professor** August 2022 – Present  
Department of Animal Science, Auburn University
- Postdoctoral Researcher** August 2021 – Present  
Joint Institute for Food Safety and Applied Nutrition  
Supervisor: Dr. Jianghong Meng; jmeng@umd.edu
- Graduate Research Assistant** July 2017 – Present  
Metcalf Lab, Animal Sciences, Colorado State University, Fort Collins, CO  
Supervisor: Dr. Jessica Metcalf; jessica.metcalf@colostate.edu
- Graduate Research/Teaching Assistant** August 2015-June 2017  
Food Microbiology Laboratory, Texas A&M University, College Station, TX  
Meat Science Quality Laboratory, Texas A&M University, College Station, TX  
Supervisor: Dr. Jeff Savell; j-savell@tamu.edu
- Quality Assurance Intern** Summer, 2015  
Breeders and Packers Uruguay, Durazno, Uruguay
- Quality Assurance Intern** Summer, 2014  
Colorado Premium Beef, Greeley, CO
- Undergraduate Research Assistant** January 2013-August 2015  
CSU Center for Meat Safety and Quality, Fort Collins, CO
- Undergraduate Research Assistant** June 2011-May 2015  
CSU Animal Reproduction and Biotechnology Laboratory, Fort Collins, CO

## Publications

### First Author

- Belk, A.D.**, A.N. Frazier, L.K. Fuerniss, R. Delmore, K.E. Belk, B. Borlee, I. Geornaras, J.N. Martin, J.L. Metcalf. 2022. A Pilot Study: The development of a facility-associated microbiome and its association with the presence of *Listeria* spp. in one small meat processing facility. *Microbiology Spectrum*. e02045-22 . DOI: 10.1128/spectrum.02045-22.
- Belk, A.D.**, T. Duarte, C. Quinn, D.A. Coil, K.E. Belk, J.A. Eisen, J.C. Quinn, J.N. Martin, X. Yang, J.L. Metcalf. 2021. Air versus water chilling of chicken: a pilot study of quality, shelf-life, microbial ecology, and economics. *mSystems*. 6(2) e00912-20. DOI: 10.1128/mSystems.00912-20.

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**Belk, A.D.**, H.L. Deel, Z.M. Burcham, R. Knight, D.O. Carter, J.L. Metcalf. 2019. Animal models for understanding microbial decomposition of human remains. *Drug Discover Today: Disease Models* 28. DOI: doi.org/10.1016/j.ddmod.2019.08.013.

**Belk, A.D.**, Xu, Z.Z., Carter, D.O., Lynne, A., Bucheli, S., Knight, R., Metcalf, J.L. 2018. Microbiome data accurately predicts the postmortem interval using Random Forest regression models. *Genes* 9 (104). DOI: 10.3390/genes9020104.

**Belk, A.D.**, Arnold, A.N., Sawyer, J.D., Griffin, D.B., Taylor, T.M., Savell, J.W., Gehring, K.B. 2018. Comparison of *Salmonella* prevalence rates in bovine lymph nodes across feeding stages. *J. Food Prot.* 81(4):549-553. DOI: 10.4315/0362-028X.JFP-17-254.

## **Contributing Author**

Wagoner M.P., T.M. Reyes, V.E. Zorn, M.M. Coursen, K.E. Corbitt, B.S. Wilborn, C.W. Starkey, T.D.

Brandebourg, **A.D. Belk**, T. Bonner, J.T. Sawyer. 2022. Vacuum packaging maintains fresh characteristics of previously frozen beef steaks during simulated retail display. *Foods* 11(19):3012. DOI: 10.3390/foods11193012

Wagoner M.P., T.M. Reyes, V.E. Zorn, M.M. Coursen, K.E. Corbitt, B.S. Wilborn, T.D. Brandebourg, **A.D. Belk**, T. Bonner, J.T. Sawyer. 2022. Influence of vacuum packaging on instrumental surface color characteristics of frozen beef steaks. *Journal of Food Science and Nutrition Research* 5:658-663.

Fuerniss, L.K., H.E. Davis, **A. D. Belk**, J.L. Metcalf, T.E. Engle, J.A. Scanga, F.B. Garry, T.C. Bryant, J.N. Martin. 2022. Liver abscess microbiota of feedlot steers finished in natural and traditional management programs. *Journal of Animal Sciences* skac252. DOI: 10.1093/jas/skac252.

Weinroth, M.D., **A. D. Belk**, C. Dean, N. Noyes, D.K. Dittoe, M.J. Rothrock, Jr., S.C. Ricke, P.R. Myer, M.T. Henniger, G.A. Ramírez, B.B. Oakley, K.L. Summers, A.M. Miles, T.B. Ault-Seay, Z. Yu, J.L. Metcalf, J. Wells. 2022. Considerations and best practices in animal science 16S rRNA gene sequencing microbiome studies. *Journal of Animal Sciences*. 100(2). DOI: doi.org/10.1093/jas/skab346.

Dillon MR, Bolyen E, Adamov A, **A.D. Belk**, Borsom E, Burcham Z, Debelius JW, Deel H, Emmons A, Estaki M, Herman C, Keefe CR, Morton JT, Oliveira RM, Sanchez A, Simard A, Vázquez-Baeza Y, Ziemski M, Miwa, HE, Kerere TA, Coote C, Bonneau R, Knight R, Oliveira G, Gopalasingam P, Kaehler PD, Cope EK, Metcalf JL, Robeson MS, Bokulich NA, Caporaso JG. 2021. Experience and lessons learned from two virtual, hands-on microbiome bioinformatics workshops. *PLOS Comp Bio*.

Arnold, A. N., **A. D. Belk**, K. J. Nickelson, J. E. Sawyer, D. B. Griffin, T. M. Taylor, J. W. Savell, and K. B. Gehring. 2018. Impact of feeding stage, cattle source, and season on *Salmonella* prevalence in bovine lymph nodes. *Proc 64th International Congress of Meat Science and Technology*, Melbourne, Australia.

Weinroth, M. D., **A. D. Belk**, & K. E. Belk. History, Development, and Current Status of Food Safety Systems Worldwide. *Animal Frontiers*. 2018. 8(4) 9-15. DOI: 10.1093/af/vfy016.

Twenter, H., **A.D. Belk**, K.M. Klohonatz, L. Bass, G.J. Bouma, J.E. Bruemmer. 2017. An investigation into miRNAs in the equine epididymis as potential regulators of spermatozoal maturation. *J. Equine Vet Sci*. 48:61-68. DOI: 10.1016/j.jevs.2016.07.023.

# Aerial Belk

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Hergenreder, J., A. Cameron, K.M. Klohonatz, J. da Silveira, **A.D. Belk**, R. Veeramachaneni, G.J. Bouma, J.E. Bruemmer. 2016. Circulating miRNAs as potential alternative cell signaling associated with maternal recognition of pregnancy in the mare. *Biol. Reprod.* 95(6):124, 1-12. DOI:10.1095/biolreprod.116142935.

## **Book Chapters**

Deel, H., Bucheli, S., **Belk, A.**, Ogden, S., Lynne, A., Carter, D. O., Knight, R., Metcalf, J. L. Using microbiome tools for estimating the postmortem interval. In B. Budowle (Eds.) *Microbial Forensics*. Submitted.

## **External Funding**

### **Beef Cattle Production Research Program**

An investigation of the impact of transportation stress on beef microbiomes and pathogen shedding  
Alabama Beef Checkoff Council  
\$10,000  
Sept. 2022 – Sept. 2023

### **Graduate Research Fellowship Program in Science, Technology, Engineering and Mathematics**

Improving Machine Learning Methods for Predicting the Postmortem Interval Using Microbiome Data  
National Institutes of Justice  
Award number: 2018-R2-CX-0017  
\$150,000  
Jan. 2019 – Dec. 2021

### **Generating, Analyzing, and Using Sensory and Sequencing Information Fellowship**

National Science Foundation and CSU Office of the Vice President of Research  
Award number: DGE-1450032  
\$32,000  
July 2018 – June 2019

## **Seminars and Presentations**

Colorado State University Graduate Student Showcase. Nov. 16, 2020. “The Microbiome of a Newly Constructed Meat Processing Facility”. Fort Collins, CO. *Poster Presentation*.

International Congress of Meat Science and Technology PhD Research Competition. Aug 3, 2020. “The microbiome of a newly constructed meat processing facility differs based on room function and time”. Virtual. *Poster Presentation*.

Colorado State University Three-Minute Thesis Competition. Feb. 8, 2020. “The impact of chilling method on the chicken microbiome”. Fort Collins, CO. *Lighting Talk*.

Colorado State University Graduate Student Showcase. Nov. 12, 2019. “The impact of chilling method on chicken microbiome and quality”. Fort Collins, CO. *Poster Presentation*.

International Symposium on Human Identification. Sept. 2019. “Using Microbiome Tools to Estimate the Postmortem Interval of Human Remains”. Palm Springs, CA. *Panelist*.

2019 Reciprocal Meat Conference. June 25, 2019. “How Computer Science Can Be Used in Combination with Meat Science”. Fort Collins, CO. *Invited talk*.

2019 Reciprocal Meat Conference. June 23, 2019. “Utilizing Microbiome and Bioinformatic Tools to Reduce Food Waste in Poultry”. Fort Collins, CO. *Poster Presentation*.

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JBS-CSU Graduate Research Symposium. May 23, 2019. "Using Microbiome and Bioinformatic Tools to Reduce Food Waste in Poultry". Fort Collins, CO. *Oral Presentation*.

1<sup>st</sup> Annual Front Range Microbiome Symposium. April 24, 2019. "Building a microbial model to estimate the postmortem interval using data collected during the spring season at three anthropological facilities". Fort Collins, CO. *Poster Presentation*.

71<sup>st</sup> Annual Meeting of the American Academy of Forensic Sciences. February 21, 2019, 4:30pm. "Building a Microbial Model to Estimate the Postmortem Interval Using Data Collected During the Spring Season at Three Anthropological Facilities". **Aeriel D Belk**, Heather Deel, David O. Carter, Sibyl Bucheli, Aaron Lynne, Melissa Conner, Dawnie Steadman, Giovanna Vidoli, Rob Knight, Jessica L. Metcalf. Baltimore, MD.

71<sup>st</sup> Annual Meeting of the American Academy of Forensic Sciences. February 18, 2019. "Stakeholder Meeting for Estimating the Postmortem Interval Using Microbes: Active to Advanced Decay". Baltimore, MD. *Oral Presentation*.

Colorado State University Graduate Student Showcase, Nov. 13, 2018; "Using the Microbiome to Estimate the Postmortem Interval." Fort Collins, CO. *Poster Presentation*.

American Society of Microbiology: Rocky Mountain Branch Meeting, Nov. 10, 2018; "Using the Skin and Gravesoil Microbiome to Estimate the Postmortem Interval of Human Remains". Fort Collins, CO. *Oral Presentation*.

Colorado State University GAUSSI Symposium, June 25, 2018; "Investigating the microbial, sensory, and physiochemical differences between air and water chilled chicken carcasses." *Lightning Talk*.

Colorado State University Meat Science Seminar, Nov. 13, 2017; "The development of microbial clocks to estimate the postmortem interval of human remains at three anthropological research facilities: Spring season results." *Oral Presentation*.

Colorado State University Graduate Student Showcase, Nov. 9, 2017; "The development of microbial clocks to estimate the postmortem interval of human remains at three anthropological research facilities." *Poster Presentation*.

Beef Industry Food Safety Council Safety Summit, March 1, 2017; "Comparison of *Salmonella* in the bovine lymph node across feeding stages." San Antonio, TX. *Oral Presentation*.

Beef Industry Food Safety Council Safety Summit, Feb. 28-March 2, 2017; "Comparison of *Salmonella* in the bovine lymph node across feeding stages." San Antonio, TX. *Poster Presentation*.

Texas A&M University Meat Science Seminar, Oct. 21, 2016; "Methods for collecting and processing bovine lymph nodes for *Salmonella* prevalence testing". College Station, TX. *Oral Presentation*.

## **Undergraduate and Graduate Teaching**

### **Graduate Teaching Assistant**

#### **ANEQ505: Introduction to the Microbiome of Animal Systems**

2018 - 2020

*Colorado State University, Fort Collins, CO*

- Assisted with design of course and syllabus
- Provided lectures on various microbiome topics, tutorial, and lab sections

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- Organized data collection and analysis for class research projects

## **DASC/FSTC327: Food Bacteriology Laboratory**

Fall 2016, Spring 2017

*Texas A&M University, College Station, TX*

- Instructed weekly laboratory class sessions
- Prepared supplies for laboratory experiments
- Responsible for grading and student assessment

## **ANSC/FSTC307: Introduction to Meat Science**

Fall 2015 – Spring 2017

*Texas A&M University, College Station, TX*

- Instructed weekly laboratory class sessions
- Substitute lecturer for course lectures

## **ANSC317: Meat Selection, Evaluation, and Grading**

Fall 2015

*Texas A&M University, College Station, TX*

- Taught and assisted with lectures and laboratory sessions
- Traveled with interested students to workshops and competitions

## **Short Courses and Extension Programming**

### **Instructor, QIIME2 Microbiome Analysis Workshop**

2018-2020

*Colorado State University, Fort Collins, CO*

Nov. 19 – 20, 2018

Nov. 18 – 19, 2019

Nov. 23 – 24, 2020

*One Health Institute, University of Bern, Bern, Switzerland*

Aug. 24, 2019

*University of Wyoming, Laramie, WY*

Oct. 24-25, 2019

*National Institutes of Health, Bethesda, MD*

Jan. 8 – 10, 2020

*Sam Houston State University, Huntsville, TX*

Jan 13, 2020

*CZI-CABANA Virtual Workshop*

Oct. 5 – 8, 2020

## **Graduate Assistant, USDA-FSIS Enforcement Investigations and Analysis Officer Training**

2015 – 2017

*Texas A&M University, College Station, TX*

Three Courses

## **Graduate Assistant, HACCP: Beyond Basics**

2015 – 2017

*International HACCP Alliance, College Station, TX*

Four Courses

## **Graduate Assistant, Beef 101/706**

2015 – 2017

*Texas A&M Agrilife Extension, College Station, TX*

Aug., Dec. 2015; Jan., June, Aug, Dec. 2016; Jan. 2017

## **Honors & Awards**

CSU Vice President of Research Fellow

2020 – 2021

CSU Graduate Student Showcase – Outstanding Animal Science Presentation

2020

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CSU Three-Minute Thesis Competition – Award winner	2020
International Congress of Meat Science and Technology Research Competition – 1 <sup>st</sup> place, PhD Division	2020
Reciprocal Meat Conference Graduate Research Competition – 1 <sup>st</sup> place, PhD Division	2019
JBS-CSU Graduate Research Competition – 1 <sup>st</sup> place, PhD Division	2019
American Society for Microbiology Science Teaching Fellow	2016 – 2017
Texas A&M Zerle Carpenter Outstanding Graduate Student in Meat Science	2016
Texas A&M Excellence Fellow	2015 – 2016
Bob Ondrusek Memorial Scholarship	2015
North American Meat Institute Scholarship Recipient	2014
CSU Outstanding Animal Science Senior	2014
CSU Outstanding Animal Science Sophomore	2012

## Leadership and Service

### External

Peer Review	2020 – Present
mSystems	
mSphere	
Frontiers in Water	
Meat and Muscle Biology	
Translational Animal Science	
American Meat Science Association Student Committee Member	2015– 2019

### Academic

CSU Graduate Researchers Across Microbiomes	2018 – 2021
Co-Founder, Co-Chair	
CSU Bioinformatics Club	2018 – 2021
CSU Graduate Student Council	2018 – 2021
CSU Microbiome Network	2017 – 2020
CSU Cyberbiosecurity Core	2017 – 2018
CSU Animal Science Graduate Student Association:	2017 – 2021
Vice President, 2018 – 2019	
President, 2019-2020	
Texas A&M Meat Science Quiz Bowl Team: Coach	2017
Texas A&M Animal Science Graduate Student Association:	2015 – 2017
Meat Science Section Representative, Graduate Association Representative	
Texas A&M Meat Judging Team: Assistant Coach	2015 – 2016
CSU Meat Animal Evaluation Team Member	2015
CSU Meat Judging Team Member	2012 – 2013

## Professional Affiliations

American Society for Microbiology	2016 – Present
Colorado Cattleman's Association	2014 – Present
American Meat Science Association	2013 – Present

## Special Trainings and Certificates

British Retail Consortium Certification	2020
Strategies and Techniques for Analyzing Microbial Population Structures (STAMPS) Course	2018
Colorado Beef Quality Assurance Certified	2018
Biosafety Level II Certified	2014
Produce Safety Training	2017

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Hazard Analysis of Critical Control Points (HACCP) trained

2016