

RANDALL K. PHEBUS, Ph.D.

(Curriculum Vitae)

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EDUCATION

B.S. 1986 Animal Sciences, The University of Tennessee
M.S. 1988 Food Technology and Science, The University of Tennessee
Ph.D. 1992 Food Science and Technology, The University of Tennessee

PROFESSIONAL EXPERIENCE

1992-Present: Kansas State University, Department of Animal Sciences & Industry/Food Science Institute. Food Microbiologist. (1992-1998 Assistant Professor; 1998-2005 Associate Professor; 2005-present Professor).

Leads nationally renowned food safety and agricultural defense research program focused on control/elimination of public health pathogens from fresh and processed food products spanning the farm to table continuum. Research emphasizes development and validation of antimicrobial intervention technologies, environmental control of contamination, pathogen detection technology development, and process lethality determinations. Teaches or has taught "Introduction to Food Science", "Foodborne Pathogenic Microbiology", "Food Microbiology", "Rapid Methods and Automation in Microbiology", and ASI/FDSCI internship (distance learning) courses. Member of the Graduate Faculty in the Department of Animal Sciences and Industry, the Food Science Institute, the Department of Pathobiology, and the Master's in Public Health program. Advises undergraduate students in the Food Science and Industry degree program and undergraduate research projects. Principal investigator in the USDA Food Safety Consortium special congressional grant (1992-2011) and the USDA-NIFA Coordinated Agricultural Program (Controlling Shiga toxin-producing *E. coli* in the beef system) meat/beef safety research grants (2011-2017). Active in the International Association for Food Protection, serving on the annual meeting program committee (2006-2011; program chair for 100th anniversary annual conference. Currently, appointed by the U.S. Secretary of Agriculture to the National Advisory Committee for Meat and Poultry Inspection, and serves on the Committee on Agricultural and Food Microbiology of the Public and Scientific Affairs Board of the American Society for Microbiology.

2000-2003: Vice President and Chief Technology Officer. STERIS FoodLabs, Manhattan, KS.

Managed business development and technical services of commercial food analytical company. Coordinated contract research projects in food safety, quality, and process development. Consulted extensively with food industry clients on food safety and quality programs, troubleshooting, and regulatory compliance. Developed and ensured compliance with quality assurance programs for the commercial analytical laboratory component of the business.

1997-2000: Vice President and Chief Technology Officer. FoodLabs, Inc., Manhattan, KS.

Initiated company start-up and managed business development and technical services of commercial food analytical company. Coordinated contract research projects in food safety, quality, and process development. Consulted extensively with food industry clients on food safety and quality programs, troubleshooting, and regulatory compliance. Developed and ensured compliance with quality assurance programs for the commercial analytical laboratory component of the business.

1987-1992: Graduate Research and Teaching Assistant. Department of Food Technology and Science, The University of Tennessee, Knoxville, TN.

Instructed or assisted in numerous food science courses, with major responsibility for coordinating associated laboratory exercises. Courses included Food Microbiology, Advanced Food Microbiology, Food Processing, Food Chemistry, and Fats and Oils. Conducted food safety research focused on controlling foodborne pathogens in processed meat and poultry products, and on the utilization of natural enzymatic processes to remove aflatoxins from food commodities.

May 1990-Aug. 1990: Summer Graduate Intern. M&M Mars, Inc., Hackettstown, NJ.

Performed microbiological research and development activities related to shelf-life extension of refrigerated snack products. Conducted routine analytical testing of company products to ensure safety and quality.

1989-1991: Manager. Everett's Dairy Farm, Maryville, TN.

Managed daily production activities including milking operations, animal health, herd records, feeding, calf programs, and employees.

RESEARCH ACTIVITIES

Ph.D. Dissertation: Determination of the mode of action of *Flavobacterium aurantiacum* in biodegradation of aflatoxins (University of Tennessee, 1992).

M.S. Thesis: The effects of modified atmosphere packaging on the survival of *Campylobacter jejuni* in processed turkey rolls (University of Tennessee, 1988).

K-State Research Program: Microbiological Quality & Safety of Foods; Agricultural Biosecurity

- Control of *Salmonella* in dry extruded pet foods through process validations, utilization of antimicrobial food grade ingredients, and environmental control strategies.
- Control of mold and other spoilage agents in bakery products through process and environmental controls and product formulations.
- Determination of public health risks of various consumer preparation and cooking actions of convenience food products through consumer observational studies followed by inoculated laboratory validation studies.
- Evaluation of hard surface disinfection technologies to control pathogens in food processing operations.
- Evaluation and development of antimicrobial intervention strategies to reduce microbial populations on meat carcasses, fresh beef products, and processed meats.
- Process validation of dry and/or fermented meat products to assure pathogen lethality.
- Development and validation of post-process pasteurization methods and secondary microbial barriers for control of *Listeria monocytogenes* and *Clostridium* spp. in ready-to-eat processed meat products.
- Risk assessments to establish the safety of non-intact meat products manufactured using mechanical tenderization, pumping, and restructuring technologies.
- Development of rapid microbial detection and identification techniques for use in food and environmental monitoring.
- Large-scale food processing evaluations for food pathogens and select agent distribution for military food defense.
- Validation of military field diagnostic systems for various target biological agents (anthrax, botulinum toxin, *Brucella*, staphylococcal enterotoxin, ricin, *Francisella tularensis*, *Yersinia pestis*) to ensure food safety for our troops.
- Control of gaseous spoilage of fresh vacuum-packaged beef subprimals during chilled storage.
- Validation of baking and frying operations to control *Salmonella* and STEC pathogens in a multitude of bakery products to support commercial compliance with the Food Safety Modernization Act requirements.
- Estimation of the role of wheat milling in raw flour contamination and development/validation of commercially applicable intervention strategies to eliminate retail flour contamination.

Selected Recent Research Funding:

- U.S. Department of Defense Natick Soldier Systems Center. 2005-2010. Approximately \$10 million to support detection system validations for select agents in varied food matrices and determine distribution patterns and impact on detection of agents in commercial-simulated food processing scenarios.
- U.S. Department of Agriculture NIFA Coordinated Agricultural Programs (CAP) grant. 2011-2017. \$25 million over 5 years (1 year no-cost extension granted). Shiga-toxigenic *Escherichia coli* (STEC) in the beef chain: assessing and mitigating the risk by translational science, education and outreach. Phebus

serves as overall co-project director, lead for antimicrobial intervention group, liaison to the Stakeholder Advisory Board, and Kansas State University's lead PI. Phebus research budget is \$1.6 million over 5 years.

- AIB International (Manhattan, KS) contribution to the K-State Foundation in support of unrestricted research by Dr. Phebus on bakery products to support industry-based food safety programs. 2015-present. \$100,000 contributed to date.
- Kansas Biosciences Authority (via Corbion-Purac; Lenexa, KS). 2016-2017. Evaluation of proprietary natural antimicrobials to control pathogens in fresh poultry parts. \$50,000.
- FDA Strategy for Successful Implementation of FSMA in the North Central Region through Adoption of a Systems Approach and Stakeholder Engagement Framework. 2016-2019. Iowa State University is lead institution. Faculty involved are L Nwadike, F. Aramouni, M. Bates, S. Gragg, E. Pliakoni, R. Phebus, and C. Rivard. K-State subaward is \$24,000.
- U.S. Department of Agriculture, Food and Nutrition Services. 2013-2017. Center of Excellence for Food Safety Research in Child Nutrition Programs. Principle investigators are K. Roberts, K. Sauer, J. Sneed, S. Gragg and R. Phebus. Budget is \$1,600,000.
- Dairy Research Institute. 2015-2016. Use of nano-scale aqueous ozone to remove biofilms from selected dairy product contact surfaces. Principle investigators are J. Amamcharla, R. Phebus, K. Schmidt and S. Gragg. Budget is \$136,200.
- K-State Global Campus. Creation of advanced food safety courses with supplementary E-books. Co-PI's R. Phebus and S. Gragg. 2015-2017. Budget is \$20,499.

HONORS AND ACTIVITIES

- Marty Vanier and Bob Krause Biosecurity Research Institute Fellow designation (2016)
- Appointed by the U.S. Secretary of Agriculture to the National Advisory Committee for Meat and Poultry Inspection (2015-2017); re-appointed (2017-2019)
- Serves on the Committee on Agricultural and Food Microbiology of the Public and Scientific Affairs Board of the American Society for Microbiology (2015-present)
- Professorial Performance Award (2014); presented by the Provost, Kansas State University (awards strong performance at the highest professorship rank)
- Elmer Marth Educator Award from the International Association for Food Protection (2013)
- Outstanding Agriculture Faculty for Spring 2010 semester; Kansas State University College of Agriculture
- Associate Center Director for Education and Outreach, National Alliance for Food Safety & Security (2007-09)
- Phi Tau Sigma Honorary Society Outstanding Food Scientist Award (Kansas Chapter) (2005)
- Recipient of The National Committee for Employer Support of the Guard and Reserve Patriotic Employer Recognition (2004)
- Editorial Board of Journal of Rapid Methods and Automation in Microbiology (1996-2003)
- Editorial Board of Journal of Food Protection (1996-1999)
- Editorial Board of Letters in Applied Microbiology (1995-1997)
- Chancellor's Citation for Professional Promise in Agricultural Sciences & Natural Resources, University of Tennessee, Knoxville (1992)
- IFT Scholarship Jury Certificate of Merit (1989-1990)
- Gamma Sigma Delta Early Career Award of Merit (1998)
- Phi Tau Sigma Food Science Honorary; Secretary/Treasurer KSU chapter (1994); Vice President (1995); President (1996), Advisor (1997)
- American Society for Microbiology member
- Who's Who in Science and Engineering (1995)
- USDA National Research Initiative Competitive Grants Program peer reviewer (1995-1996)
- International Division of IFT Research Paper Competition; judging committee (1994) and competition chair (1995-1996)
- KSU Department of Animal Sci. & Ind. faculty coordinator for Ag Open House (1994-1995)

- IFT Student Association/Phi Tau Sigma/Proctor & Gamble Graduate Research Competition; judging committee (1994)
- Assistant Director KSU Rapid Methods & Automation in Microbiology Workshop (1993-2005)
- IFT Graduate Fellowships Jury (1997-98)
- National HACCP Alliance committee for development of generic beef slaughter HACCP plan, Kansas City, MO (1996)

- ***The International Association for Food Protection (member since 1988):***
 - IAMFES Developing Scientist Award Competition winner (1993)
 - IAMFES Developing Scientist Competition award committee (1995-1996, 2009-2010)
 - IAFP 2004 Program Committee assignment “Application of Secondary Inhibitors in Ready-to-Eat Meat and Poultry Processing: Food Safety, Quality and Regulatory Implications”
 - Journal of Food Protection Management Committee (2002-2005)
 - International Food Safety Icons II Development Committee (led by Kraft Foods and Walt Disney World) (2004-present)
 - International Association for Food Protection Educator Award Committee (2004-2006; chair 2006)
 - Grocery Manufacturers Association Food Safety Selection Committee (2005-2006)
 - IAFP Program Committee for annual international symposia (2006-2009); Vice Chair 2010, Chair 2011
 - IAFP Nominating Committee (2010-11; 2016-17)
 - IAFP Food Protection Trends (peer-reviewed journal) Management Committee (2013-2017)
 - IAFP Foundation Committee (2015-2018)
 - IAFP Black Pearl Award review and selection committee (2017)
 - Member of IAFP’s Professional Development Groups: Pre-Harvest Food Safety, Food Defense, International Food Protection Issues, Meat and Poultry Safety and Quality, Applied Laboratory Methods, Food Hygiene and Sanitation, Microbial Modeling and Risk Assessment, and Food Safety Network

- ***Kansas State University Food Science Institute:***
 - Food Science Outstanding Undergraduate Senior Selection Committee (award founder and chair, 2017)
 - Food Science Outstanding Graduate Student Award (award founder, 2017)
 - Food Science Program Assessment Committee (2016-present)
 - Dean’s Committee to Evaluate the Structure and Needs of the Food Science Program into the Future (2016)
 - KSU Food Science Club Advisor (1993-1997)
 - KSU Food Science Graduate Faculty Coordinating Committee (1994-1999); 2009-2011
 - Faculty leader for core (Call Hall) Food Science Faculty Group (2003-2004)
 - Industry Relations Committee member (2002-Present)
 - Student Recruitment Committee (2003-Present)
 - Graduate Program Coordinating Committee member (2003-2005)
 - Graduate Student Applications Committee member (2002)
 - K-State Provost’s Targeted Excellence in Food Safety & Security Program; Principle Investigator (2004)
 - Assistant Director – International Rapid Methods and Automation in Microbiology Workshop (1994-2006)
 - Lead Investigator – USDA Food Safety Consortium (1992-2011)
 - Lead Investigator – National Alliance for Food Safety & Security (1998-2008)
 - Lead Investigator – Hatch Projects
 - ◆ Meat Quality and Safety (2006)
 - ◆ Post-Harvest Food Safety (2007)
 - ◆ Production Food Safety and Security (2007-present)

- **Kansas State University National Agricultural Biosecurity Center:**
 - Lead program investigator (2003-2005) and PI on grant establishing center (ca. \$2.5M) to evaluate mass carcass disposal technologies, foreign disease agent entry pathways in agriculture, and emergency response preparedness in agriculture
 - NABC Forum and Website committee (2002)
 - Kansas State University Food Safety & Security BL3 Complex, architectural review committee (2002-2005)
 - Food Safety and Defense (FSDL) research laboratory - Director; development of laboratory SOPs and quality systems; biosafety systems coordinator, graduate and undergraduate student research mentor (1992-Present)
 - International Agricultural Biosecurity Symposium initiation and development committee (2004-2007)
 - Auburn University Post-Harvest Food Protection Consortium; Task C: Early Event Detection & Response working group (www.postharvestcenter.eng.auburn.edu) (2004-2006)
 - Kansas State University Research and Extension Emergency Preparedness Committee (2003-2004)
 - Principal Investigator on DOD U.S. Army Natick Soldier Center threat agent detection in foods grant (ca. \$4.8M, FY 2005-07 and \$5.81 M 2007-2010; 2011 funding secured at ~\$1.4 M)

THESES AND DISSERTATIONS: MAJOR ADVISOR

Vega, D. Validation studies for control of foodborne pathogens in raw and processed meat and poultry. (Ph.D. dissertation in progress)

Sevart, N. Validation of electrostatic spray application of food-grade antimicrobials to reduce the risk of Shiga toxin-producing *Escherichia coli* in beef trimmings and on carcasses. (Ph.D. dissertation in progress)

Kumar, S. Development and validation of antimicrobial products and technologies for meat and poultry processing to control foodborne pathogens and improve shelf life utilizing Corbion Purac (Lenexa, KS) intellectual property. (Ph.D. dissertation in progress)

Acuff, J. 2017 Validation of various carcass intervention and beef processing strategies to control Shiga toxin-producing *Escherichia coli*. M.S. thesis.

Krug, M. 2017. Evaluating the efficacy of commonly used antimicrobials in the beef industry for controlling Shiga toxin-producing *Escherichia coli* contamination on chilled beef subprimals and pre-rigor carcass sides. M.S. thesis.

Wilder, A. 2016. Evaluation of a novel commercial ground beef production system using a chlorinated nanobubble antimicrobial technology to control Shiga toxin-producing *Escherichia coli* and *Salmonella* spp. surrogates. M.S. thesis.

Holmgren, E.S. 2015. Validation of baking to control *Salmonella* serovars in hamburger bun manufacturing, and evaluation of *Enterococcus faecium* ATCC 8459 and *Saccharomyces cerevisiae* as nonpathogenic surrogates for thermal process validation. M.S. thesis.

Schwan, C.L. 2015. Characterizing differences in Shiga toxin-producing *Escherichia coli* (STEC) attachment to pre-rigor and chilled beef carcass surfaces. M.S. thesis.

Baumann, N. 2014. Determination of optimal selective enrichment media and conditions to promote the survival and detection of Shiga toxigenic *Escherichia coli* from beef-associated samples. M.S. thesis.

Milke, D. 2014. Characterization of the growth/survival of *Francisella tularensis* in selected food matrices. M.S. thesis.

Michael, M. 2014. Radio frequency dielectric heating and hyperspectral imaging of common foodborne pathogens. Ph.D. dissertation.

Smith, J. 2013. *Campylobacter*, chicken, and the regulatory performance standard. M.S. report.

DeDonder, S. 2011. Video observations of consumer preparation practices for raw, frozen, breaded poultry products and determination of relative risk levels for *Salmonella*. Ph.D. dissertation.

Tanus, C.A. 2006. Antimicrobial effects of high pressure carbon dioxide, photoionization, and ozone on the safety and quality of fresh beef trimmings. Ph.D. dissertation (completed by Dr. Kastner while Phebus on leave).

- Forgey, R.** 2006. Development and commercial evaluation of the Grovac™ antimicrobial process for decontaminating retail beef trimmings prior to ground beef manufacturing. M.S. thesis (completed by Dr. Herald while Phebus on leave).
- Gill, V.** 2004. Evaluation of Pathatrix immunocapture technology in combination with PCR detection for *E. coli* O157:H7. M.S. thesis.
- Kethireddy, V.** 2004. Evaluation of the efficacy of impregnating a bacteriostatic chemical compound (Ional™) into sausage casings as a means for controlling outgrowth of *Listeria monocytogenes* during extended storage. M.S. thesis.
- Gill, V.S.** 2004. Effect of chemical rinses in combination with post-processing pasteurization on quality attributes and *Listeria monocytogenes* reductions in vacuum-packaged, ready-to-eat meat and poultry products. Ph.D. dissertation.
- Hickey, G.** 2003. Cleaning and sanitation of personnel protective equipment and evaluation of exterior sanitary garments for meat plant employees. M.S. thesis.
- Stoltenberg, S.K.** 2004. Validation of a direct acidification process to control *Escherichia coli* O157:H7 in beef and venison snack sticks. M.S. thesis.
- Villicana, M.T.O.** 2003. *Escherichia coli* O157:H7 and *Salmonella* spp. risk assessments for the production and cooking of restructured beef steaks. Ph.D. dissertation.
- Gosch, J.F.** 2003. *Salmonella* spp. and *Listeria monocytogenes* risk assessments for production and cooking of blade tenderized beef steaks. M.S. thesis.
- Coger, R.R.** 2003. Antimicrobial efficacy of colloidal silver on fresh beef tissue against *Salmonella* spp. and *Escherichia coli* O157:H7. M.S. thesis.
- Retzlaff, D.D.** 2002. Validation of static chamber steam pasteurization systems for decontaminating beef carcasses; and development of food safety educational materials for delivery through mediated formats. Ph.D. dissertation.
- Touvet, G.** 2003. Validation of pathogen reduction on beef trimmings and subsequent shelf-life effects in retail packaged ground beef using the Grovac™ decontamination process. M.S. thesis.
- Bieker, J.M.** 2002. Efficacy of Sandia National Laboratories DF-100 foaming sanitizer against planktonic and biofilm bacteria on various food contact surfaces. M.S. thesis.
- Singh, M.** 2002. Antimicrobial activity of cetyl pyridinium chloride against *Listeria monocytogenes* in ready-to-eat meats. M.S. thesis.
- Kerr, K.D.** 2001. Evaluation of activated lactoferrin to eliminate *Escherichia coli* O157:H7 from pre-rigor and post-rigor beef surface tissue. M.S. thesis.
- Rueger, S.A.** 2002. Survival of *Escherichia coli* and *Salmonella choleraesuis* in cellulose sponges for meat carcass hygiene monitoring. M.S. thesis.
- Bohra, L.K.** 2000. Evaluation of 5' nuclease based assays for the detection of *Escherichia coli* O157:H7 and *Salmonella typhimurium* from food, cattle feces and enrichment broth systems. Ph.D. dissertation.
- Chandler, C.B.** 2000. Process validation of commercial batter-formed beef jerky to reduce or eliminate high levels of *Salmonella* spp., *Listeria monocytogenes*, and *Escherichia coli* O157:H7. M.S. thesis.
- Moody, S.M.** 2000. Chow Time: Military Feeding from Bunker Hill to Bosnia. The history of the development and utilization of military rations in the United States Armed Forces. M.S. report.
- Schafer, M.D.** 2000. Microbial effectiveness of HACCP in small and very small red meat facilities. M.S. thesis.
- Dreibelbis, S.** 1999. Evaluation of five ATP bioluminescence hygiene monitoring systems in a commercial food processing facility. M.S. thesis.
- Sporing, S.B.** 1999. *Escherichia coli* O157:H7 risk assessment for production and cooking of blade tenderized beef steaks. M.S. thesis.
- Nutsch, A.L.** 1998. Bacterial decontamination of meat surfaces through the application of a steam pasteurization process. Ph.D. dissertation.
- White, P.E.** 1998. Microbiological and chemical characterization of commercial chub-packed ground beef: spoilage and shelf-life investigations. M.S. thesis.
- Goldsmith, J.A.** 1998. Intervention technologies to reduce pathogens in meat and other food products. M.S. report.

Culver, D. 1997. Evaluation of an undefined microbial competitive exclusion culture for its ability to prevent colonization of newborn calves by *Escherichia coli* O157:H7. M.S. thesis.

Barnes, M. 1997. Comprehensive literature survey of microbiological sampling methodologies for meat products and carcasses. M.S. report.

Brown, T.L. 1997. Evaluation of changes in microbial populations on beef carcasses resulting from steam pasteurization. M.S. thesis.

Liu, X. 1996. Developing methodology to support growth of *Arcobacter* spp. and recovery from meat products. M.S. thesis.

Bohra, L.K. 1996. Biodegradation of aflatoxins by *Flavobacterium aurantiacum* in culture media and corn. M.S. thesis.

PATENTS

Phebus, R.K., E.W. Krieger, J.L. Marsden, W.J.T. Biebesheimer, and D.D. Danforth. 2005. System for handling processed meat and poultry products. US Patent No. 6,964,788 B2.

CONGRESSIONAL / PUBLIC POLICY TECHNICAL SUBMISSIONS

Phebus, R.K. 2012. Consideration of safe handling / cooking labels for raw non-intact beef subprimals marketed in Canada: Expert testimony on foodborne pathogen risks and necessary cooking protocols to ensure beef safety. October 17 hearing with Health Canada officials.

Phebus, R.K., G. Huber and E. Richter. 2009. Proposal to promote a *Quality by Design* scientific approach to commercial pet food manufacturing to control pathogenic adulteration of finished products. Food and Drug Administration-Center for Veterinary Medicine staff training. Gaithersburg, MD. February 9, 2009.

Phebus, R.K., J.L. Marsden, H. Thippareddi, and S. Sporing. 2002. *Escherichia coli* O157:H7 risk assessment for production and cooking of blade tenderized beef steaks. KSU thesis (Sporing) reviewed at the National Advisory Committee on Microbiological Criteria for Foods, Sub-Committee Meeting on Non-Intact Meat Safety. Washington, DC. January 22-25.

Marsden, J.L. and R.K. Phebus. 2002. Control of *Listeria* in ready-to-eat meats using the Townsend steam-based pasteurization system combined with a secondary bacteriostatic treatment. Presented to the USDA-FSIS *Listeria* Working Group. Washington, DC. November.

Phebus, R.K., H. Thippareddi, J.L. Marsden, S. Sporing, J.B. Gosch, J. Wendelberg, and T. Ortega. 2001. Evaluation of pathogen risks associated with blade tenderized beef cooked to varying degrees of doneness. Presented at the Kansas Department of Health and Environment, Secretary's Food Safety Advisory Committee Meeting. Topeka, KS. December 11-12. *Collaborators: USDA Mid-West Advanced Food Manufacturing Alliance, USDA Food Safety Consortium, Cargill, Kansas Beef Council, Ross Industries, Hickory Specialties, and FNA Corporation.*

Phebus, R.K., J.L. Marsden, H. Thippareddi, S. Sporing, J.B. Gosch, and J. Wendelberg. 2001. Evaluation of pathogen risks associated with blade tenderized beef cooked to varying degrees of doneness. Presented at the National Advisory Committee on Microbiological Criteria for Foods, Sub-Committee Meeting on Non-Intact Meat Safety. Washington, DC. August 3. *Collaborators: USDA Mid-West Advanced Food Manufacturing Alliance, USDA Food Safety Consortium, Cargill, Kansas Beef Council, Ross Industries, Hickory Specialties, and FNA Corporation.*

Wendelberg, J., J.L. Marsden, R.K. Phebus, H. Thippareddi, and C.L. Kastner. 2001. *Salmonella* spp. risk assessment for production and cooking of blade tenderized prime rib. Research update submitted to the United States Department of Agriculture-Food Safety and Inspection Service. Washington, DC. July 18.

Marsden, J.L., R.K. Phebus, H. Thippareddi, C.L. Kastner, J.B. Gosch. 2001. *Salmonella* spp. and *Listeria monocytogenes* risk assessment for production and cooking of blade tenderized beef steaks. Research update submitted to the United States Department of Agriculture-Food Safety and Inspection Service. Washington, DC. July 18. *Collaborators: Kansas State University, Kansas Beef Council, Ross Industries, Food Safety Consortium, National Cattlemen's Beef Association.*

Phebus, R.K., J.L. Marsden, H. Thippareddi, S. Sporing, and T. Ortega. 2000. *Escherichia coli* O157:H7 risk assessment for production and cooking of blade tenderized beef steaks. Presented at the USDA-FSIS Public Meeting on *E. coli* O157:H7 Policy. Arlington, VA. February 29. *Collaborators: Kansas State University, Kansas Beef Council,*

Cargill, Ross Industries, Food Safety Consortium, National Cattlemen's Beef Association.

Phebus, R.K., J.L. Marsden, and A. Rasor. 2000. Policy change recommendation for the national FDA Food Code. Issue Number 00-03-21. Issue title: Destruction of Organisms in Blade Tenderized Steaks. Recommendation: Change FDA Food Code 1999, Section 3-401.11 (D)(2). Delegate action: Accepted. *Collaboration with North American Meat Processors Association.*

Phebus, R.K., J.L. Marsden, H. Thippareddi, and S. Spring. 1999. *Escherichia coli* O157:H7 risk assessment for production and cooking of blade tenderized beef steaks. Presented at the USDA-FSIS Public Meeting on *E. coli* O157:H7 Policy. Washington, DC. March 8. *Collaborators: Kansas State University, Kansas Beef Council, Cargill, Ross Industries, Food Safety Consortium, National Cattlemen's Beef Association.*

Wefald, J., M. Vanier, J.L. Marsden, R.K. Phebus, C.L. Kastner, R. Zeigler, R. Trewyn. 1999. Characterization of the asymmetry of the biological weapons threat to America's food and fiber industry. Testimony given before the U.S. Senate, Emerging Threats Subcommittee of the Committee on Agriculture. Washington, DC.

Phebus, R.K., J.L. Marsden, N. Kotrola, and A.L. Nutsch. 1997. Laboratory evaluation of the USDA-FSIS sponge sampling method for meat animal carcasses demonstrates severe lack of generic *E. coli* recoverability. Presented at the USDA-FSIS Review of *E. coli* Testing Technical Conference. Arlington, VA. May 8.

REFEREED PUBLICATIONS

Channaiah, L.H., M. Michael, J.C. Acuff, R.K. Phebus, H. Thippareddi, and G. Milliken. 2017. Evaluation of thermal inactivation parameters of *Salmonella* in whole wheat multigrain bread. *J. Food Sci.* (submitted)

Stella, J. M., J. B. Luchansky, K. Miller, B. A. Shoyer, L. E. Shane, L. McGeary, M. Osoria, L. Stahler, N. J. Severt, R. K. Phebus, H. Thippareddi, and A. C. S. Porto-Fett. 2017. Use of an electrostatic spraying system (ESS) or the sprayed lethality in container (SLIC) method to deliver antimicrobials onto the surface of beef subprimals to control Shiga toxin-producing cells of *Escherichia coli*. *J. Food Prot.* (accepted)

Channaiah, L.H., M. Michael, J.C. Acuff, R.K. Phebus, H. Thippareddi, M. Olewnik, and G. Milliken. 2017. Validation of the baking process as a kill-step for controlling *Salmonella* in muffins. *International J. Food Microbiol.* 250:1-6.

Couton, J., D. Marx, J.B. Luchansky, R.K. Phebus, A.C. Porto Fett, N. Severt, M. Singh, and H. Thippareddi. 2017. Shiga toxin-producing *Escherichia coli* in meat: a preliminary simulation study on detection capabilities for three sampling methods. *Applied Statistics In Agriculture Conference Proceedings*. PP.90-100. In *Proceedings of the 27th Conference on Applied Statistics in Agriculture*. Manhattan, KS; Kansas State University, Department of Statistics.

Channaiah, L.H., E.S. Holmgren, M. Michael, N.J. Severt, D. Milke, C.L. Schwan, M. Krug, A. Wilder, R.K. Phebus, H. Thippareddi, and G. Milliken. 2016. Validation of baking to control *Salmonella* Serovars in hamburger bun manufacturing, and evaluation of *Enterococcus faecium* ATCC 8459 and *Saccharomyces cerevisiae* as nonpathogenic surrogate indicators. *J. Food Prot.* 79:544-552.

Severt, N.J., N. Baumann, H. Thippareddi, T.A. Houser, J.B. Luchansky, A.C.S. Porto-Fett, D.B. Marx, G.R. Acuff, and R.K. Phebus. 2016. Evaluating the efficacy of three USDA-approved antimicrobial sprays for reducing Shiga toxin-producing *Escherichia coli* (STEC) surrogate populations on bob veal carcasses. *J. Food Prot.* 79:956-962.

Shane, L., A.C.S. Porto-Fett, B.A. Shoyer, R.K. Phebus, H. Thippareddi, A. Hollowell, K. Miller, L. Foster-Bey, S.G. Campano, P.J. Taormina, D.L. Glowinski, R.B. Tompkin, and J. B. Luchansky. 2015. Effect of fermentation and cooking times and temperatures for controlling Shiga toxin-producing *Escherichia coli* in a dry-fermented-type sausage. *Meat Sci.* 101:151-152.

Stromberg, Z.R., N. Baumann, G.L. Lewis, N.J. Severt, N. Cernicchiaro, D.G. Renter, D.B. Marx, R.K. Phebus, and R.A. Moxley. 2015. Prevalence of enterohemorrhagic *Escherichia coli* O26, O45, O103, O111, O121, O145, and O157 on hides and carcass surfaces of beef feedlot cattle at harvest. *Foodborne Pathogens and Disease* 12(7):631-638.

- Michael, M., R.K. Phebus, and K.A. Schmidt.** 2015. Plant extract enhances the viability of *Lactobacillus delbrueckii* subsp. *bulgaricus* and *Lactobacillus acidophilus* in probiotic nonfat yogurt. *Food Science & Nutrition* 3(1):48-55.
- Sneed, J., R. Phebus, D. Duncan-Goldschmidt, D. Milke, K. Sauer, K.R. Roberts, and D. Johnson.** 2015. Consumer food handling practices lead to cross-contamination. *Food Protection Trends* 35(1):38-48.
- Michael, M., R.K. Phebus, H. Thippareddi, J. Subbiah, S.L. Birla, and K.A. Schmidt.** 2014. Validation of radio-frequency dielectric heating system for destruction of *Cronobacter sakazakii* and *Salmonella* species in dry milk. *J. Dairy Sci.* 97(12):7316-7324.
- Chen, C., M. Michael, R.K. Phebus, H. Thippareddi, J. Subbiah, S.L. Birla, and K.A. Schmidt.** 2013. Short communication: Radio frequency dielectric heating of nonfat dry milk affects solubility and whey protein nitrogen index. *J. Dairy Sci.* 96:1471-1476.
- Consortium of Food Process Validation Experts.** 2013. Validation of antimicrobial interventions for small and very small processors: a how-to guide to develop and conduct validations. *Food Protection Trends* 33(2):95-104.
- Michael, M., R. K. Phebus, and K.A. Schmidt.** 2010. Impact of a plant extract on the viability of *Lactobacillus delbrueckii* ssp. *bulgaricus* and *Streptococcus thermophilus* in nonfat yogurt. *International Dairy Journal* 20:665-672.
- Luchansky, J.B., A.C.S. Porto-Fett, Bradley Shoyer, R. K. Phebus, H. Thippareddi, and Jeffrey E. Call.** 2009. Thermal inactivation of *Escherichia coli* O157:H7 in blade tenderized beef steaks cooked on a commercial open-flame gas grill. *J. Food Protection* 72:1404-1411.
- DeDonder, S., C.J. Jacob, B. V. Surgeoner, B. Chapman, R.K. Phebus, and D.A. Powell.** 2009. Self-reported and observed behavior of primary meal preparers and adolescents during preparation of frozen, uncooked, breaded chicken products. *British Food Journal* 111(9):915-929.
- Luchansky, J.B., R.K. Phebus, H. Thippareddi, and J.E. Call.** 2008. Translocation of surface inoculated *Escherichia coli* O157:H7 into beef subprimals following blade tenderization. *J. Food Prot.* 71:2190-97.
- Vander Wal, L.S., H. Thippareddi, R.K. Phebus, C.L. Kastner, R.J. Danler, P. Udomvarapont, D.H. Kropf, E.A. Boyle, and M.C. Hunt.** 2006. Microbial validation of a cook-in-bag lamb in curry sauce product. *J. Food Prot.* (submitted; -addressing reviewer comments).
- Stoltenberg, S.K., K.J.K. Getty, H. Thippareddi, R.K. Phebus, and T.M. Loughin.** 2006. Fate of *Escherichia coli* O157:H7 during production of fermented sausage snack sticks made from beef or a venison/beef blend and directly acidified with citric or lactic acid. *J. Food Sci.* 71(6):M228-M235.
- Nightingale, K.K., H. Thippareddi, R.K. Phebus, J.L. Marsden, and A.L. Nutsch.** 2006. Validation of a traditional Italian-style salami manufacturing process for control of *Salmonella* and *Listeria monocytogenes*. *J. Food Prot.* 69:794-800.
- Singh, M., V.S. Gill, H. Thippareddi, R.K. Phebus, J.L. Marsden, T.J. Herald, and A.L. Nutsch.** 2005. Cetylpyridinium chloride treatment of ready-to-eat polish sausages: effects on *Listeria monocytogenes* populations and quality attributes. *Foodborne Pathogens and Disease* 2:233-241.
- Singh, M., V.S. Gill, H. Thippareddi, R.K. Phebus, J.L. Marsden, T.J. Herald, and A.L. Nutsch.** 2005. Antimicrobial activity of cetylpyridinium chloride against *Listeria monocytogenes* on frankfurters and subsequent effect on quality attributes. *J. Food Prot.* 68:1823-1830.
- Singh, M., V.S. Gill, H. Thippareddi, R.K. Phebus, J.L. Marsden, T.J. Herald, and A.L. Nutsch.** 2005. Efficacy of cetylpyridinium chloride against *Listeria monocytogenes* and its influence on color and texture of cooked roast beef. *J. Food Prot.* 68:2349-2355.
- Retzlaff, D.D., R.K. Phebus, C.L. Kastner, J.M. Marsden.** 2005. Establishment of minimum operational parameters for a high volume static chamber steam pasteurization system (SPS 400-SCTM) for beef carcasses to support HACCP programs. *Foodborne Pathogens and Disease* 2:146-151.
- Retzlaff, D.D., R.K. Phebus, A.L. Nutsch, J. Riemann, C.L. Kastner, and J.L. Marsden.** 2004. Effectiveness of a laboratory-scale, vertical tower, static chamber steam pasteurization unit at various time and temperature combinations against pathogens on freshly slaughtered beef. *J. Food Prot.* 67:1630-1633.
- Sindt, J.J., J.S. Drouillard, H. Thippareddi, R.K. Phebus, C.M. Coetzer, K.D. Kerr, D.L. Lambert, T.B. Farran, S.P. Montgomery, and H.J. LaBrune.** 2004. Effect of Maillard reaction products on ruminal and fecal acid-resistant *E. coli*, total coliforms, VFA profiles, and pH in steers. *J. Animal. Sci.* 82:1170-1176.
- Wu, V.C.H., V. Gill, R. Oberst, R. Phebus, D.Y.C. Fung.** 2004. Rapid protocol (5.25 hr) for the detection of

Escherichia coli O157:H7 in raw ground beef by immuno-capture system (Pathatrix) in combination with Colortrix, and CT-SMAC. J. Rapid Meth. Automat. Microbiol. 12(1):57-67.

Oberst, R.D., M.P. Hays, L.K. Bohra, R.K. Phebus, J.M. Sargeant. 2003. Detection of *E. coli* O157:H7 in cattle feces using a polymerase chain reaction--based fluorogenic 5' nuclease (TaqMan[®]) detection assay after secondary enrichment. J. Vet. Diagn. Invest. 15:543-552.

Danler, R.J., E.A.E. Boyle, C.L. Kastner, H. Thippareddi, D.Y.C. Fung, and R.K. Phebus. 2003. Effects of chilling rate on outgrowth of *Clostridium perfringens* spores in vacuum-packaged cooked beef and pork. J. Food Prot. 66:501-503.

Thippareddi, H., K. Juneja, R. K. Phebus, J. Marsden, and C. L. Kastner. 2003. Control of *Clostridium perfringens* germination and outgrowth by buffered sodium citrate during chilling of roast beef and injected pork. J. Food Prot. 66:376-381.

Sindt, J.J., J.S. Drouillard, H. Thippareddi, R.K. Phebus, D.L. Lambert, S.P. Montgomery, T.B. Farran, H.J. LaBrune, J.J. Higgins, and R.T. Ethington. 2002. Evaluation of finishing performance, carcass characteristics, acid-resistant *E. coli* and total coliforms from steers fed combinations of wet corn gluten feed and steam-flaked corn. J. Anim. Sci. 80:3328-3335.

Bohra, L.K., R.D. Oberst, R.K. Phebus, M.P. Hays, R.L. Green, and J.M. Sargeant. 2001. Evaluation of 5' nuclease based detection assays to detect *Escherichia coli* O157:H7 from food products. J. Rapid Meth. Automat. Microbiol. 9:143-160.

Sargeant, B.J.M., J.R. Gillespie, R.D. Oberst, R.K. Phebus, D.R. Hyatt, L.K. Bohra, and J. Galland. 2000. A longitudinal study of *Escherichia coli* O157:H7 on cow-calf farms in Kansas. Am. J. Vet. Res. 61:1375-1379.

Getty, Karr, K. J., R. K. Phebus, J. L. Marsden, D.Y.C. Fung, and C. L. Kastner. 2000. *Escherichia coli* O157:H7 and fermented sausages: A review. J. Rapid Meth. Automat. Microbiol. 8:141-170.

Getty, K.J.K., R.K. Phebus, J.L. Marsden, J.R. Schwenke, and C.L. Kastner. 1999. Control of *Escherichia coli* O157:H7 in large (115 mm) and intermediate (90 mm) diameter Lebanon-style bologna. J. Food Sci. 64:1100-1107.

Oberst, R.D., M.P. Hays, L.K. Bohra, R.K. Phebus, C.T. Yamashiro, C. Paszko-Kolva, J.M. Sargeant, and J.R. Gillespie. 1998. PCR-based amplification and detection of *Escherichia coli* O157:H7 utilizing an internal fluorogenic probe and the 5' nuclease (TaqMan[™]) assay. Appl. Environ. Microbiol. 64:3389-3396.

Nutsch, A.L., R.K. Phebus, M.J. Riemann, J.S. Kotrola, R.C. Wilson, J.E. Boyer, Jr., and T.L. Brown. 1998. Steam Pasteurization[™] of commercially slaughtered beef carcasses: Evaluation of bacterial populations at five anatomical locations. J. Food Prot. 61: 571-577.

Kim, J., K.A. Schmidt, R.K. Phebus, and I.J. Jeon. 1998. Time and temperature of stretching as critical control points for *Listeria monocytogenes* during production of mozzarella cheese. J. Food Prot. 61:116-118.

Phebus, R.K., A.L. Nutsch, D.E. Schafer, R. C. Wilson, M.J. Riemann, J.D. Leising, C.L. Kastner, J.R. Wolf, and R.K. Prasai. 1997. Comparison of steam pasteurization and other methods for reduction of pathogens on freshly slaughtered beef surfaces. J. Food Prot. 60:476-484.

Nutsch, A.L., R.K. Phebus, M.J. Riemann, D.E. Schafer, J.E. Boyer, Jr., R.C. Wilson, J.D. Leising, and C.L. Kastner. 1997. Evaluation of a steam pasteurization process in a commercial beef processing facility. J. Food Prot. 60:485-492.

Marsden, J.L., D.Y.C. Fung, R.K. Phebus, R.K. Prasai, C.L. Kastner, E.A.E. Boyle, H. Thippareddi, and M.A. Vanier. 1996. The role of pathogen testing in validating HACCP critical control points. J. Rap. Meth. Automat. Microbiol. 4:247-250.

Bohra, L.K., Phebus, R.K., and Kastner, C.L. 1995. Influence of glucose oxidase on the growth of *Escherichia coli* O157:H7, *Listeria monocytogenes*, and *Salmonella typhimurium* in Universal Preenrichment Broth. J. Rap. Meth. Automat. Microbiol. 4:87-94.

Karr, K.J., Boyle, E.A.E., Kastner, C.L., Marsden, J.L., Phebus, R.K., Prasai, R.K., Pruett, W.P., and Zepeda, C.M.G. 1995. Standardized microbiological sampling and testing procedures for the beef industry. J. Food Prot. 59:778-780.

Thippareddi, H., Phebus, R.K., Fung, D.Y.C., and Kastner, C.L. 1995. Use of Universal Preenrichment Medium supplemented with Oxyrase[™] for the simultaneous recovery of *Escherichia coli* O157:H7 and *Yersinia enterocolitica*. J. Rap. Meth. Automat. Microbiol. 4:37-50

- Liu, X., Phebus, R.K., Fung, D.Y.C., and Kastner, C.L.** 1995. Evaluation of culture protocols and Oxyrase™ supplementation for *Arcobacter* spp. *J. Rapid Meth. Automat. Microbiol.* 4:115-126.
- Krizek, A.R., Smith, J.S., and Phebus, R.K.** 1995. Biogenic amine formation in fresh vacuum-packaged beef stored at -2 °C and 2 °C for 100 D. *J. Food Prot.* 58:284-288.
- Prasai, R.K., Phebus, R.K., Zepeda, C.M.G., Kastner, C.L., Boyle, E.A.E., and Fung, D.Y.C.** 1995. Effectiveness of trimming and/or washing on microbiological quality of beef carcasses. *J. Food Prot.* 58:1114-1117.
- Fung, D.Y.C., Phebus, R.K., Kang, D.H., and Kastner, C.L.** 1995. Effect of alcohol-flaming on meat cutting knives. *J. Rapid Meth. Automat. Microbiol.* 3:237-243.
- Zepeda, C.M.G., Kastner, C.L., Willard, B.L., Phebus, R.K., Schwenke, J.R., Fijal, B.A., and Prasai, R.K.** 1994. Gluconic acid as a fresh beef decontaminant. *J. Food Prot.* 57:956-962.
- Phebus, R.K., Thippareddi, H., Kone, K., Fung, D.Y.C., and Kastner, C.L.** 1993. Use of Oxyrase^J enzyme in enrichments to enhance the recovery of *Escherichia coli* O157:H7 from culture media and ground beef. *J. Rap. Meth. Auto. Microbiol.* 1: 249-260.
- Phebus, R.K., Draughon, F.A., and Mount, J.R.** 1991. Survival of *Campylobacter jejuni* in modified atmosphere packaged turkey roll. *J. Food Prot.* 54:194-199.

BOOKS CHAPTERS AND VIDEOS AUTHORED

- Kastner, J.K. and R.K. Phebus.** 2004. Chapter 2: Incineration. *In Carcass Disposal: A Comprehensive Review.* Edited by the National Agricultural Biosecurity Center Consortium Carcass Disposal Working Group. Kansas State University, Manhattan, KS.
- Fung, D.Y.C., M.N. Hajmeer, C.L. Kastner, J.J. Kastner, J.L. Marsden, K.P. Penner, R.K. Phebus, J.S. Smith, and M.V. Vanier.** 2001. Meat safety. Hui, et. al. (Ed.). *In Meat Science and Applications.* Marcel Dekker, Inc. pp. 171-205.
- Retzlaff, D.D., S.A. Flores, C.L. Kastner, E.A. Boyle, and R.K. Phebus.** 2000. Applied Meat and Poultry Microbiology Laboratory Modules (10 Video Series). Video Titles: *Plant Sanitation Techniques; Verifying Plant Sanitation; Employee Hygiene and GMPs; Decontamination Treatments for Carcasses and Fabricated Products; Laboratory Design and Safety; Aseptic Techniques; Collection of Product Samples; Sample Storage and Shipment; Media Preparation and Sample Analysis; Laboratory Techniques.* Kansas Regents Educational Communications Center, Kansas State University.
- Kotrola, N.A., Marsden, J.L., Fung, D.Y.C., Phebus, R., and Milner, J.A.** 1996. Cooked meats, poultry, and their products. J. Milner (Ed.). *In LFRA Microbiology Handbook: 2) Meat Products.* Leatherhead Food RA, Leatherhead, Surrey. pp. C-1-39.
- Phebus, R.K.** 1994. Food microbiology. C.J. Arntzen and E.M. Ritter (Eds.). *In Encyclopedia of Agricultural Science,* Vol. 2. Academic Press, Inc., San Diego, CA. pp. 315-326.