

## Cangliang Shen

Associate Professor/Extension Specialist, Ph.D.  
Division of Animal and Nutritional Sciences  
Room 2423 Agriculture Science Building  
Davis College of Agriculture, Natural Resources & Design  
Families & Community Development, Extension Services  
West Virginia University  
Morgantown, WV 26506-6108, U.S.  
Fax: (304)293-2232  
Office phone: (304)293-2691  
Cell phone: (970)222-2975  
Email: [cangliang.shen@mail.wvu.edu](mailto:cangliang.shen@mail.wvu.edu)/[cashen@mail.wvu.edu](mailto:cashen@mail.wvu.edu)

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### Education

Ph.D. Food Microbiology (Meat Safety) 2006-2009  
Department of Animal Sciences, Center for Meat Safety & Quality,  
Colorado State University, Fort Collins, CO, U.S.

M.S. Veterinary Medicine 2004-2006  
College of Veterinary Medicine, Nanjing Agricultural University, China

Bachelor Veterinary Medicine 2000-2004  
College of Veterinary Medicine, Nanjing Agricultural University, China

### Work and Research Experiences

08/2019-Current **Associate Professor/Extension Specialist**  
(12 m appointment, 40%-Teaching, 40%-Research, and 20%-Extension/Service)

12/2014-08/2019 **Assistant Professor/Extension Specialist**  
Division of Animal and Nutritional Sciences,  
Davis College of Agriculture, Natural Resources & Design, West Virginia University

08/2012-12/2014 **Assistant Professor (Food Microbiologist)**  
Department of Biology, Western Kentucky University, Bowling Green, KY

- Teach and develop externally funded research program in food microbiology
- Classes Teaching:  
2012-2014 Biol226 Microbial Biology & Diversity (24 students/semester)  
2012-2014 Biol227 Lab Microbial Biology & Diversity (24 students/semester)  
2012-2014 Biol208 General Clinical Microbiology (24 students/semester, 2 sections/semester)

Bio 336 Food Microbiology (developed new course)

01/2011-07/2012

**Postdoctoral Research Microbiologist**

USDA-ARS Environmental Microbial and Food Safety Lab, Beltsville, MD

Department of Nutrition and Food Science, University of Maryland at College Park, MD

Research project: "Improving produce safety by stabilizing chlorine in washing solutions with high organic loads" and "Innovative technologies and process optimization for food safety risk reduction associated produce processing"

01/2010-01/2011

**Research Associate**

IEH Laboratories & Consulting Group, Seattle, WA

Job duties: Commercial food pathogen testing using multiplex PCR, validation studies of antimicrobials application on food processing, and research related to lactic acid bacteria

08/2006-12/2009

**Graduate Research Assistant**

Department of Animal Sciences, Center for Meat Safety & Quality, Colorado State University Advisor: Dr. John N. Sofos

Research projects: "Thermal inactivation of *Escherichia coli* O157:H7 on nonintact beef products" and "Antilisterial activities of natural antimicrobials on ready-to-eat meat products"

09/2003-06/2006

**Graduate Research Assistant**

Key Laboratory of Animal Physiology & Biochemistry, Ministry of Agriculture, Nanjing Agricultural University, China

Research project: "Antimicrobial activity and anti-infection effect of hydrolysates from soybean conglycinin against *E. coli* O138 in mice using PCR-DGGE"

**Honors and Awards**

- Outstanding Teaching Award representing Division of Animal & Nutritional Sciences at Davis College of Agriculture, Natural Resources & Design, WVU, 2021
- First Place 2020 FPT Most-Viewed Peer-Review Research Publication Award, 2020
- Outstanding Research Award, Division of Animal & Nutritional Sciences, Davis College, WVU, 2020
- Outstanding Volunteer Award of Food Microbiology Division-Institute of Food Technologists, 2018
- Third Place 2018 John N. Sofos Most-cited JFP Research Publication Award, 2018
- Nominee of Outstanding Teaching Award, Davis College, WVU, 2018
- Chair of Food Microbiology Division, Institute of Food Technologists 2018-2019
- Food Microbiology Division Leadership Travel Grant, Institute of Food Technologists 2014, 2016, 2017, 2018, 2019
- WKU Faculty and Staff Appreciation Award (sponsored by Alpha Omicron Pi) 2014

- Members-at-Large of Food Microbiology Division, Institute of Food Technologist 2013-2015
- 1<sup>st</sup> Place of John C. Ayres Poster Competition Food Microbiology Division, Institute of Food Technologists 2010
- 3<sup>rd</sup> place of Developing Scientist Award, International Association of Food Protection 2009
- Third Prize JBS Swift Company Seminar Student Oral Presentation Competition 2009
- Student Education Award, IFT-Rocky Mountain Branch 2009
- Student Travel Award, IFT-Rocky Mountain Branch 2008
- Graduate Fellowship Award Colorado State University 2006

### **Annual Course Teaching (10 credits/year):**

Fall, **General Microbiology** (4 credits, with 3 lab sections, 102 students)

My Youtube channel link:

[https://www.youtube.com/channel/UCq6\\_ZNp7r8g8Eovf63-eXeg/videos](https://www.youtube.com/channel/UCq6_ZNp7r8g8Eovf63-eXeg/videos)

Spring, **Food Microbiology Lab** (1 credit, developed new course, 15 students)

Spring, **Food Chemistry** (3 credits, developed new course, 15 students)

Spring, **Senior Seminar in Nutrition** (2 credits, team teach, 27 students).

### **List of Graduate Students Advising (1 post-doctor, 5 Ph.D., 11 Master students)**

<b>Name</b>	<b>Degree Role</b>	<b>Time</b>
Yu-Chun Chiu	Short-term Post-doctor	Aug. 2019 to Dec. 2019
Timothy Boltz	Ph.D., Committee member	Fall 2019 to current
Alik Browning	Master, Advisor	Fall 2021 to current
Corey Coe	Master, Advisor	Spring 2020 to Fall 2021
Rebecca Steams	Master to Ph.D., Advisor	Spring 2021 to current
Rachael Starr	Master (non-thesis), Advisor	Spring 2020 to Summer 2021
KaWang Li	Ph.D., Advisor	Fall 2017 to Summer 2021
Wentao Jiang	Ph.D., Advisor	Spring 2018 to Summer 2021
Sean Estep	Master, Committee member	Spring 2021 to current
Marziyeh Horeh	Ph.D., Committee member	Fall 2021 to current
Jessica Lemley	Master, Committee member	Fall 2018 to July 2020
Lacey Lemonakis	Master, Advisor	Fall 2015 to Fall 2018
KaWang Li	Master, Advisor	Fall 2015 to Summer 2017
Shall Andrew	Master (non-thesis), Committee member	Spring 2018 to Spring 2019
Timothy Boltz	Master, Committee member	Fall 2017 to Spring 2019
Dereck Warren	Master, Defense committee member	Fall 2015 to Summer 2017

**Research Interest:** Developing postharvest sanitizing procedures for reducing food safety risks on poultry meat products and fresh produce at both the laboratory and pilot plant levels.

**Research Grants (Career Total budget: \$2,336,369 As PI or Co-PI)**

**USDA-NIFA HATCH GRANT (Non-Competitive Grant)**

1. **Cangliang Shen (PI)**. Inactivation of Foodborne Pathogens by Chemical and Physical Interventions in West Virginia Locally processed Chicken Products and Related Cost-effectiveness Analysis. FY2020-FY2025
2. **Cangliang Shen (PI)**. Control of *Salmonella spp.* in poultry products by physical and chemical treatments. FY2015-FY2020

**Funded External Grants:**

**At WVU (Awards amount to Shen: \$1,147,847)**

1. **Cangliang Shen (PI)**, Xiaoli Etienne, Brett Kenney, Lisa Jones. FY2022-2025. "Improving Microbial Safety and Marketing of West Virginia Locally Pastured Broilers by Establishing a Mobile Poultry Processing Unit Through Research and Extension Activities" USDA, NIFA-AFRI-Critical Agricultural Research and Extension (CARE) Program 2021-09878 (*Award email notice*) Budget: **\$299,192**.
2. Candace DeLong, Brian Wickline, Tom Basden, Josh Peplowski, **Cangliang Shen (Co-PI, senior personnel)**, and Jody Carpenter. FY2022-2024. "Evaluation of WV Pelletized Poultry Litter to Improve Specialty Crop Production" **2021 Sustainable Agriculture Research and Education (SARE) Northeast Partnership Grant. PG21-020. Budget: \$29,944 (\$3,000 distributed to Shen for microbial analysis)**
3. **Cangliang Shen (PI)**, Xiaoli Etienne, Lisa Jones, Annette Freshour. FY2020-2024. "Establishing a Summer Internship Program to Enhance Undergraduate Knowledge and Skills on Food Microbial Safety through Research and Extension Activities" **USDA-NIFA-AFRI Education and Workforce Development Program 2019-05064 (Award #2020-68018-30657) Budget: \$398,997**.
4. **Cangliang Shen (PI)**, Xiaoli Etienne, Lisa Jones. FY2019-2022. "Improving the Microbial Safety and Quality of Locally Grown Produce in West Virginia by Adopting a Three-Step Wash Process with Antimicrobials Through Research and Extension" **USDA, NIFA-AFRI-Critical Agricultural Research and Extension (CARE) Program 2018-09105 (Award #2019-68008-29828) Budget: \$195,730**.
5. Yifan Zhang, **Cangliang Shen (Co-PI)**, Xiaoli Etienne, Lisa Jones. FY2018-2021. "Evaluating Antibiotic Resistance in Locally-Grown Fresh Produce with the Aim to Enhance Urban Food Sustainability" **USDA, NIFA Institute of Family, Youth and Community, Division of Community and Education, Non-Land Grant Colleges of Agriculture (NLGCA) Program-2018-04995 (Award #2018-70001-28938). Budget: \$640,631. Sub-award of \$138,794 from WSU to WVU. FY18-21.**
6. Hanna Khouryieh, **Cangliang Shen (Co-PI)**, Martin Stone. FY2016-2018. "Building Capacity of Food Science Cluster at Western Kentucky University to Control Pathogens on Fresh Produce at Kentucky Farmers' Markets" **USDA, NIFA Institute**

- of Family, Youth and Community, Division of Community and Education, Non-Land Grant Colleges of Agriculture (NLGCA) Program-2016-06589 (Award # 2017-70001-25993). Budget: \$297,278. Sub-award of \$89,184 from WKU to WVU. FY17-18.**
7. **Cangliang Shen (PI)**, Cate Webb, Pauline Norris. FY2015-2017. “Building Teaching and Research Capacity at the Food Science Cluster of Western Kentucky University to Control Salmonella in Chicken Products” **USDA, NIFA Institute of Family, Youth and Community, Division of Community and Education, Non-Land Grant Colleges of Agriculture (NLGCA) Program-2014-09844. Budget: \$149,977. Sub-award of \$14,950 from WKU to WVU. FY15-16.**
  8. Hanna Khouryieh, **Cangliang Shen (Co-PI)**, Martin Stone, Amanda Gipe, and Todd Williams. FY2013-2016. “An integrated approach to enhance the safety of locally grown fresh produce through research and extension” **USDA, NIFA-AFRI Food Safety Program-2012-04320 (Grant #11281827). Budget: \$209,920. Sub-award of \$8,000 from WKU to WVU FY15-16.**

#### **Funded Internal Competitive Grants and Support:**

##### **At WVU**

1. **Cangliang Shen (PI)** and Lewis Jett. 2018-2019. Microbial profile of fresh produce and environmental samples from WVU organic produce farm. Budget: **\$10,000. WVU-Davis College and Extension Unit Faculty Development Seed Grant.**
2. **Cangliang Shen (PI)** and Joseph Moritz. 2016-2017. Pre-harvest and Post-harvest Processing Controls to Reduce *Salmonella* & *Campylobacter* on Chicken products Produced by Mobile Poultry Processing Unit. Budget: **\$16,500. WVU-Senate Research and Scholarship Grant Award R-16-027.**
3. Kang Mo Ku and **Cangliang Shen (Co-PI)**. Survival and attachment mechanism of foodborne pathogens on various leafy green surfaces. Budget: **\$3,000. WVU-School of Agriculture and Food Research Grant.**

##### **Before WVU**

4. **Cangliang Shen** and Amanda Gipe McKeith. 2014-2015. Thermal inactivation of shiga toxin-producing *Escherichia coli* (STEC) in veal products moisture enhanced with essential oils. Budget: **\$8,200. WKU- Research and Creative Activities Program Funding.**
5. **Cangliang Shen** (Faculty Mentor) and Courtney Broyles. 2013. Cooking inactivation of Non-O157 Shiga Toxin-Producing *Escherichia coli* in moisture enhanced non-intact beef by double pan-broiling griller. Budget: **\$5,000. WKU, Faculty – Undergraduate Student Engagement (FUSE) Grant.**
6. Moon-Soo Kim, **Cangliang Shen**, Amanda Gipe McKeith, Jana Fattic, Aaron Celestian, and Pauline Norris. 2013. Evaluation of the efficacy of postharvest chlorine water washing procedures to control foodborne pathogens on fresh produce

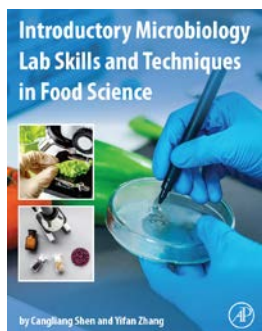
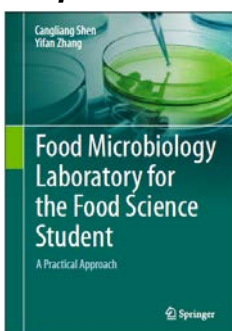
selling at local farmers' markets and development of a zinc finger protein array for on-site detection of foodborne pathogens. **WKU-Applied Research and Technology Program, Collaborative Research Proposal Grants**. Budget: **\$70,000**. Co-PI for produce washing project, budget distributed to Shen: **\$30,000**.

7. **Cangliang Shen** (faculty mentor) and Kelsey Carter. 2013. Control of unstressed or cold, acid or starvation stress-adapted *Listeria monocytogenes* on commercially cured ham by dipping in hops beta acids solutions. **WKU-Biology Department Undergraduate Summer Research Scholarship**. Budget: **\$1,000**.
8. **Cangliang Shen** (faculty mentor) and Alyssa Huff. 2013. Thermal inactivation of unstressed, acid, cold, and starvation stress adapted *Salmonella typhimurium* in raw carrot juice. **WKU-Biology Department Undergraduate Summer Research Scholarship**. Budget: **\$1,000**.

### Publications:

#### Textbooks:

1. **Cangliang Shen** and Yifan Zhang. ***Food Microbiology Laboratory for the Food Science Student: A Practical Approach***. 2017. Springer. •ISBN 978-3-319-58371-6
2. **Cangliang Shen** and Yifan Zhang. ***Introductory Microbiology Lab Skill and Techniques in Food Science***. 2021. Elsevier Inc. ISBN 9780128216781.



#### Book Chapters:

1. **Cangliang Shen** and Matt Taylor. Lauric Arginate Ethyl Ester. In: ***Antimicrobials in Food, Fourth Edition***. Chapter 10, pp 357-371. Editors: Taylor, Davidson, David. Publisher. CRC Group Taylor & Francis Group. ISBN 9780367178789  
<https://doi.org/10.1201/9780429058196>.
2. **Cangliang Shen**. Control of FoodBorne Pathogens by Hops Beta Acids in Food System. In: ***Natural and Bio-Based Antimicrobials for Food Applications***. Chapter 7, pp 133-147. Editors: Xuetong Fan, Helen Ngo, and Changqing Wu. American Chemical Society (ACS) Publisher. Washington D.C. 2018. Volume 1287. ISBN13: 9780841233058.

#### Referred Journal Articles of Research (Total **42**):

##### **At WVU (\*corresponding author)**

1. Timothy Boltz, Joseph Moritz, Victoria Ayres, Casey Showman, Jacek Jaczynski,

- and **Cangliang Shen\***. 2021. Modeling thermal inactivation of *Salmonella* Typhimurium in poultry feed. **Journal of Applied Poultry Research**, 20, Article 100208.
2. Wentao Jiang, Carly Waldman, KaWang Li, Jacek Jaczynski, and **Cangliang Shen\***. 2021. Survival of *Salmonella* and the surrogate *Enterococcus faecium* in Cooking of Moisture Enhanced Reconstructed Comminuted Chicken Patties by Double Pan-broiling. **Poultry Science**, 100, Article 101171.
  3. Wentao Jiang, Sumit K. Paudel, Nirosha Ruwani Amarasekara, Yifan Zhang, Xiaoli Etienne, Lisa Jones, KaWang Li, Fay Hansen, Jacek Jaczynski, and **Cangliang Shen\***. 2021. Survey of Small Local Produce Growers' Perception of Antibiotic Resistance Issues at Farmers Markets. **Food Control**, 125, Article 107997.
  4. KaWang Li, Lisa Jones, Wentao Jiang, and **Cangliang Shen\***. 2021. Inactivation of Foodborne Pathogens (*Salmonella* and *Listeria monocytogenes*) on Locally Processed Spinaches by Three-Step Wash with Antimicrobials. **Journal of Agriculture and Food Research**, 3, Article 100106.
  5. Chuanyan, Che, **Cangliang Shen\***, Shenghe Li, Zhihua Cai, Ren Man, and Xuan Wang. 2020. Effect of *Echinacea purpurea* extract given in drinking water on performance, slaughter variables, and meat quality of Broilers. **ES Food & Agroforestry**, 2, 42-49.
  6. Wentao Jiang, KaWang Li, Yu-Chun Chiu, Carly Waldman, and **Cangliang Shen\***. 2020. Inactivation of *Campylobacter jejuni* in Moisture Enhanced Non-Intact Chicken Patties by Double Pan-broiling as Affected by Cooking Set-Up Temperature and Pump Rate. **LWT - Food Science and Technology**, 133, Article 109938.
  7. Yu-Chun Chiu, **Cangliang Shen**, Mark Farnham, and Kang-Mo Ku. 2020. Three-Dimensional Epicuticular Wax on Plant Surface Reduces Attachment and Survival Rate of *Salmonella* during Storage. **Postharvest Biology and Technology**. 166, Article 111197. (co-first author)
  8. KaWang Li, Yu-Chun Chiu, Lisa Jones, Wentao Jiang, Xiaoli Etienne, and **Cangliang Shen\***. 2020. Comparing the Efficacy of Two Triple-Wash Procedures with Sodium Hypochlorite, Lactic-Citric Acid Blend, and Mix of Peroxyacetic Acid and Hydrogen Peroxide to Inactivate *Salmonella*, *Listeria monocytogenes*, and surrogate *Enterococcus faecium* on Cucumbers and Tomatoes. **Frontiers in Sustainable Food Systems**. 4, 19.
  9. KaWang Li, Xiaoli Etienne, Yu-Chun Chiu, Lisa Jones, Hanna Khouryieh, and **Cangliang Shen\***. 2020. Validation of triple-wash procedure with a H<sub>2</sub>O<sub>2</sub>-peroxyacetic acid mixer to improve microbial safety and quality of butternut squashes and economic feasibility analysis. **Food Control**. 112, Article 107146.
  10. Kang-Mo Ku, Yu-Chun Chiu, **Cangliang Shen**, and Matthew Jenks. 2020. Leaf cuticular waxes of lettuce are associated with reduced attachment of the foodborne pathogen *Salmonella* spp. at harvest and after postharvest storage. **LWT - Food Science and Technology**. 117, Article 108657.

11. Tim Boltz, John Boney, **Cangliang Shen**, Jacek Jaczynski, and Joe S. Moritz. 2019. The Effect of Standard Pelleting and More Thermally Aggressive Pelleting Utilizing a Hygieniser on Feed Manufacture and Reduction of *Enterococcus faecium*, a *Salmonella* Surrogate. **The Journal of Applied Poultry Research**. 28: 1226-1233.
12. Marlain Khouryieh, Hanna Khouryieh, Jerry K. Daday, and **Cangliang Shen**. 2019 Consumers' perceptions of the safety of fresh produce sold at farmers' markets. **Food Control**. 105:242-247.
13. **Cangliang Shen\***, Lacey Lemonakis, Xiaoli Etienne, KaWang Li, Wentao Jiang, and Jeremy Adler. 2019. Evaluation of commercial antimicrobials against stress-adapted *Campylobacter jejuni* on broiler wings by using immersion and electrostatic spray and an economic feasibility analysis. **Food Control**. 103:161-166.
14. Wentao Jiang, Xiaoli Etienne, KaWang Li, **Cangliang Shen\***. 2018. Comparison of the efficacy of electrostatic versus conventional sprayer with commercial antimicrobials to inactivate *Salmonella*, *Listeria monocytogenes* and *Campylobacter jejuni* for eggs and economic feasibility analysis. **Journal of Food Protection**. 81:1864-1870.
15. KaWang Li, Hanna Khouryieh, Lisa Jones, Xiaoli Etienne, and **Cangliang Shen\***. 2018. Assessing Farmers Market Produce Vendors' Handling of Containers and Evaluation of the Survival of *Salmonella* and *Listeria monocytogenes* on Plastic, Pressed-Card, and Wood Container Surfaces at Refrigerated and Room Temperature. **Food Control**. 94: 116-122.
16. Daniel Sinkel, Hanna Khouryieh, Jerry Daday, Martin Stone, and **Cangliang Shen**. 2018. Knowledge and implementation of Good Agricultural Practices among small-scale Kentucky fresh produce farmers. **Food Protection Trends**. 36: 111-121.
17. KaWang Li, Amanda Gipe McKeith, **Cangliang Shen\***, Russell McKeith. 2018. A Comparison Study of Quality Attributes of Ground Beef and Veal Patties and Thermal Inactivation of *Escherichia Coli* O157:H7 after Double Pan-Broiling Under Dynamic Conditions. **Foods**. 7(1): 1-13.
18. Lacey Lemonakis, KaWang Li, Jeremy Adler, and **Cangliang Shen\***. 2017. Microbiological quality assessment and validation of antimicrobials against unstressed or cold-stress adapted *Salmonella* and surrogate *Enterococcus faecium* on broiler carcasses and wings. **Poultry Science**. 86: 4038-4045.
19. KaWang Li, Lacey Lemonakis, Brian Glover, Joe Moritz, and **Cangliang Shen\***. 2017. Impact of built up litter and commercial antimicrobials on *Salmonella* and *Campylobacter* contamination of broiler carcasses processed at a pilot mobile poultry processing unit. **Frontiers in Veterinary Science**. 4:88.
20. KaWang Li, Jennifer Weidhaas, Lacey Lemonakis, Hanna Khouryieh, Martin Stone, Lisa Jones, and **Cangliang Shen\***. 2017. Microbiological Quality and Safety of Fresh Produce in West Virginia and Kentucky Farmers' Markets and Validation of a Post-harvest Washing Practice with Antimicrobials to Inactivate *Salmonella* and *Listeria monocytogenes*. **Food Control**. 79:101-108.



21. Jeremy Adler, Erin Cain-Helfrich, and **Cangliang Shen\***. 2016. Reductions in Natural Microbial Flora, Generic *Escherichia coli* and Pathogenic *Salmonella* on Jalapeno Peppers Processed in a Commercial Antimicrobial Cabinet-A Pilot Plant Trial. ***Journal of Food Protection***. 79: 1854-1859.
22. **Cangliang Shen\***, Amanda McKeith, Courtney Broyles, and Russell McKeith. 2016. Quality attributes and thermal inactivation of shiga toxin-producing *Escherichia coli* in moisture enhanced, non-intact beef products are affected by pump rate, internal temperature, and resting time after cooking. ***Food Control***. 68:112-117.
23. Li Wang, Amanda McKeith, **Cangliang Shen\***, Kelsey Carter, Alyssa Huff, Russell McKeith, Xinxia Zhang, and Zhengxing Chen. 2016. Effect of hops beta acids on survival of unstressed-, acid-stress adapted *Listeria monocytogenes*, quality and sensory attributes of commercially cured ham. ***Journal of Food Science***. 81:M445-M453. (co-first author)
24. **Cangliang Shen**, Pauline Norris, Olivia Williams, Stephanie Hagan, and KaWang Li. 2016. Generation of chlorine by-products in simulated wash water. ***Food Chemistry***. 190: 97-102.
25. Li Wang and **Cangliang Shen\***. 2015. Survival of unstressed, acid-, cold-, and starvation-stress-adapted *Listeria monocytogenes* in ham extract with hops beta acids (HBA) and consumer acceptability of HBA on ready-to-eat ham. ***BioMed Research International***. (Special issue, article ID 817042)

#### **Before WVU**

26. **Cangliang Shen**. 2014. Cooking inactivation of shiga toxin producing *Escherichia coli* (STEC) in non-intact beefs-a mini-review. ***Journal of Food Processing & Beverages***. 2:1-5.
27. **Cangliang Shen**. 2014. Evaluation of chlorine efficacy against *Escherichia coli* O157:H7 survival and cross-contamination during continuous produce washing process with water quality change. ***International Journal of Food Science, Nutrition, and Dietetics***. 3:201-207.
28. **Cangliang Shen**, Yaguang Luo, Xiangwu Nou, Qin Wang, and Patricia Millner. 2013. Dynamic effects of free chlorine concentration, organic load, and exposure time on the inactivation of *Salmonella*, *Escherichia coli* O157:H7 and Non-O157 Shiga Toxin-Producing *E. coli*. ***Journal of Food Protection***. 76:386-393.
29. Yaguang Luo, Xiangwu Nou, Patricia Millner, Bin Zhou, **Cangliang Shen**, Yang Yang, Yunpeng Wu, Qin Wang, Hao Feng, and Dan Shelton. 2012. A pilot plant scale evaluation of a new process aid for enhancing chlorine efficacy against pathogen survival and cross-contamination during produce wash. ***International Journal of Food Microbiology***. 158: 133-139.
30. **Cangliang Shen**, Yaguang Luo, Xiangwu Nou, Gary Bauchan, Bin Zhou, Qin Wang, and Patricia Millner. 2012. Fresh produce washing aid, T-128, enhances inactivation

- of Salmonella and Pseudomonas biofilms on stainless steel coupons in chlorinated wash solutions. ***Applied and Environmental Microbiology***. 78:6789-6798.
31. **Cangliang Shen**, Ifigenia Geornaras, Keith E. Belk, Gary C. Smith and John N. Sofos. 2011. Thermal inactivation of acid, cold, heat, starvation and desiccation stress-adapted *Escherichia coli* O157:H7 in nonintact beef moisture-enhanced with various brine ingredients. ***Journal of Food Protection***.74: 531-538
  32. **Cangliang Shen**, Ifigenia Geornaras, Patricia A. Kendall and John N. Sofos. 2011. Evaluation of microwave oven heating and salad dressings to control *Listeria monocytogenes* on diced ham and turkey breast. ***Food Protection Trends***. March: 16-23
  33. **Cangliang Shen**, Ifigenia Geornaras, Keith E. Belk, Gary C. Smith and John N. Sofos. 2010. Inactivation of *Escherichia coli* O157:H7 in moisture-enhanced nonintact beef by pan-broiling or roasting with various cooking appliances set at different temperatures. ***Journal of Food Science***.76: 64-71.
  34. **Cangliang Shen**, Jeremy M. Adler, Ifigenia Geornaras, Keith E. Belk, Gary C. Smith and John N. Sofos. 2010. Inactivation of *Escherichia coli* O157:H7 in nonintact beef steaks of different thicknesses by pan-broiling, double pan-broiling or roasting by using five types of cooking equipment. ***Journal of Food Protection***.73: 461-469.
  35. **Cangliang Shen**, Ifigenia Geornaras, Patricia A. Kendall and John N. Sofos. 2009. Antilisterial activities of salad dressings, without or with prior microwave oven heating, on frankfurters during simulated home storage. ***International Journal of Food Microbiology***. 132: 9-13.
  36. **Cangliang Shen**, Ifigenia Geornaras, Patricia A. Kendall and John N. Sofos. 2009. Control of *listeria monocytogenes* on frankfurters by dipping in hops beta acids solutions. ***Journal of Food Protection***.72: 702-709.
  37. **Cangliang Shen**, and John N. Sofos. 2008. Antilisterial activity of hops beta acids in broth with or without other antimicrobials. ***Journal of Food Science***.73: 438-442.
  38. **Cangliang Shen**, Weihua Chen, and Sixiang Zou. 2007. *In vitro* and *in vivo* effects of hydrolysates from conglycinin on intestinal microbial community of mice after *E. coli* infection. ***Journal of Applied Microbiology***.102: 283-289.
  39. **Cangliang Shen**, Wen Yao, Weihua Chen, Weiyun Zhu, and Sixiang Zou. 2006. Effect of conglycinin pepsin hydrolysates on intestinal bacterial community and health in mice after feeding *E. coli*. ***China Journal of Modern Medicine***.16: 354-361.
  40. Xiaodong Zhu, and **Cangliang Shen**. 2006. The research progress of soybean protein. ***China feed additives***. 9: 10-12.
  41. Xiaodong Zhu, and **Cangliang Shen**. 2006. The research progress of bioactive peptide. ***China feed additives***. 11: 9-12.
  42. **Cangliang Shen**, Weihua Chen, and Sixiang Zou. 2005. Anti-infection of hydrolysates from conglycinin on *E. coli* of mice. ***World Chinese Journal of Digestology***.13: 1299-1304.

### Research reports:

1. **Cangliang Shen** and John N. Sofos. 2007. Activity of hops beta acids. Animal Sciences Research Report, Department of Animal Sciences, Colorado State University, Fort Collins, CO.
2. Ifigenia Geornaras, Nikos Chorianopoulos, Kyung Yuk Ko, Jeremy M. Adler, Oleksandr A. Byelashov, Shivani Gupta, **Cangliang Shen**, Keith E. Belk, Gary C. Smith, John N. Sofos. 2009. Effect of traditional and modified enhancement solution ingredients on survival of *Escherichia coli* O157:H7 during storage and cooking of moisture-enhanced beef. Final report submitted to American Meat Institution Foundation, Washington, DC.
3. Yaguang Luo, Daniel Shelton, Patricia Millner, Xiangwu Nou. 2011. Improving produce safety by stabilizing chlorine in washing solutions with high organic loads. Final report submitted to CPS, prepared and written by **Cangliang Shen**.

### Invited Presentations:

1. **Cangliang Shen**. “Bacterial Genetics-DNA replication, transcription, translation, and *lac* operon” Animal Biochemistry Class, **Nanjing Agricultural University, China**, Nov-Dec, 2021 (Virtual Video) (Invited by Dr. Yuanshu Zhang)
2. **Cangliang Shen**. “Overview of Bacterial Food Safety in U.S. and Research/Extension Activities”, FDSC 624 Current Food Safety Issues Class, **University of McGill, Canada**, Nov 5<sup>th</sup>, 2020 (Virtual Video) (Invited by Dr. Xiaonan Lu)
3. **Cangliang Shen**. “Improving Microbial Safety of West Virginia Locally Grown Foods by Physical and Chemical Interventions-Research Updates”, **USDA-ARS, Wyndmoor, PA**, March 20th, 2018. (Invited by Dr. Joshua Gurtler)

### National and International Conference Abstracts (63):

#### At WVU (43)

1. Tim Boltz, Victoria Ayres, **Cangliang Shen**, and Joe Moritz. Modeling the thermal inactivation of *Salmonella* reduction in poultry feed in a lab-based water bath. **2021 Poultry Science Association Annual Meeting, July 19-22<sup>nd</sup> (Virtual)**. (\*Graduate’s work in my lab)
2. Wentao Jiang, Carly Waldman, and **Cangliang Shen**. Impact of Set-up Temperatures and Pump Rates for survivals of *Salmonella* and the surrogate *Enterococcus faecium* in Moisture Enhanced Reconstructed Chicken Patties after Double Pan-broiling. **2021 Annual Meeting of the International Association of Food Protection. July 18-21, Phoenix, Arizona** (\*Graduate’s work in my lab).
3. Corey Coe, Rebecca Stearns, Lisa Jones, and **Cangliang Shen**. Evaluate the efficacy of a mixture of peroxyacetic acid and H<sub>2</sub>O<sub>2</sub> against the survival and cross-contamination of the *Salmonella* surrogate *Enterococcus faecium* on tomatoes during triple-wash. **2021 Annual Meeting of the International Association of**

- Food Protection. July 18-21, Phoenix, Arizona** (\*Graduate's work in my lab).
4. Sumit K. Paudel, Nirosha Ruwani Amarasekara, Amrita Subramanya Swamy, Mohamad Alasadi, Ka Wang Li, Wentao Jiang, **Cangliang Shen** and Yifan Zhang. Isolation of Salmonella Spp. from Fresh Produce Sold at Farmers' Market and Urban Gardens. **2021 Annual Meeting of the International Association of Food Protection. July 18-21, Phoenix, Arizona**
  5. Nirosha Ruwani Amarasekara, Sumit K. Paudel, Amrita Subramanya Swamy, Mohamad Alasadi, Ka Wang Li, Wentao Jiang, **Cangliang Shen** and Yifan Zhang. Microbial Prevalence of Listeria in Fresh Produce and Virulence Gene Distribution in *L. monocytogenes*. **2021 Annual Meeting of the International Association of Food Protection. July 18-21, Phoenix, Arizona**
  6. **Cangliang Shen**, KaWang Li, Wentao Jiang, Lisa Jones, and Yifan Zhang. Survey of Consumers' knowledge of Microbial Food Safety of Fresh Produce Purchased at Local Farmers Market. **2021 Annual Meeting of the Institute of Food Technologists. July 19-21, Chicago, IL. (Virtual)**
  7. KaWang Li, Wentao Jiang, Lisa Jones, and **Cangliang Shen**. Validation of Triple-Wash Procedures with Sodium Hypochlorite, Lactic-Citric Acid Blend, and Mixer of Peroxyacetic Acid-Hydrogen Peroxide to Inactivate *Salmonella*, *Listeria monocytogenes*, and surrogate *Enterococcus faecium* on Cucumbers and Tomatoes. **2020 Annual Meeting of the International Association of Food Protection.** Oct. 26-28, Cleveland, Ohio (\*Graduate's work in my lab).
  8. Wentao Jiang, KaWang Li, and **Cangliang Shen**. Thermal Inactivation of *Campylobacter jejuni* in Moisture Enhanced Non-intact Chicken Patties by Double Pan-broiling as Affected by Pump Rates and Cooking Temperatures. **2020 Annual Meeting of the International Association of Food Protection.** Oct. 26-28, Cleveland, Ohio (\*Graduate's work in my lab).
  9. Wentao Jiang, Ka Wang Li, Sumit K. Paudel, Nirosha Ruwani Amarasekara, Lisa Jones, Yifan Zhang, and **Cangliang Shen**. Survey of Locally Small Produce Growers' Perception of Antibiotic Resistance Issues at Farmers Markets. **2020 Annual Meeting of the International Association of Food Protection.** Oct. 26-28, Cleveland, Ohio (\*Graduate's work in my lab).
  10. Jeanna LaBarbara, Anna Loyd, KaWang Li, Wentao Jiang, and **Cangliang Shen**. Survival of *Listeria Monocytogenes* on McIntosh, Fuji, and Honeycrisp Apples Stored at 22°C. **2020 Annual Meeting of the International Association of Food Protection.** Oct. 26-28, Cleveland, Ohio (\*Undergraduate's work in my lab).
  11. Amrita Subramanya Swamy, Nirosha Ruwani Amarasekara, Sumit K. Paudel, **Cangliang Shen**, and Yifan Zhang. Isolation of *Salmonella* spp. and *Listeria monocytogenes* from Fresh Produce Sold at Farmers' Markets and Urban Gardens **2020 Annual Meeting of the International Association of Food Protection.** Oct. 26-28, Cleveland, Ohio.
  12. **Cangliang Shen**. Establish a sustainable food system to improve microbial safety of

- locally grown fresh produce-research and extension activities updates. **2020 Annual Meeting of the Institute of Food Technologists**. July 12-15, Chicago, IL.  
(Symposium Organizer and Presenter)
13. Yu-Chun Chiu, and **Cangliang Shen**. Impact of epicuticular wax on the attachment of *Salmonella* on leafy green surfaces during aerobic storage. **2020 Annual Meeting of the Institute of Food Technologists**. July 12-15, Chicago, IL.
  14. Jessica Lemley, Jacek Jaczynski, Michael Gutensohn, Kristen Matak, **Cangliang Shen**, De'Anthony Morris, Avery Fleearty. Bio-marker Volatile Organic Compounds (VOCs) for ultra-sensitive real-time pathogen detection in food using gas chromatography mass spectrometry (GC-MS). **2020 Annual Meeting of the Institute of Food Technologists**. July 12-15, Chicago, IL.
  15. **Cangliang Shen**. Research Updates of Applying Non-thermal Technology to Improve Microbial Safety and Quality of Food Products. **2019 Annual Meeting of the Institute of Food Technologists**. June 2-5, New Orleans, LA. (Symposium Organizer and Presenter)
  16. KaWang Li, Lisa Jones, Xiaoli Etienne, Hanna Khouryieh, and **Cangliang Shen**. Compare the Efficacy of Two Triple-Wash Procedures with Commercial Antimicrobials to Inactivate *Salmonella* and *Listeria monocytogenes* on Tomatoes, Cucumbers and Spinach and Related Economic Feasibility Analysis. **2019 Annual Meeting of the Institute of Food Technologists**. June 2-5, New Orleans, LA.  
(\*Graduate's work in my lab)
  17. KaWang Li, Lisa Jones, Wentao Jiang, Hanna Khouryieh, and **Cangliang Shen**. Validation of the Efficacy of Triple-Wash Procedures with Commercial Antimicrobials to Inactivate *Salmonella* and *Listeria Monocytogenes* and Improve Microbial Quality of Squashes-Laboratory and Plant Onsite Studies. **2019 Annual Meeting of the International Association of Food Protection**. July 21-24, Louisville, Kentucky  
(\*Graduate's work in my lab)
  18. Wentao Jiang, Lacey Lemonakis, KaWang Li, and **Cangliang Shen**. Thermal Inactivation of *Salmonella*, *Campylobacter Jejuni* and *Listeria Monocytogenes* in Moisture Enhanced Non-Intact Chicken Patties By Double Pan-Broiling Under Dynamic Conditions. **2019 Annual Meeting of the International Association of Food Protection**. July 21-24, Louisville, Kentucky (\*Graduate's work in my lab)
  19. **Cangliang Shen**, KaWang Li, Lacey Lemonakis, Wentao Jiang, Jeremy Adler, Xiaoli Etienne. Validation of Applying Immersion Versus Electrostatic- Sprayer with Commercial Antimicrobials Against Unstressed, Acid, Starvation, or Cold Stress Adapted *Campylobacter Jejuni* on Broiler Wings and Related Cost Effectiveness Analysis. **2019 Annual Meeting of the International Association of Food Protection**. July 21-24, Louisville, Kentucky (\*Graduate's work in my lab)
  20. Lacey Lemonakis\*, Wentao Jiang, KaWang Li, and **Cangliang Shen**. Evaluate the efficacy of applying a portable electrostatic sprayer with commercial antimicrobials against unstressed and starvation-stress-adapted *Campylobacter jejuni* on broiler

- wings. **2018 Poultry Science Association Annual Meeting**, July 23-26th, San Antonio, Texas (\*Graduate's work in my lab)
21. Wentao Jiang\*, KaWang Li, Lacey Lemonakis, and **Cangliang Shen**. Validation of applying electrostatic versus conventional sprayer with commercial antimicrobials to inactivate *Salmonella*, *Listeria monocytogenes* and *Campylobacter* on eggs. **2018 Poultry Science Association Annual Meeting**, July 23-26th, San Antonio, Texas (\*Graduate's work in my lab)
  22. KaWang Li\*, Lisa Jones, Hanna Khouryieh, and **Cangliang Shen**. Validation of Three-Step Wash Process with Commercial Antimicrobials to Control of *Salmonella* and *Listeria monocytogenes* on West Virginia Locally Grown Tomatoes, Cucumbers and Squashes. **2018 Annual Meeting of the International Association of Food Protection**. July 8-11 in Salt Lake City, Utah. (\*Graduate's work in my lab)
  23. KaWang Li\*, Hanna Khouryieh, Lacey Lemonakis, Lisa Jones and **Cangliang Shen**. Consumers' Perception of Food Safety of Perishable Foods Sold at Northern West Virginia and Western Pennsylvania Farmers Markets. **2018 Annual Meeting of the International Association of Food Protection**. July 8-11 in Salt Lake City, Utah. (\*Graduate's work in my lab)
  24. Lacey Lemonakis\*, KaWang Li, and **Cangliang Shen**. Evaluate the efficacy of commercial antimicrobials against unstressed, acid, starvation, or cold-stress-adapted-*Campylobacter jejuni* on broiler wings. **2018 Annual Meeting of the International Association of Food Protection**. July 8-11 in Salt Lake City, Utah. (\*Graduate's work in my lab)
  25. KaWang Li\*, and **Cangliang Shen**. Evaluate the Survival of *Salmonella* spp. and *Listeria monocytogenes* on pressed-card, plastic polyethethylene, and wood container surfaces during refrigerated and room temperature storage. **2018 Annual Meeting of the Institute of Food Technologists**. July 15-18, Chicago, IL. (\*Graduate's work in my lab, Finalist of Food Microbiology Division Competition)
  26. **Cangliang Shen**. Improving microbial safety of fresh produce - pilot plant and commercial scaled studies and related agricultural economic analysis. **2018 Annual Meeting of the Institute of Food Technologists**. July 15-18, Chicago, IL. **(Symposium Organizer and Presenter)**
  27. Yu-Chun Chiu, Ka-Wang Li, Moo Jung Kim, **Cangliang Shen** and Kang-Mo Ku. Difference in Attachment of *Salmonella enterica* to Waxy or Glossy Collard Leaves. **2017 American Society for Horticulture Science (ASHS) Annual Conference**. Sep 21<sup>st</sup>. Waikoloa, Hawaii.
  28. KaWang Li, Lacey Lemonakis, Brian Glover, and **Cangliang Shen**. *Salmonella* and *Campylobacter* prevalence in broiler ceca and on ready-to-cook carcasses processed at a pilot mobile poultry processing unit. **2017 Annual Meeting of the International Association of Food Protection**. July 9th-12th, Tampa, Florida. (\*Graduate's work in my lab, **Finalist of Developing Scientist Competition, Top 10 among >100 graduate students around the world**)

29. KaWang Li, Lacey Lemonakis, and **Cangliang Shen**. Survival of *Salmonella* and *Listeria monocytogenes* on pressed-card and plastic polyethethylene board from farmers' market and validate commercial sanitizers to decontaminate *Salmonella* and *Listeria monocytogenes*. **2017 Annual Meeting of the International Association of Food Protection**. July 9th-12th, Tampa, Florida. (\*Graduate's work in my lab)
30. Lacey Lemonakis, KaWang Li, and **Cangliang Shen**. Prevalence of *Salmonella* and *Campylobacter* spp. on broiler carcasses from a small USDA-inspected slaughter facility and validation of commercial antimicrobials against unstressed or cold-stress adapted *Salmonella* and *Enterococcus faecium* on broiler carcasses and wings. **2017 Annual Meeting of the Institute of Food Technologists**. June 25-28, Las Vegas, NV. (\*Graduate's work in my lab)
31. Lacey Lemonakis, KaWang Li, and **Cangliang Shen**. Validation of commercial antimicrobials against unstressed and cold-stressed *Campylobacter jejuni* cells on broiler carcasses and wings processed at a small USDA-inspected slaughter facility. **2017 Poultry Science Association Annual Meeting**, July 17-20th, Orlando, FL (\*Graduate's work in my lab)
32. **Cangliang Shen**. Developing Solutions for Poultry Safety Amidst Antibiotic Regulations Food Microbiology Symposium. **2017 Annual Meeting of the Institute of Food Technologists**. June 25-28, Las Vegas, NV. (\*Organizer and Presenter)  
**Presentation title** "Microbial Quality and Control Strategies of *Salmonella* and *Campylobacter* on Chicken carcasses and parts processed in Northwest West Virginia"
33. **Cangliang Shen**. Anti-listerial activity of hops beta acids on ready-to-eat meat products. **252nd American Chemical Society National Meeting**. August 21-25, 2016, Philadelphia, PA.
34. KaWang Li\*, Lacey Lemonakis, Brian Glover, Jordan Garry, Payton Southall, Joseph Moritz, **Cangliang Shen**. Microbiological quality assessment, *Salmonella* and *Campylobacter* prevalence in broiler ceca and ready-to-cook carcasses. **2016 Poultry Science Association Annual Meeting**, July 11th-14th, New Orleans, LA. (\*Graduate's work in my lab)
35. Lacey Lemonakis\*, KaWang Li, Jordan Garry, Payton Southall, **Cangliang Shen**. Validation of peroxyacetic acid, lactic acid, lactic and citric acid blend, and sodium hypochlorite against unstressed- and cold-stress-adapted salmonella on broiler carcasses and wings processed at a small USDA-inspected slaughter facility in West Virginia. **2016 Poultry Science Association Annual Meeting**, July 11<sup>th</sup>-14<sup>th</sup>, New Orleans, LA. (\*Graduate's work in my lab)
36. KaWang Li\*, Lacey Lemonakis, Jordan Garry, Jennifer Weidhaas, Hanna Khouryieh, Martin Stone, and **Cangliang Shen**. Microbiological Quality and Safety of Fresh Produce and an Assessment of Post-Harvest Practice of Venders at West Virginia and Kentucky Farmers' Markets. **2016 Annual Meeting of the International**

- Association of Food Protection**, July 31st-August 3rd, St. Louis, Missouri.  
(\*Graduate's work in my lab)
37. Lacey Lemonakis\*, KaWang Li, Jordan Garry, Payton Southall, Jennifer Weidhaas, Jeremy Adler, and **Cangliang Shen**. Microbiological Quality Assessment and Validation of Peroxyacetic acid, Lactic Acid, Lactic and Citric Acid Blend, and Sodium Hypochlorite against *Salmonella* on Broiler Carcasses and Wings Processed at A Small USDA-Inspected Slaughter Facility in West Virginia. **2016 Annual Meeting of the International Association of Food Protection**, July 31st-August 3rd, St. Louis, Missouri. (\*Graduate's work in my lab)
  38. **Cangliang Shen**. Improving Microbial Safety of Locally Grown Fresh Produce at Multi-States in U.S. through Research and Extension Approaches. **Food Microbiology Symposium 2016 Annual Meeting of the Institute of Food Technologists**. July 11-14, Chicago, IL. (\*Organizer and Presenter)
  39. **Cangliang Shen**, and Li Wang. Modeling the survival of unstressed, acid, cold, and starvation stress adapted *Listeria monocytogenes* in ham extract with hops beta acids (HBA) and sensory evaluation of HBA on ready-to-eat meat products. **2015 Annual Meeting of the International Association of Food Protection**, July 25-28th, Portland, Oregon
  40. KaWang Li\*, **Cangliang Shen**, and Pauline Norris. Generation of Chlorine By-products Haloacetic acid and Trihalomethanes in Simulated Produce Wash Water with High Organic Loads. **2015 Annual Meeting of the International Association of Food Protection**, July 25-28th, Portland, Oregon (\*Undergraduate and graduate's work in my lab)
  41. Jeremy Adler, Erin Cain-Helfrich, and **Cangliang Shen**. A Pilot Scale Evaluation of a Spray Cabinet with Commercial Antimicrobials against *Escherichia coli* O157:H7 Surrogate Survival on Jalapeno Peppers. **2015 Annual Meeting of the International Association of Food Protection**, July 25-28th, Portland, Oregon (Extension work)
  42. **Cangliang Shen\***. Decontamination and inactivation strategies to reduce pathogens in foods. **Food microbiology Symposium 2015 Annual Meeting of the Institute of Food Technologists**. July 11-14, Chicago, IL. (\*Organizer)
  43. KaWang Li\*, **Cangliang Shen**, and Amanda McKeith. Quality attributes and thermal inactivation of *Escherichia coli* O157:H7 in non-intact veal and beef patties by double pan-broiling. **2015 Annual Meeting of the Institute of Food Technologists**. July 11-14, Chicago, IL. (\*Undergraduate and graduate's work in my lab)  
**Before WVU**
  44. Zach Vincent, Hanna Houryieh, Martin Stone, **Cangliang Shen**, Todd William, and Jerry Daday. An Assessment of Food Safety Practices at Farmers Market in Kentucky. **2015 Annual Meeting of the Institute of Food Technologists**. July 11-14, Chicago, IL.
  45. Courtney Broyles\*, Ellen Vice\*, Russell McKeith, Amanda McKeith, and **Cangliang**



- Shen.** Thermal inactivation of *Escherichia coli* O157:H7 and Non-O157 Shiga toxin producing *E. coli* in moisture enhanced non-intact beefs as affected by internal temperature, moisture enhancing Rate, and resting time by double pan-broiling. **2014 Annual Meeting of the International Association of Food Protection**, August 3-6th, Indianapolis, Indiana. (\*Undergraduate's work in my lab, **First place of Undergraduate Poster Competition**)
46. Amanda McKeith, **Cangliang Shen**, Courtney Broyles\*, Ellen Vice\*, and Russell McKeith, Color of moisture enhanced non-intact beef steaks as affected by internal temperature and moisture enhancing rate by double pan-broiling. **2014 AMSA 67<sup>th</sup> Reciprocal Meat Conference (RMC)**, June 15-18, Madison, Wisconsin. (\*Undergraduate's work in my lab)
47. **Cangliang Shen**, Alyssa Huff\*, and Kelsey Carter\*. Survival of unstressed and acid stress adapted *Listeria monocytogenes* exposed to hops beta acids in ham extract stored at 7.2°C. **2014 Annual Meeting of the Institute of Food Technologists**. June 21-24, New Orleans, LA. (\*Undergraduate's work in my lab)
48. **Cangliang Shen**, Amanda McKeith, Kelsey Carter\*, Alyssa Huff\*, Courtney Broyles, and Russell McKeith. Investigate the efficacy of hops beta acids to inactivate unstressed or acid stress adapted *Listeria monocytogenes* on commercial cured ham during storage at 7.2°C. **2014 Annual Meeting of the Institute of Food Technologists**. June 21-24, New Orleans, LA. (\*Undergraduate' work in my lab)
49. **Cangliang Shen**. Evaluation of chlorine efficacy against *Escherichia coli* O157:H7 survival and cross-contamination during produce washing in consideration of wash-water quality. **2013 Annual Meeting of the Institute of Food Technologists**. July 13-16, Chicago, IL.
50. **Cangliang Shen**, Yaguang Luo, Xiangwu Nou, Gary Bauchan, Bin Zhou, Qin Wang, and Patricia Millner. Fresh produce washing aid, T-128, enhances inactivation of *Salmonella* and *Pseudomonas* biofilms on stainless steel coupons in chlorinated wash solutions. **2012 Annual Meeting of the International Association of Food Protection**, July 22-25, Providence, Rhode Island.
51. **Cangliang Shen**, Yaguang Luo, Xiangwu Nou, Qin Wang, and Patricia Millner. Enhanced inactivation of *Salmonella*, *Escherichia coli* O157:H7 and *Pseudomonas* biofilms using fresh produce washing aid, T-128, on cantaloupe rinds with chlorinated wash solutions. **2012 Annual Meeting of the International Association of Food Protection**, July 22-25, Providence, Rhode Island.
52. **Cangliang Shen**, Yaguang Luo, Xiangwu Nou, Qin Wang, and Patricia Millner. 2012. Inactivation of *Salmonella*, *Escherichia coli* O157:H7 and Non-O157 STEC by hypochlorite solutions with high organic loads. **2012 Annual Meeting of the International Association of Food Protection**, July 22-25, Providence, Rhode Island.
53. **Cangliang Shen**, Yaguang Luo, Xiangwu Nou, Gary Bauchan, Bin Zhou, Qin Wang, and Patricia Millner. 2012. Fresh produce washing aid, T-128, enhances inactivation

- of *Salmonella* and *Pseudomonas* biofilms on stainless steel and cantaloupe rinds in chlorinated wash solutions. **2012 American Phytopathological Society Human Pathogen on Plants Workshop**, February 13-15, Hyattsville, Maryland.
54. David Ingram, Bin Zhou, **Cangliang Shen**, Yang Yang, Manan Sharma, Xiangwu Nou, Patricia Millner, Yaguang Luo. 2012. Pre-Harvest to Post-harvest strategies for the reduction of human pathogens in tomatoes and leafy greens: a farm to fork systems approach. **2012 American Phytopathological Society Human Pathogen on Plants Workshop**, February 13-15, Hyattsville, Maryland.
55. **Cangliang Shen**, Ifigenia Geornaras, Keith E. Belk, Gary C. Smith and John N. Sofos, 2010. Thermal inactivation of acid, cold, heat, starvation and desiccation stress-adapted *Escherichia coli* O157:H7 in nonintact beef moisture-enhanced with various brine ingredients. **97<sup>th</sup> Annual Meeting of the International Association of Food Protection**, August 1-4, Anaheim, CA.
56. **Cangliang Shen**, Ifigenia Geornaras, Keith E. Belk, Gary C. Smith and John N. Sofos, 2010. Thermal inactivation of *Escherichia coli* O157:H7 in moisture-enhanced nonintact beef by pan-broiling or roasting using different cooking appliances with different starting temperatures. **70<sup>th</sup> Annual Meeting of the Institute of Food Technologists**. July 17-21, Chicago, IL.
57. **Cangliang Shen**, Keith E. Belk, Jeremy M. Adler, Ifigenia Geornaras, Dale R. Woerner, J. Daryl Tatum, Gary C. Smith and John N. Sofos, 2009. Enhancing beef tenderness: pre- and post-harvest practices and microbiological considerations. **American Animal Science Association and China Animal Science and Veterinary Medicine Association Pacific Rim Conference**, November 8-10, Beijing, China
58. **Cangliang Shen**, Jeremy M. Adler, Ifigenia Geornaras, Keith E. Belk, Gary C. Smith and John N. Sofos, 2009. Thermal inactivation of *Escherichia coli* O157:H7 in nonintact beef steaks of different thickness by different cooking methods and equipment. **96<sup>th</sup> Annual Meeting of the International Association of Food Protection**, July 12-15, Grapevine, TX.
59. **Cangliang Shen**, Ifigenia Geornaras, Patricia A. Kendall and John N. Sofos, 2009. Survival of *Listeria monocytogenes* on diced ham and turkey breast treated with salad dressings without or with prior microwave oven heating. **69<sup>th</sup> Annual Meeting of the Institute of Food Technologists**. June 6-10, Anaheim, CA.
60. **Cangliang Shen**, Ifigenia Geornaras, Patricia A. Kendall and John N. Sofos, 2008. Control of *listeria monocytogenes* on frankfurters by dipping in hops beta acids solutions. **95<sup>th</sup> Annual Meeting of the International Association of Food Protection**, August 3-6, Columbus, Ohio. Abstract No. P5-31.
61. **Cangliang Shen**, Ifigenia Geornaras, Patricia A. Kendall and John N. Sofos, 2008. Antilisterial activities of salad dressings, without or with prior microwave oven heating, on frankfurters during simulated home storage. **95<sup>th</sup> Annual Meeting of the International Association of Food Protection**, August 3-6, Columbus, Ohio.

Abstract No. P2-50.

62. **Cangliang Shen**, Ifigenia Geornaras, Patricia A. Kendall and John N. Sofos, 2008. Antilisterial activity of hops beta acids in broth with or without other antimicrobials. **68<sup>th</sup> Annual Meeting of the Institute of Food Technologists**. June 28 – July 2, New Orleans, LA. Abstract No. 052-20.
63. **Cangliang Shen**, Wen Yao, Weihua Chen, Weiyun Zhu, Sixiang Zou, 2005. Effect of conglycinin pepsin hydrolysates on intestinal bacterial community and health in mice after feeding *E. coli*. **2005 The International Symposium on Molecular Microbiology of the Gut**, July 10-12, Nanjing, China

#### **Local and Regional Conference Abstracts:**

1. KaWang Li\*, Amanda McKeith, and **Cangliang Shen**. Quality change and thermal inactivation of *Escherichia coli* O157:H7 in Non-intact beef or veal patties by double pan-broiling. **2014. Kentucky Honors Roundtable. September 28th, Bowling Green, KY.** (\*Undergraduate' work in my lab)
2. Courtney Broyles\* and **Cangliang Shen**. Thermal inactivation of *Escherichia coli* O157:H7 in moisture enhanced non-intact beefs as affected by internal temperature, moisture enhancing rate, and resting time by double pan-broiling. **2014. Western Kentucky University, 44<sup>th</sup> Student Research Conference (First place of honors' students' oral section)**
3. **Cangliang Shen**. Dynamic effects of free chlorine on the inactivation of *Escherichia coli* O157:H7 on leafy greens-laboratory and pilot plant study. **2013. American Society of Microbiology, KY-TN Branch Meeting. October 25-26, Bowling Green, KY.**
4. Kelsey Carter\*, Alyssa Huff, and **Cangliang Shen**. Control of unstressed and acid-stress adapted *Listeria monocytogenes* on commercial hams by hops beta acids during aerobic storage at 7°C. **2013. Kentucky Academy of Science, Microbiology Section.** November 8-9<sup>th</sup>, Morehead, KY. (\*Undergraduate' work in my lab, **third place** of oral competition)
5. Alyssa Huff\*, Kelsey Carter, and **Cangliang Shen**. Inactivation of unstressed or acid-stress adapted *Listeria monocytogenes* in ham extract by hops beta acids. **2013. Kentucky Academy of Science, Microbiology Section.** November 8-9<sup>th</sup>, Morehead, KY. (\*Undergraduate's work in my lab, **2<sup>nd</sup> place** poster competition)
6. **Cangliang Shen**. Comparison studies of a neutral anolyte solution from electrolyzed water to sodium hypochlorite on the inactivation of *Escherichia coli* O157:H7 during leafy green washing process. **2012 Kentucky Academic of Science Annual Conference.** October 19<sup>th</sup>-20<sup>th</sup>, Richmond, Eastern Kentucky University, KY.

#### **Extension Training Certifications:**

1. FSMA-Preventive Control for Human Food Training Certification, organized by Pennsylvania State University, April. 2019
2. HACCP training certification (HACCP workshop) at Pennsylvania State University, Feb. 2015

#### **Extension Publications:**

1. **Cangliang Shen.** 2021. Impact of spinach washing on the free chlorine concentration (virtual Demo). <https://www.youtube.com/watch?v=6S4QelR6xHY>
2. **Cangliang Shen.** 2021. Triple-Wash with SaniDate-5.0 (virtual Demo). <https://youtu.be/fENy5OO1ry0>.
3. **Cangliang Shen,** and Lisa Jone. 2021. Triple-Wash with SaniDate-5.0 to Kill Foodborne Pathogens on Spinaches. WVU Small Farm Conference Newspaper, February 2021 and WVU Extension Service Research Note <https://mailchi.mp/mail.wvu.edu/anr-research-notes-4760192?e=ce29cc14f7>.
4. **Cangliang Shen,** Xiaoli Etienne, and Lisa Jones. 2020. Triple-Wash with SaniDate to Improve Shelf-life of Butternut Squashes. WVU Small Farm Conference Newspaper, February 2020
5. **Cangliang Shen** and Lisa Jones. 2020. Applying Three-step Wash during Produce Processing (Version 2, WVU Extension Fact Sheet).
6. **Cangliang Shen** and Lisa Jones. 2019. Applying Three-step Wash during Produce Processing (Version 1, WVU Extension Research Notes). <https://us9.campaign-archive.com/?u=c8ef548894e23803ce5576625&id=bb9df44b85>.
7. Vincent Zach, Hanna Khouryieh, Martin Stone, **Cangliang Shen,** and Todd William. 2015. Good Agricultural Practices for Small Fresh Produce Farmers and Vendors. Extension Publication. Western Kentucky University, Bowling Green, KY. (updated in fall 2018)

#### **Extension Short Courses, Presentations, and Interview:**

1. Introduction of HACCP and Triple Wash. **Cangliang Shen.** 2020. **West Virginia Small Farm Conference.** Feb 21st, Charleston Civic Center, West Virginia.
2. Apply Three-Step Wash to Improve Microbial Safety of Squash. **Cangliang Shen.** 2019. **West Virginia Small Farm Conference.** Feb 14th, Charleston Civic Center, West Virginia.
3. Microbial profile of fresh produce and environmental samples from WVU organic produce farm. **Cangliang Shen** and Lewis Jett. 2018. **WVU Davis College of Agriculture, Natural Resources and Design and Extension Service Joint Research Symposium,** September 7, Bruceton Mills, West Virginia.
4. Apply Three-Step Wash to Improve Microbial Safety of Produce. **Cangliang Shen.** 2018. **West Virginia Small Farm Conference.** Feb 24th, Morgantown, West Virginia.

5. Food safety of WV locally grown food. **Cangliang Shen. 2017. West Virginia University Extension Annual Meeting.** Sep. 19th to 21st. Jackson Mills, West Virginia.
6. Post Harvest Handling. **Cangliang Shen. 2016. West Virginia Farmers Market Manager Training.** Mar 21st and 22nd, West Virginia State University, Charleston, West Virginia.
7. Foodborne Pathogen Controls during Mobile Poultry Processing. **Cangliang Shen. 2016. West Virginia Small Farm Conference.** Feb 25 to 27th, Charleston Civic Center, West Virginia.
8. Introduction of postharvest control strategies to control foodborne pathogens on fresh produce. **Cangliang Shen. 2015. West Virginia Southern Coalfield Food-shed Gathering.** Oct 19th, Welch, West Virginia.
9. Introduction of Good Agriculture Practices (GAP) for West Virginia Farmers Market Fresh Produce Vendors. **Cangliang Shen. 2015. West Virginia Urban Agriculture Conference.** Sep 18 to 20, Institute, West Virginia.
10. Participate “Poultry Production Workshop” at Marshall County Extension Office, Moundsville, WV, May 4th, 2015.
11. Post-harvest Sanitize and Water Quality. **Cangliang Shen. 2015. West Virginia Small Farm Conference.** Feb 26 to 28<sup>th</sup>, Charleston Civic Center, West Virginia.
12. **Phone interview** with Bain Rodney from **USDA Radio News** regarding **food safety after potential hurricane and flooding**, 1:30-1:45 pm, October 2<sup>nd</sup>, 2015  
<http://audioarchives.oc.usda.gov/node/248>.

### **Professional Services:**

#### **1. Grant Review Panel**

- 2017 USDA-NIFA Division of Community & Education Institute of Youth, Family, & Community, Pre- and Post- Graduate Fellowships. (15 submitted proposals)
- 2016 USDA-NIFA Division of Community & Education Institute of Youth, Family, & Community, Pre- and Post- Graduate Fellowships. (15 submitted proposals)
- 2015 USDA-NIFA Division of Community & Education Institute of Youth, Family, & Community, National Needs Fellowships. (10 submitted proposals)
- 2015 USDA-NIFA Division of Community & Education Institute of Youth, Family, & Community, Non-Land Grant Colleges of Agriculture (NLGCA) (12 submitted proposals)

#### **2. Davis College, West Virginia University, 2015.1-**

- Davis college grants office director search committee, 2021.11.
- Review panel of Davis College Enrichment Grants (13 proposals), 2021. 5.10-17.
- WVAFES and Research Office Advisory Board Member, 2021.2-
- Davis College Student Research and Creative Scholarship Committee, 2019.2-

Assist to organize 2021 Davis College Research Day Graduate Student Research Competition as virtual conference organizer and section moderators.

**3. Division of Animal & Nutritional Sciences, West Virginia University, 2015.1-**

- Division faculty P&T committee member (alternative), 2021.1-2021.8
- Division Graduate Seminar *ad hoc* committee, Spring, 2020
- Division Director Search Committee, 2018.10-2019.5
- Division faculty P&T committee member, 2018.9-2019.8
- Division faculty P&T committee member, 2016.9-2017.8

**4. Department of Biology, Western Kentucky University, 2012.8-2014.12**

- Member of undergraduate class curriculum committee
- Search committee for recruiting Bio 113 instructor

**5. Editorial board members**

- Journal of Food Protection 2019-
- Food Protection Trends 2014-
- Journal of Food Processing and Preservation 2014-
- Frontiers in Sustainable Food System 2017-

**6. Membership in Professional Organizations**

- Institute of Food Technologists (IFT)-Biotechnology Division, Leadership Team member, Chair-Elect, Chair, Past-Chair, 2021-2023
- Institute of Food Technologists (IFT)-Food Microbiology Division, **Secretary, Chair-Elect, Chair, Past-Chair**, 2016-2021
- Institute of Food Technologists (IFT) (2008-), professional member (2013-) 2013-2017 IFT-Food Microbiology Division, **Members-at-Large (MAL), Student Competition Co-Chair, Professional Awards Chair, Secretary.**
- American Meat Science Association (2014-2015)
- IFT Food Microbiology Division (2008-)
- IFT Muscle Foods Division (2008-)
- IFT Rocky Mountain Section (2008-2011)
- International Association for Food Protection (IAFP) (2008-)
- Poultry Science Association (2015-)

**7. Secretary (2012.11-2013.11) and Chair (2013.11-2014.11) of Microbiology Division of Kentucky Academy of Science, Chair of Microbiology Division of Kentucky Academy of Science**

**8. External Reviewer for following journals and conference abstracts:**

**Journals:** International Journal of Food Microbiology, Journal of Food Science, Letters in Applied Microbiology, Journal of Agricultural and Food Chemistry, Journal of the American Oil Chemists' Society, African Journal of Biotechnology, LWT-Food Science and Technology, African Journal of Microbiology Research, Journal of Kentucky Academy of Science, Food Protection Trends, Journal of Dairy Science, Food Control, Food Microbiology, Journal of Food Protection

**Conference abstracts:**

1. 2012-2021 Annual Meeting of the Institute of Food Technologists Food microbiology Division submitted abstracts (20-50).
2. 2013-2016 Annual Meeting of the Institute of Food Technologists Food microbiology Division Graduate Student Research Poster and Oral Competition abstracts (20).
3. 2013 Annual Meeting of International Association of Food Protection Developing Scientist Competition Poster abstracts (80).
4. 2014 Annual Meeting of the Institute of Food Technologists Food microbiology Division Section Proposals (10).

**9. Judge for students' oral or poster competitions:**

1. On-site judge, 2019 WVU Davis College Research and Creative Scholarship Conference, Master Poster Presentation (9).
2. On-site judge, 2015-16 WVU Davis College Research and Creative Scholarship Conference, PhD oral presentation (9).
3. On-site judge, 2013 Annual Meeting of International Association of Food Protection Developing Scientist Competition Oral Presentation (6).
4. On-site judge, 2013-2016 Annual Meeting of the Institute of Food Technologists, Food microbiology Division Graduate Student Research: Poster (6) and Oral (6) Presentation.
5. Judge, undergraduate and graduate student poster (5) and oral (2) presentation competition, 2012-2013 98<sup>th</sup> -99<sup>th</sup> Kentucky Academy of Science Annual Meeting, Eastern Kentucky University, Richmond, KY.
6. 2011 and 2012, Research Day, Department of Nutrition and Food Science, University of Maryland, College Park. At National Agricultural Library, USDA.