Logan Gregory Johnson

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EDUCATION

Ph.D. in Meat Science **May 2021 – Expected May 2024**
Iowa State University (ISU), Ames, IA
Major: Meat Science (GPA: 3.9/4.0)
Certificate: Data Driven Food, Energy, and Water Decision Making
Major Professor: Dr. Steven Lonergan

M.Sc. in Meat Science **January 2019 – May 2021**
Iowa State University, Ames, IA
Major: Meat Science (GPA: 3.89/4.0)
Thesis: "Functional characteristics of peroxiredoxin-2 from porcine skeletal muscle."
Major Professor: Dr. Steven Lonergan

B.Sc. in Food Science **August 2014 – December 2018**
South Dakota State University (SDSU), Brookings, SD
Major: Food Science (GPA: 3.59/4.0)

RESEARCH FOCUS

My research focuses on improving the quality of fresh pork products by evaluating and defining the molecular features of commercial fresh pork loins with more advanced mass spectrometry methods. These enhanced analyses can allow us to define the biochemical connections associated with fresh pork quality. Ultimately, my research aims to predict pork quality to sort and add value to commercial pork loins and provide consumers with a more consistent fresh pork product.

RESEARCH EXPERIENCES

Graduate Research Assistant **January 2019 – Expected May 2024**
Department of Animal Science, ISU, Ames, IA

- Developed and published a method using column chromatography to purify peroxiredoxin-2 from skeletal muscle
- Designed *in vitro* experiments to evaluate conditions that induce changes in peroxiredoxin-2
- Evaluated measures of pork loin quality and collected samples for muscle protein extractions
- Prepared protein and metabolites for analysis by mass spectrometry
- Proficient at preparing SDS-PAGE gels and conducting immunoblotting for protein analysis
- Created a workflow to analyze data from proteomic and metabolomic experiments using R and RStudio

Research Laboratory Assistant **July 2018 – December 2018**
Department of Animal Science, SDSU, Brookings, SD

- Assisted in collecting temperature and pH decline data from commercial beef carcasses over a 5-week collection period
- Collected and fabricated strip loins for Warner-Bratzler shear force measurements
- Independently extracted whole muscle proteins and analyzed troponin-T and calpain-1 using Western blotting techniques

TEACHING EXPERIENCES

Graduate Teaching Assistant
Department of Animal Science, ISU, Ames, IA

AN S 360 (3 credits)
Fresh Meat Science and Applied Muscle Biology

- Coordinated and lead all aspects of eight class demonstrations in the ISU Meat Laboratory during the Fall 2019, Fall 2020, and Spring 2022 semesters (Total Students: 50)
- Developed and facilitated a semester-long term paper and video project on real-world challenges in the meat industry and worked individually with students on questions
- Created and graded eight homework assignments related to laboratory demonstrations, assisted students' during weekly office hours
- Produced video recordings of laboratory demonstrations for online students during the COVID-19 pandemic

AN S 490C (2 credits)
Meat Science Quiz Bowl

- Co-taught a meat science quiz bowl course meeting twice weekly during the Spring 2020 semester (Total Students: 7)
- Developed handouts and presentations of information related to all aspects of meat science
- Created and graded weekly homework and quizzes
- Successfully transitioned to online in the middle of the semester due to the COVID-19 pandemic which led to the students' participation and competition at the 2020 Reciprocal Meats Conference

WORK EXPERIENCE

Research and Development Intern **May 2017 – August 2017**
Well's Enterprises, Inc, Le Mars, IA

- Solved ingredient supply issues by independently manufacturing ice creams and other frozen novelty products using new ingredients
- Assisted in the production of large batch test runs of ice cream products prior to scaling up production in a commercial plant
- Adjusted ice cream product formulations that were ultimately pushed to commercial production

Operations Intern **May 2016 – August 2016**
Empirical Foods, South Sioux City, NE

- Investigated and organized a summary of the water systems and end users of all water types
- Researched and collaborated with an external advisor to summarize best practices and recommendations for improving the water system, leading to financial investment in equipment
- Designed and implemented best practices for testing and maintenance of water quality and systems

PUBLICATIONS

Journal Articles **(Total: 7)**

1. Zhai, C., S.M. Lonergan, E. Huff-Lonergan, **L.G. Johnson**, K. Brown, J.E. Prenni, M.N. Nair. 2023. Lipid peroxidation products influence calpain-1 functionality in vitro by covalent binding. *Journal of Agriculture and Food Chemistry*. Submitted for Review.

2. **Johnson, L.G.**, C. Zhai, L.M. Reever, K.J. Prusa, M.N. Nair, E. Huff-Lonergan, and S.M. Lonergan. 2023. Characterizing the sarcoplasmic proteome of aged pork chops classified by purge loss. *Journal of Animal Science*. https://doi.org/10.1093/jas/skad046. Accepted for Publication.

3. **Johnson, L.G.,** B.M. Patterson, S.M. Lonergan, and E. Huff-Lonergan. 2022. Review of postmortem protein oxidation in skeletal muscle and the role of the peroxiredoxin family of endogenous antioxidants. *Meat and Muscle Biology* 6(3), 1-18. https://doi.org/10.22175/mmb.14492.

4. **Johnson, L.G.,** E.M. Steadham, E. Huff-Lonergan, and S.M. Lonergan. 2021. Partial purification of peroxiredoxin-2 from porcine skeletal muscle. *Meat and Muscle Biology* 5(1): 29, 1-9. https://doi.org/10.22175/mmb.12408

5. Patterson, B.M., A.C. Outhouse, E.T. Helm, **L. Johnson**, E.M. Steadham, J.C.M. Dekkers, K.J. Schwartz, N.K. Gabler, S.M. Lonergan, and E. Huff-Lonergan. 2021. Novel observations of peroxiredoxin-2 profile and protein oxidation in skeletal muscle from pigs of differing residual feed intake and health status. *Meat and Muscle Biology* 5(1): 23, 1-15. https://doi.org/10.22175/mmb.12241

6. Schulte, M.D., **L.G. Johnson**, E.A. Zuber, E.M. Steadham, D.A. King, E. Huff-Lonergan, S.M. Lonergan. 2020. Investigation of the sarcoplasmic proteome contribution to the development of pork loin tenderness. *Meat and Muscle Biology* 4(1): 8, 1-14. https://doi.org/10.22175/mmb.9566

7. Schulte, M.D., **L. G. Johnson**, E.A. Zuber, B.M. Patterson, A.C. Outhouse, C.A. Fedler, E.M. Steadham, D.A. King, K.J. Prusa, E. Huff-Lonergan, and S.M. Lonergan. 2019. Influence of postmortem aging and post-aging freezing on pork loin quality attributes. *Meat and Muscle Biology* 3:313-323. https://doi.org/10.22175/mmb2019.05.0015

Conference Proceedings **(Total: 14)**

1. Lonergan, S.M., **L.G. Johnson**, C. Zhai, E. Huff-Lonergan, K. Prusa, J. Prenni, J. Chaparro, E. Steadham, and M. Nair. Proteomic and metabolomic profiles are associated with fresh pork loin quality phenotypes. ASAS-CSAS Annual Meeting, Oklahoma City, OK, June 26–30, 2022.

2. **Johnson, L.G.** C. Zhai, E.M. Steadham, M.N. Nair, E. Huff-Lonergan, and S.M. Lonergan. Exposure of calpain-2 to different lipid oxidation products affects activity and autolysis. The 75th Reciprocal Meat Conference, Des Moines, IA, June 12–15, 2022.

3. **Johnson, L.G.**, C. Zhai, L.M. Reever, K.J. Prusa, M.N. Nair, E. Huff-Lonergan, and S.M. Lonergan. 2023. Characterizing the proteome of aged pork chops classified by purge loss. The 75th Reciprocal Meat Conference, Des Moines, IA, June 12–15, 2022.

4. Lonergan, S., E. Huff-Lonergan, **L.G. Johnson**, C. Zhai, E. Steadham, K.J. Prusa, L. Reever, J.M. Chaparro, J.E. Prenni, and M.N. Nair. Distinct proteomic and metabolomic profiles are associated with the instrumental texture of aged pork loin. The 75th Reciprocal Meat Conference, Des Moines, IA, June 12–15, 2022.

5. Zhai, C., S.M. Lonergan, E. Huff-Lonergan, **L.G. Johnson**, E.M. Steadham, K. Brown, J. Prenni, and M.N. Nair. Lipid peroxidation products influence calpain-1 activity and autolysis *in vitro*. The 75th Reciprocal Meat Conference, Des Moines, IA, June 12–15, 2022.

6. Zhai, C., S.M. Lonergan, E. Huff-Lonergan, **L.G. Johnson**, E. Steadham, K.J. Prusa, L. Reever, J.M. Chaparro, J.E. Prenni, and M.N. Nair. Tandem mass tag labeling and gas chromatography-mass spectrometry to identify soluble proteome and metabolome variation among pork *longissimus* with differing instrumental color. The 75th Reciprocal Meat Conference, Des Moines, IA, June 12–15, 2022.

7. Stowater, J., K. Prusa, L. Reever, R. Tarte, D. Green, E. Zuber-McQuillen, **L.G. Johnson**, K. Stalder, E. Steadham, E. Huff-Lonergan, and S. Lonergan. Fresh pork loin lipid determination using CEM Oracle and Soxhlet methodology. The 75th Reciprocal Meat Conference, Des Moines, IA, June 12–15, 2022.

8. Stowater, J., K. Prusa, L. Reever, **L.G. Johnson**, K. Stalder, E. Steadham, E. Huff-Lonergan, and S. Lonergan. Utility of pork quality and composition to predict sensory quality in fresh pork loin chops. The 75th Reciprocal Meat Conference, Des Moines, IA, June 12–15, 2022.

9. **Johnson, L.G.**, E.M. Steadham, E. Huff-Lonergan, and S.M Lonergan. 2021. Functional characteristics of peroxiredoxin-2 under *in vitro* conditions mimicking early postmortem skeletal muscle. The 74th Reciprocal Meat Conference, Reno, NV, August 14–18, 2021.

10. **Johnson, L.G.**, M.D. Schulte, E.M. Steadham, K.J. Stalder, E. Huff-Lonergan, and S.M. Lonergan. 2020. Reduced and non-reduced peroxiredoxin-2 profile aged pork loins classified by instrumental star probe. Meat and Muscle Biology 5(2): 128–129. doi:10.22175/mmb.11683

11. **Johnson, L.G.**, E.M. Steadham, E. Huff-Lonergan, and S.M. Lonergan. 2020. Methods for the partial purification of peroxiredoxin-2 in porcine skeletal muscle. Meat and Muscle Biology 5(2): 132–132. doi:10.22175/mmb.11683

12. Zhang, Y., **L.G. Johnson**, E.M. Steadham, E. Huff-Lonergan, and S.M. Lonergan. 2020. Effect of tenderness classification and aging time on abundance of peroxiredoxin-6 in porcine longissimus. Meat and Muscle Biology 5(2): 84–85. doi:10.22175/mmb.11683

13. **Johnson, L.G.**, M.D. Schulte, E.A. Zuber, E.M. Steadham, C.A. Fedler, K.J. Prusa, D.A. King, E. Huff-Lonergan, and S.M. Lonergan. 2019. Contribution of protein degradation and sarcomere length to aged pork loin warner-bratzler shear force. Meat and Muscle Biology 3(2): 91–91. doi:10.22175/mmb.10843

14. **Johnson, L.G.**, J.K. Grubbs, K.R. Underwood, M.J. Webb, and A.D. Blair. 2019. Influence of beef production system technology on calpain-1 autolysis and troponin-T degradation. Meat and Muscle Biology 3(2): 83–83. doi:10.22175/mmb.10726

CONFERENCE PRESENTATIONS

Oral Presentations **(Total: 1)**

1. **Johnson, L.G.** Identification of myofibrillar proteins linked to fresh pork water-holding capacity variation. Flash Talk at 4th Annual North American Mass Spectrometry Summer School, Madison, WI, June 20–23, 2022.

INVITED TALK

1. Meat Science Seminar, Colorado State University, Fort Collins, CO (November 8, 2021). Title: Functional characteristics of peroxiredoxin-2 from porcine skeletal muscle.

HONORS & AWARDS

Scholarship

- David and Jacqueline Topel Scholarship in Meat Science **2022**
- Ron Gustafson Scholarship by North American Meat Institute **2021**
- Robert E. and Dorothy B. Rust Graduate Scholarship in Meat Science **2020**
- Linville International Catalyst Fund Scholarship **2018**
- David A. Thompson Manufacturing/Food Scholarship **2017**

Award

- 2nd Place Master's Research Poster Competition at the "73rd Annual Reciprocal Meat Science Conference" by the American Meat Science Association. (June 2021)

TRAVEL GRANTS

Robert Cassens Ph.D. Scholar Award for the "73rd Annual Reciprocal Meat Science Conference" by the American Meat Science Association. $1,600 (June 2021)

SERVICES & LEADERSHIPS

Treasurer of ISU Association of Graduate Animal Scientists (AGAS) **April 2021 – Present**

- Managed and processed all transactions and deposits from club activities and fundraisers
- Improved the application process for the club scholarship for graduate members

Fundraising Co-Chair of ISU AGAS **April 2019 – April 2020**

- Created a new trivia fundraiser that brought together club members and the department that ultimately raised close to $800 for the club to support graduate member scholarships

President of ISU Meat Science Club **August 2021 – December 2021**

- Increased the membership of the club through undergraduate recruitment and maintained these students as members by improving the quality of communication and events within the club
- Coordinated a major club fundraiser and simultaneously educated club members on the processing of holiday hams, resulting in a profit of close to $2,500 to support students to attend a club and industry tour the next semester

Vice President of ISU Meat Science Club **July 2019 – July 2020**

- Recruited student members to provide approximately 15 education tours of the ISU Meat Laboratory to external stakeholders, extension short course participants, and high school students

PROFESSIONAL MEMBERSHIPS

- Member of the American Meat Science Association **2015 – Present**
- Member of the Gamma Sigma Delta Honor Society of Agriculture **2020 – Present**
- Member of the Phi Tau Sigma Honor Society of Food Science and Technology **2022 – Present**
- Member of the Institute of Food Technologists **2016 – 2018**

SKILLS & TRAININGS

- Hazard Analysis and Critical Control Point (HACCP) Certified
    - ISU Meat Science Extension, October 14–16, 2020.
- Proficient in R programming language