2024

Curriculum Vitae

Timothy J. Bowser

Professor
Department of Biosystems and Agricultural Engineering
Robert M. Kerr Food and Agricultural Products Center
Stillwater, OK 74075
Phone: (405) 744-6688
Fax: (405) 744-6313

Education

Ph.D., Agricultural Engineering, The University of Tennessee, 5/94
M.S., Agricultural Engineering, The Pennsylvania State University, 12/86
B.S., Agricultural Engineering, The Pennsylvania State University, 5/84

Professional Registration

Professional Engineer, No. 19992, Oklahoma, No. 145885, Texas

Certifications

FSPCA Preventive Controls for Animal Food, December 2016
HACCP Instructor, July 2014

Interests & Expertise

- Equipment design and application
- Food process design and development
- Facility design
- Waste reduction and utilization
- Continuous improvement
- Clean-In-Place (CIP)

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Experience

6/12 –present Professor, Biosystems and Ag Engineering, Oklahoma State University, Stillwater, OK

- Faculty in Oklahoma's Food and Agricultural Products Center (FAPC), a state-of-the-art facility built to help add value and competitiveness to Oklahoma's food and agricultural products.
- Principal investigator or co-principal investigator on research and development projects with a total funding of $4.6 million.
- Management and expansion of food process engineering extension programs in facility design and process optimization.
- Overall program impact of 984 new jobs created, 86 new facility designs or expansions, and over 200 process optimization projects with 186 unique companies.
- Conceptualization and startup of food process engineering extension programs in facility design and process optimization.
- Formulation and process development of new products including RTE, shelf-stable, semi-moist pet foods.

6/04 – 5/12 Associate Professor, Biosystems and Ag Engineering, Oklahoma State University, Stillwater, OK

1/97 – 5/04 Assistant Professor, Biosystems and Ag Engineering, Oklahoma State University, Stillwater, OK

5/03 – present Co-founder and co-owner, PetMech, LLC, Stillwater, OK

- Development of humane pet product testing techniques.
- Consulting and technical support for pet product manufacturers.
- Testing of pet and animal foods for digestibility.

8/94 – 12/96 Engineering Consultant, Lockwood Greene Engineers, Spartanburg, SC

- Conceptual design and specification of a $65 million aseptic pudding plant (Food Engineering's 1999 Plant of the Year).
- Process design and specification of high-speed, hot-fill equipment for orange-juice processing at 150 gpm.
- Conceptual process planning and design of a multi-part IV bag for a pharmaceutical mfg.
- Conceptual process planning, room layout, equipment specification and utility calculations for a new pharmaceutical facility utilizing blow-fill-seal equipment.

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- Conceptual process planning, design and equipment specification for a shower-gel process.
- Equipment specification for a dentifrice line.
- Conceptual, pilot plant and plant trial studies for a new, microwave popcorn product.

8/91 - 5/94 Graduate Research Assistant, The University of Tennessee, Knoxville, TN

- Recipient of a National Needs Fellowship in food engineering.
- Invention, development and testing of a unique thin-film drying process.
- Developed a numerical model for thin-film drying.

9/88 - 7/91 Project Engineer, Gerber Products Company, Fort Smith, AR

- Responsible for $5 million of capital projects at America's largest baby-food plant.
- Specified, designed and helped to install major components of a $2 million, high-speed juice-filling line.
- Designed and installed a hot-water recovery system for retorts. Annual energy savings of $300,000 and increased steam availability.
- Designed, fabricated and installed unique puree inspection equipment, resulting in over $1.2 million in annual savings.
- Member of Gerber's "Glass Break Team." Developed and implemented methods to reduce glass breakage in filling operations. Reduced breakage by over 50%.
- Member of Gerber's "Waste Reduction Team." Studied and developed methods to reduce processing wastes. Recovered over $300,000 in six months.

11/86 - 8/88 Associate Project Engineer, Gerber Products Company, Fremont, MI

- Responsible for research and development projects carried out at Gerber's headquarters, food processing plants and co-packing facilities.
- Developed, specified, purchased and installed process equipment for a Gerber adult food line. Equipment was installed at a co-packer's plant. The project was installed under budget, on time and at capacity.

5/84 - 6/86 Graduate Asst., The Pennsylvania State University, University Park, PA

- Responsible for research and development sponsored by the Ben Franklin Foundation and commercial sources, on waste heat recovery.
- Helped to develop an experimental setup, collected and analyzed data on waste heat recovery operations for a nuclear power-plant.

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I. Publications

A. Overview

Peer-reviewed publications: 25; Patents and invention disclosures: 3; Book chapters: 10; Professional magazine and web articles: 6; Thesis: 2; Proceedings: 5; ASABE papers: 9; Workbooks: 2; Fact sheets: 36; Manuals: 3.

B. Peer-Reviewed Publications

Jones, C., T. Conley, T. Bowser, N. Maness. Submitted. Estimation of phosphine fumigant dosage using a constant pressure testing method for grain storage bins. Journal of Stored Products Research.

Yerramsetti, P., T. Bowser, R. Ramanathan. 2019. Optimization of head space pressure using liquid nitrogen in hot-packed BBQ sauce. The Open Food Science Journal (11) 74-78.

Bowser, T.J. and R.B. Holcomb. 2018. Financial analysis tools for on-farm and off-farm commercial kitchens. Article #2TOT3. Journal of Extension 56(2).

Collins, C. Kumar, A., Bellmer D. and Bowser T. 2018. Bioenergy from food wastes: thermal decomposition of carbohydrates, lipids, and proteins. Transactions of the ASABE 61(3): 797-805. doi: 10.13031/trans.12494

Bowser, T.J., F. Ojwang, R. Sahs, and L. Brandenberger. 2017. Promotion of orange flesh sweet potato by demonstration of acceptance and food product development. African Journal of Food Science V11(12): 383-388. DOI: 10.5897/AJFS2017.1647

Bowser, T.J., P.R. Weckler, M. Bugg, E. Lam, and J. Chamberlain. 2016. Improved field methods for construction of concrete biosand water filter housings. IJSLE, V 11(1): 32-50.

Brandenberger, L.P., T.J. Bowser, H. Zhang, L.K. Carrier, and M.E. Payton. 2016. Comparison of soil testing kits for accuracy and ease of use. Discourse Journal of Agriculture and Food Sciences Vol 4(1): 1-10.

Bowser, T.J., M. Mwavita, A. Al-Sakini, W. McGlynn, N. Maness. 2014. Quality and shelf life of fermented lamb meat sausage with rosemary extract. The Open Food Science Journal. Vol 8: 22-31.

Mathankar, S., P.R. Weckler, T.J. Bowser. 2013. X-ray applications in food and agriculture: a review. Transactions of the ASABE. Vol. 53(3): 1227-1239.

Abramson, C.I., A. Lay, T.J. Bowser, C.A. Varnon. 2012. The use of silver vine (*Actinidia Polygama* Maxim, Family Actinidiacaea) as an enrichment aide for felines: issues and prospects. American Journal of Animal and Veterinary Sciences. Vol 7(1): 21-27.

Bowser, T.J., R. Scott Frazier, and Raghavendra Rao Kakarala. 2011. Improvement of efficiency and environmental impact of a low-cost food dehydrator. The Open Food Science Journal. Vol. 5: 37-41.

Mathanker, S.K., P.R. Weckler, N. Wang, T.J. Bowser, and N.O. Maness. 2011. AdaBoost classifiers for pecan defect classification. Computers and Electronics in Agriculture 77(1): 60-68.

Mathankar, S.K., P.R. Weckler, N. Wang, T.J. Bowser, and N.O. Maness. 2010. Local adaptive thresholding of pecan X-Ray images: Reverse water flow method. Transactions of the ASABE, St. Joseph, MO 53(3): 961-969.

Bowser, T.J., R.S. Frazier, P.R. Weckler, S.J. Kowalski. 2009. Optimizing jerky drying time with minimal product impact. The Open Food Science Journal. V3: 79-83.

Choudhary, R., T.J. Bowser, P.R. Weckler, and N.O. Maness. 2009. Rapid estimation of lycopene concentration in watermelon and tomato puree by fiber optic visible reflectance spectroscopy. Postharvest Biology and Physiology, 52(1). 103-109.

Bowser, T.J. and P.R. Weckler. 2008. Validation guidelines for a jerky pasteurization process in a low-cost dehydrator. The Open Food Science Journal. V2: 43-48.

Bowser, T.J., C.I. Abramson and D. Bennett, 2006. Low-cost in vitro Screening Method for Digestibility of Pet Chews. American Journal of Animal and Veterinary Sciences 1 (2): 23-26.

Bowser, T.J., P.R. Weckler, K.N. Patil, C. DeWitt. 2005. Design and testing of a low-cost, pilot-scale batch gasifier for food processing byproducts. Applied Engineering in Agriculture. Vol. 21(5): 901-906. American Society of Agricultural and Biological Engineers, St. Joseph, MI.

K. Patil, T.J. Bowser, D. Bellmer, and R. Huhnke. 2005. Fluidization Characteristics of Sand and Chopped Switchgrass-Sand Mixtures. Agricultural Engineering International: the CIGR Ejournal. Manuscript EE 04 005. Vol. VII. Website: cigr-ejournal.tamu.edu

Bowser, T.J., P.R. Weckler, and R. Jayasekara. 2003. Design parameters for operation of a steam injection heater without water hammer when processing viscous food products. Applied Engineering in Agriculture. Vol. 19, No. 4. Society for Engineering in Agriculture, Food, and Biological Systems, St. Joseph, MI.

Muriana, P.M., T.J. Bowser, C. Davidson, M. Tilahun and D.E. Gibbs. 2003. Potential Application of a Direct Gas-Fired Water Heater for “Flash Pasteurization” of Microbially-Contaminated Food Processing Streams. Food Microbiology, Elsevier Science Ltd. Vol 20(1): 77-82.

Bowser, T.J. 2000. Development and Evaluation of a Novel Cutter Separator for Food and Agricultural Products. Applied Engineering in Agriculture. Vol 16(6): 671-676. St. Joseph, MI: ASAE.

Bowser, T.J. and L.R. Wilhelm. 1996. A water-vapor permeable drying surface for thin films. Transactions of the ASAE. 39(2):617-623.

Bowser, T.J. and L.R. Wilhelm. 1995. Modeling simultaneous shrinkage and heat and mass transfer of a thin, nonporous film during drying. Journal of Food Science. 60(4):753-757.

C. Patents and Invention Disclosures

Bowser, T.J., Hiziroglu, Salim, and Jessica Lay. 2010. EZ-Mulch Mat invention disclosure. Received and recorded by Oklahoma State University OIPM, number 2010.35 (result of the Senior Design Mulch Mat project).

Bowser, T.J. 2009. Method for making pet and animal comestibles. U.S. Provisional Patent 61121630.

Bowser, T.J. and D. Vadder. 2002. Spring cutter-separator. U.S. Patent 6,357,681, March 19.

D. Book Chapters

Bowser T.J. 2019. Food processing facility design, in the Food Machinery Handbook (3rd edition), Myer Kutz, editor. Elsevier, Inc., Academic Press: 623-649.

Bowser T.J. 2019. Sanitary pump selection and use, in the Food Machinery Handbook (3rd edition), Myer Kutz, editor. Elsevier, Inc., Academic Press: 651-672.

Bowser T.J. 2013. Food processing facility design, in the Food Machinery Handbook (2nd edition), Myer Kutz, editor. Elsevier, Inc.: 571-597.

Bowser T.J. 2013. Sanitary pump selection and use, in the Food Machinery Handbook (2nd edition), Myer Kutz, editor. Elsevier, Inc.: 599-617.

Bowser T.J. Mechanical separation design. 2012. In Handbook of Food Process Design, J. Ahmed, and M.S. Rahman, editors; Wiley-Blackwell Publishing. New York. pgs 811-830.

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Bowser T.J. Steam infusion heating. 2010. Encyclopedia of Agricultural and Food Engineering, 2nd ed. Dr. Dennis R. Heldman, editor, Marcel Dekker, New York.

Bowser T.J. Steam injection heating. 2010. Encyclopedia of Agricultural and Food Engineering, 2nd ed. Dr. Dennis R. Heldman, editor, Marcel Dekker, New York.

Bowser T.J. 2007. Food processing facility design. Food Machinery Handbook. Myer Kutz, editor, William Andrew Publishing, New York.

Bowser T.J. Steam Infusion Heating. 2003. Encyclopedia of Agricultural and Food Engineering. Dr. Dennis R. Heldman, editor, Marcel Dekker, New York.

Bowser T.J. Steam Injection Heating. 2003. Encyclopedia of Agricultural and Food Engineering. Dr. Dennis R. Heldman, editor, Marcel Dekker, New York.

E. Professional Magazine and Web Articles

Bowser, T.J. 2013. Industry needs 3-A: Let's Respond. 3-A Sanitary Design Connections. Quarterly e-newsletter, 2nd Quarter 2013. 3-a.org.

Bowser, T.J. 2011. Injuries in food manufacturing. Published in the TASA Group Knowledge Center. www.tasanet.com.

Bowser, T.J. 2011. Design-build disputes in construction of food processing facilities. Published in the TASA Group Knowledge Center. www.tasanet.com.

Bowser, T.J. 2007. CIP Tutorial. CleanRooms Magazine. John Haystead, editor in chief. PennWell Corp., Tulsa, Oklahoma, Vol. 21(2).

Bowser, T.J. 2006. Metal detector traits. Food Industry Magazine, BPA Worldwide Business, published by Eastern Trade Media Pte Ltd., Singapore, Vol 18(4): 28-31.

Bowser, T.J. 2005. Palatability Services. Petfood Industry® Magazine. Watt Publication. Vol 47(9): 6, 8.

Bowser, T.J. 2002. "When it needs to be cleaned" Sanitary Pump Selection Guide. Pumps and Processes Magazine, InterMarket Publishing, LLC. May/June issue.

F. Theses

Bowser T.J. 1994. Thin film drying on a permeable surface. Ph.D. Diss., Univ. of Tennessee, Knoxville.

Bowser, T.J. 1986. Water film heat flow predictions for a surface-heated greenhouse. M.S. thesis, Pennsylvania State Univ., University Park.

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G. Proceedings

Bowser, T.J. 2010. Selection of food processing systems for Dornad. Presented at the 1st International Forum for Mongolia Development, June 30th and July 1st, Ulaanbaatar. Published in the proceedings, pgs 102-105.

Bowser, T.J**.** 2009. OSU Small Scale Dehydrator. Proceedings of the International Conference on Food Technology (INCOFTECH 2009). Indian Institute of Crop Processing Technology, Thanjavur, Tamil Nadu, India.

Bowser, T.J. 2009. Food and Agricultural Products Center –Experiences at Oklahoma State University. Proceedings of the International Conference on Food Technology (INCOFTECH 2009). Indian Institute of Crop Processing Technology, Thanjavur, Tamil Nadu, India.

Bowser, T.J. and C.I. Abramson. 2006. “Citizen Scientists: Feline in-home palatability tests. Proceedings of the 2006 Focus on Palatability conference in Chicago, IL, sponsored by Watt Publishing Co.

Bowser, T.J. and C.I. Abramson. 2006. “In-home animal product evaluation using the Citizen Scientist™ program”. Proceedings of the 2006 Alltech Annual Feed Industry Symposium in Lexington Kentucky sponsored by Alltech, Inc., Lexington, KY.

H. ASABE Papers

Mathanker, S.K., P.R. Weckler, N. Want, T.J. Bowser, N.O. Maness. 2009. Adaptive thresholding of pecan X-ray images using water flow models and feature extraction. ASABE paper number 096052. American Society of Agricultural and Biological Engineers, St. Joseph, MI.

Patil, K.N., T.J. Bowser, D.D. Bellmer and R.L. Huhnke. 2004. Design, development, testing and evaluation of a laboratory scale cyclone gasification system. Paper number 046077. American Society of Agricultural and Biological Engineers, St. Joseph, MI.

Rao, B., T.J. Bowser, and P.R. Weckler. 2004. Gasification of food and agricultural processing byproducts –an economic waste handling alternative. ASABE paper number 046143. American Society of Agricultural and Biological Engineers, St. Joseph, MI.

Choudhary, R., T.J. Bowser, P.R. Weckler, N.O. Maness. 2004. Rapid estimation of lycopene concentration in watermelon and tomato puree by visible reflectance spectroscopy. ASABE paper number 046119. American Society of Agricultural and Biological Engineers, St. Joseph, MI.

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Jones, C.L., T.J. Bowser, P.R. Weckler. 2003. Feasibility of steam generation form gasified pork-processing byproducts. Paper number 036176. American Society of Agricultural and Biological Engineers, St. Joseph, MI.

Patil, K.N., T.J. Bowser, D.D. Bellmer, and R.L. Huhnke. 2003. Fluidization characteristics of sand and chopped switchgrass-sand mixtures. ASABE paper number 036176. American Society of Agricultural and Biological Engineers, St. Joseph, MI.

Bowser, T.J., P.N. Walker, H.B. Manbeck and D.J. Meyer. 1984. The effects of condensation on a polytube heat exchanger. ASAE paper No. NAR84-407.

Bowser, T.J. and L.R. Wilhelm. 1993. A permeable conduction dryer for thin films. ASAE paper No. 93-6580. St. Joseph, MI: ASAE.

I. Workbooks

Bowser, T.J. 2004. Quick reference guide: continuous process improvement program for food and agricultural products processors.

Bowser, T.J. 1998. Process engineering method for food and agricultural products. Circular E-959.

J. Fact Sheets

Bowser T.J. What is clean in place (CIP)? 2023. Fact Sheet FAPC-251.

Bowser T.J. & Ravi Jadeja. Creating process Flow diagrams for food and ag. 2023. Fact Sheet FAPC-250.

Bowser, T.J. Vibration table for food processing. 2022. Fact Sheet FAPC-246.

Bowser, T.J. and H. Vora. 2022. 3-D printed parts for food contact. Fact Sheet FAPC-244.

Bowser, T.J. and J. Nelson. 2021. Slaughterhouse water use and wastewater characterization. Fact Sheet FAPC-240

Bowser, T.J. and W. Bowser, W. 2020. Automatic pneumatic cutter. Fact Sheet FAPC - 234.

Bowser, T.J. 2019. Filler identification and selection for liquid foods. Fact Sheet FAPC – 229.

Bowser, T.J. 2017. Solar dehydrator construction plans. Fact Sheet FAPC-201.

Mackey, B., T. Bowser, and P. Weckler. 2017. Low-cost pecan sanitizer plans for small-scale producers. Fact Sheet FAPC - 208

Bowser, T.J., C.C. Craige, M.D. Buser, and B.D. Adam. 2017. How traceability is used in beef carcass processing. Fact Sheet NWCTI-07.

Yerramsetti, P, and T.J. Bowser. 2017. What is a processing aid? Fact Sheet FAPC – 205.

Bowser, T.J. 2016. Reducing water use in food processing. Fact Sheet FAPC-204.

Bowser, T.J. and R. Jadeja. 2016. Strategies to reduce moisture condensation in food facilities. Fact Sheet FAPC-203.

Bowser, T.J. and R.S. Frazier. 2013. Dehydrator exhaust recirculation for energy savings. Fact Sheet FAPC-181.

Bowser, T.J. 2012. Water Use in the Food Industry. Fact Sheet FAPC-180.

Bowser, T.J. and R. Scott Frazier. 2011. Dehydrator optimization: reduction of energy use and carbon emissions. Fact Sheet FAPC-175.

Bowser, T.J. 2010. Carbon Strategy for the Food Industry. Fact Sheet FAPC-172.

Bowser, T.J. 2010. Carbon Footprinting for the Food Industry. Fact Sheet FAPC-174.

Bowser, T.J., J. Nelson, and S.J. Kowalski. 2009. Reduction of drying time for jerky products. Fact Sheet FAPC-166.

Bowser, T.J. and J. Nelson. 2008. Consistent lethality treatment for small-scale jerky dehydrators. Fact Sheet FAPC-165.

Bowser, T.J. and B. Smith. 2007. Gas oven optimization –waste reduction. Fact Sheet FAPC-156.

Bowser, T.J. 2006. Compressed air systems –waste reduction. Fact Sheet FAPC-151.

Bowser, T.J. 2005. Steam Basics for Food Processors. Fact Sheet FAPC-142.

Scott, D.D., W.G. McGlynn, T.J. Bowser. 2005. Measuring equipment for food product development and manufacturing. FAPC-144

Scott, D.D., T.J. Bowser, W.G. McGlynn. 2004. Food product labeling basics. Fact Sheet FAPC-140.

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Scott, D.D., T.J. Bowser, W.G. McGlynn. 2003. Scaling up your food process. Fact Sheet FAPC-141.

Bowser, T.J. and R. Choudhary. 2002. Explanation of Sanitary Fittings and Tubing for Food Processors. Fact Sheet FAPC-127.

Bowser, T.J. and J. Young. 2002. Process and facility sanitation for food processors. Fact Sheet FAPC-121.

Bowser, T.J. Steam Kettle hookup. 2002. Fact Sheet FAPC-120.

Bowser, T.J. and M. Tilahun. 2001. Container cleaning in food processing operations. Fact Sheet FAPC-110.

Bowser, T.J. Sanitary pump selection. 2001. Fact Sheet FAPC-108.

Bowser, T.J. and C.I. Abramson. 2001. Oklahoma State University center for pet and animal food palatability studies. Fact Sheet FAPC-122.

Bowser, T.J. 2000. Planning the engineering design of a food processing facility. Fact Sheet FAPC-104

Bowser, T.J. 2000. Metal detectors for food processing. Fact Sheet FAPC-105.

Bowser, T.J. 1999. Selecting and purchasing used food processing equipment. Fact Sheet FAPC-113.

Bowser, T.J. 1998. Selecting and purchasing food processing equipment. Fact Sheet FAPC-102.

K. Manuals

Bowser, T.J. 2012. Jerky dehydrator construction and operation manual, 2nd edition, Manual available for download from the FAPC website; www.fapc.okstate.edu.

Bowser, T.J. 2006. CIP unit construction and operation manual. Manual available for download from the FAPC website; www.fapc.okstate.edu.

Bowser, T.J. 2006. Jerky dehydrator construction and operation manual. Manual available for download from the FAPC website; www.fapc.okstate.edu.

II. Presentations and Lectures

A. Overview

Invited lectures: 28; Professional lectures: 37; Workshops led by Bowser: 20; Workshop presentations: 41.

B. Invited Lectures

Bowser T.J. 2023. Interweaving Cleaning, Sanitizing and Maintenance in Screening-Separation. National webinar sponsored by Powder & Bulk Solids magazine, April 12th.

Bowser, T.J. 2022. Screening/Separation at Critical Control Points. National webinar sponsored by Powder & Bulk Solids magazine, April 13th.

Bowser, T.J. 2021. Food Processing. Presented to the Universidad Técnica Nacional (UTN) in Costa Rica, via videoconference. Oklahoma State University, October 6th.

Bowser, T.J. 2021. Low-cost equipment for measuring texture in food materials. Pawnee Nation College Scholars Conference, Oklahoma State University, July 28th.

Bowser T.J. 2020. Make food safe again: remove foreign metals. National webinar sponsored by Powder & Bulk Solids magazine, June 2nd.

Bowser, T.J. 2019. Improving quality of life –U.S. Roaster Corp. & DASNR. Oklahoma Section ASABE Meeting, Oklahoma State University, February 22nd.

Bowser, T.J. 2018. Water treatment in developing areas. Global Horticulture Conference, at Wes Watkins International Building, sponsored by OCES, November 8th.

Bowser, T.J. 2016. Cleaning & Sanitizing in Small and Very Small Plants. FSIS Science & Technology Seminar Series, June 21st.

Bowser, T.J. 2016. Soil Testing. Field methods class, WaTER Center, Norman Oklahoma, May 26th.

Bowser T.J. 2014. Food Engineering and Agricultural Practices; 5 separate topics. Pioneer Missions Conference, Mwanza, Tanzania. May 1st.

Bowser T.J. 2014. Water & Food Processing. World Water Day 2014, March 24th OSU broadcast live on OstateTV.

Bowser, T.J. 2013. Food Engineering; 11 separate topics. Catholic University of Mozambique, Chimoio.

Bowser, T.J. 2012. Where does 3-A fit?: Emerging industry needs. Annual meeting of 3-A Sanitary Standards, Inc., Milwaukee, Wisconsin.

Bowser, T.J. 2012 Post-Harvest Vegetable Processing Facilities for Vegetables. Annual Oklahoma Vegetable Production and Marketing meeting, Chickasha Oklahoma.

Bowser, T.J., L. Brandenberger, Y. Chang, P. Weckler, T. Snider. 2010. Food Processing. Three-week, three credit lecture class taught during the spring intersession. Mongolian International University, Ulaanbaatar, Mongolia.

Bowser, T.J. 2010. Process design overview: where opportunities exist in the processing plant. The presentation was given as part of an on-line webinar held

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on April 14th and sponsored by Meatingplace.com. Name of webinar was “Links to a better bottom line: boosting yield and ROI in sausage production”.

Bowser, T.J., L. Brandenberger, P. Weckler, J. Brown. 2009. Food Processing. Three-week, three credit lecture class taught during the spring intersession. Mongolian International University, Ulaanbaatar, Mongolia.

Bowser, T.J. 2009. OSU Small Scale Dehydrator. International Conference on Food Technology (INCOFTECH 2009). Indian Institute of Crop Processing Technology, Thanjavur, Tamil Nadu, India.

Bowser, T.J. 2009. Food and Agricultural Products Center –Experiences at Oklahoma State University. International Conference on Food Technology (INCOFTECH 2009). Indian Institute of Crop Processing Technology, Thanjavur, Tamil Nadu, India.

Bowser, T.J. 2009. Agricultural missions and outreach. Lecture given at the Annual meeting of the Louisiana Baptist Agricultural Missions Fellowship, Monroe, Louisiana.

Bowser, T.J., L. Brandenberger. 2009. Missions and Careers. Key-note lecture at Vision 2009 meeting, Tulsa, Oklahoma.

Bowser, T.J. and C.I. Abramson. 2006. “Citizen Scientists: Feline in-home palatability tests. 2006 Focus on Palatability conference in Chicago, IL, sponsored by Watt Publishing Co.

Bowser, T.J. and C.I. Abramson. 2006. “In-home animal product evaluation using the Citizen Scientist™ program”. 2006 Alltech Annual Feed Industry Symposium in Lexington Kentucky sponsored by Alltech, Inc., Lexington, KY.

Bowser, T.J. 2002. Processing / handling of agricultural products. PE review class at ASAE 2002 International meeting, Chicago, IL.

Huhnke, R.L., B.G. Cateni, T.J. Bowser, D.D. Bellmer, R.P. Datar, and R.S. Lewis. 2002. Grassohol: converting grasses and residues into ethanol and other products. Invited paper presented at APUF (ag products utilization forum), Kansas State University, 11-13 Nov 2002.

Bowser, T.J. 2000. Biomass Gasification and Syngas Fermentation to Produce Ethanol. Agricultural Products Utilization Forum; Creating Value for Agricultural Resources. Kansas State University. Gita N. Ramaswamy, Chair.

Bowser, T.J. 2000. Development and Processing of Exotic Pet Foods. Agricultural Products Utilization Forum; Creating Value for Agricultural Resources. Kansas State University. Gita N. Ramaswamy, Chair.

Muriana, P. and T.J. Bowser. 1998. Water Pasteurization for use and recycling in food processing. First NSF International Conference on Food Safety. Albuquerque, NM.

C. Professional Lectures

T.J. Bowser and J. Zabienski. 2020. Food engineering at Oklahoma State University. Annual meeting of the Oklahoma Society of Professional Engineers, Tulsa.

R.B. Holcomb, T.J. Bowser, and P.K. Kenkel. 2019. Development of a Micro-Distillery Financial Feasibility Template for Extension and Education Purposes PowerPoint

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presentation at the annual Food Distribution Research Society conference held in Seattle, WA.

Achanta, M., L. Holliday and T. Bowser. 2018. Development of a Vegetarian Pet Treat to Enhance Skin and Coat Health in Dogs. Oral Presentation at the 2018 Research Symposium, R.M. Kerr Food & Agricultural Products Center, Oklahoma State University, Stillwater.

Spencer, C., T. Bowser, D. Jolliff and C. Cox. 2018. Development of a Low-cost Control Scheme Based on Light Reflectance for Coffee Roasters. Oral Presentation at the 2018 Research Symposium, R.M. Kerr Food & Agricultural Products Center, Oklahoma State University, Stillwater.

Bhargava, S., M. Bugg, T. Bowser, R. Ramanathan and R. Jadeja. 2017. Efficiency of a carbon pre-filter for removal of heavy metals from drinking water in developing areas. Poster at the 2017 Research Symposium, R.M. Kerr Food & Agricultural Products Center, Oklahoma State University, Stillwater.

Ojwang, R., T. Bowser, D. Scott, L. Carrier, and L. Brandenberger. Sweet Potato Sensory Evaluation. September 29, 2015. Poster at the 6th Annual Sweet potato for Profit and Health Initiative (SPHI) exhibition, Kigali, Rwanda.

J. Collins, A. Kumar, T. Bowser, and D. Bellmer. 2014. Biofuels from Food Wastes: Thermal Degradation Properties of Fats, Carbohydrates, and Proteins. Poster at the American Chemical Society Meeting, Dallas, Texas.

M. Buser, B. Adam, T. Bowser, B. Mayfield, J. Thomas, P. Crandall, S. Ricke. 2013. Concept of a stakeholder-driven whole-chain traceability system for beef cattle. Poster at the 2013 ASABE Oklahoma Section meeting, Oklahoma State University, Stillwater.

Weckler, P., J. Hardin, T. Bowser, K. Moore. 2013. Development of a low-cost small scale sanitizer for in-shell pecans. Oklahoma Pecan Growers' Association Annual Meeting. Ardmore, Oklahoma.

Weckler, P., T. Bowser, J. Kinder, M. Smith, Ma, L. 2012. Development of low-cost small scale sanitizer for in-shell pecans. Annual meeting of the American Society of Agricultural and Biological Engineers, Dallas, Texas.

Rao Kakarala, T. Bowser. 2010. Improving energy efficiency of the dehydrator and exhaust heat recovery. Poster presentation at the Annual FAPC Research Symposium, Oklahoma State University, Stillwater.

S. Mathanker, P. Weckler, T. Bowser, N. Wang, N. Maness, G. Fan, and M. Stone. 2010. Support Vector Machine and Adaboost X-ray Defect Detection for Pecan.

Presentation at the Annual FAPC Research Symposium, Oklahoma State University, Stillwater.

Bowser, T.J., P. Weckler, J. Brown. 2009. Experiences in Mongolia. Graduate Seminar, Biosystems and Agricultural Engineering Department, Oklahoma State University.

S. Kowalski and T.J. Bowser. 2009. Optimizing drying time without affecting final product. Poster presentation at the Annual FAPC Research Symposium, Oklahoma State University, Stillwater.

Bowser, T.J., R. Jordan, G. Hodgkins. 2008. Integrating agricultural science and faith in outreach programs. Poster presentation at the National Faculty Leadership Conference, Washington, DC.

J. Kovar and T.J. Bowser. 2006. “Evaluation of the mixing capability of a low-cost, sanitary, food-grade mixer. 2006 Annual FAPC Research Symposium, Oklahoma State University, Stillwater.

DeWitt, Cynthia Bower, Liz Brown, Sunny Rice, and T.J. Bowser. 2006. Oral presentation: Gasification. Can it work for small seafood processors? 2006 Pacific fisheries technologists 57th annual meeting, Anchorage, AK.

Patil, K.N., T.J. Bowser, D.D. Bellmer and R.L. Huhnke. 2005. Investigations on a Cyclone based downdraft gasification system. 2005 International Meeting. American Society of Agricultural and Biological Engineers, St. Joseph, MI.

Bangera, H., P.R. Weckler, T.J. Bowser, and N.O. Maness. 2004. Design of a watermelon pulp fruit and juice extraction machine. 2004 FAPC Research Symposium.

Jeyamkondan, S., G. Kranzler, B. Morgan, P. Weckler, and T. Bowser. 2004. Non-destructive methods for predicting beef tenderness. 2004 FAPC Research Symposium.

Choudhary, R., T.J. Bowser, N.O. Maness, W. McGlynn, P. Weckler and M. L. Stone. 2004. Rapid sensing of lycopene in watermelon and tomato using visible spectroscopy. 2004 FAPC Research Symposium.

Rao, B.R., P.R. Weckler, and T.J. Bowser. 2004. Gasification of food processing byproducts – an economic waste handling technique.2004 FAPC Research Symposium.

Cateni, B.G., D.D. Bellmer, R.L. Huhnke, and T.J. Bowser. 2004. Effect of switchgrass moisture content on producer gas composition and quality from a fluidized bed gasifier. 2004 FAPC Research Symposium.

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K.N. Patil, T.J. Bowser, D.D. Bellmer, and R.L. Huhnke. 2004. Cyclone gasification of food byproducts: A preliminary study. 2004 FAPC Research Symposium.

Cateni, B.G., D.D. Bellmer, R.L. Huhnke and T.J. Bowser. 2003. Effect of moisture content on producer gas composition and quality from a fluidized bed gasifier. 2003 ASAE Annual Meeting.

Bowser, T.J. 2002. Design parameters for operation of a steam injection heater without water hammer when processing viscous food products. Oral presentation at the 2002 Annual ASAE meeting.

Bowser T.J**.** 2002. Temperature profiling of continuous ovens used for processing food and agricultural products in Oklahoma. Oral presentation at the 2002 Annual ASAE meeting.

R.S. Lewis, R.P. Data, R.S. Tanner, B.G. Cateni, T.J. Bowser, D.D. Bellmer, and R.L. Huhnke. 2002. Making the connection: conversion of biomass-generated producer gas to ethanol. AIChE annual meeting.

Bowser, T.J**.**, P.R. Weckler and R. Jayasekara. 2002. Process design and operation of a steam injection heater for viscous food and agricultural products (poster). Research Symposium presented by the Oklahoma Food and Agricultural Products Research and Technology Center. Peter M. Muriana, Chair.

Bowser, T.J., D.D. Bellmer, B.G. Cateni, M.M. Lelo, and R.L. Huhnke. 2001. Synthesis gas composition from a fluidized bed gasifier as affected by biomass feedstock type and characteristics. Oral presentation at the ASAE annual International meeting.

Lewis, R.S., R.S. Tanner, T.J. Bowser, D.D. Bellmer, and R.L. Huhnke. 2001. Gasification/Bioconversion Process to Convert Biomass into Ethanol – A Holistic Approach. Oral presentation with abstract at the 23rd Symposium on Biotechnology for Fuels and Chemicals, Breckenridge, CO.

Bowser, T.J., B. Cateni, D. Bellmer Lelo B., and R. Huhnke. 2001. Synthesis gas composition from a fluidized bed gasifier as affected by biomass feedstock type and characteristics. 2001. ASAE International Meeting, Sacramento, CA

Bowser, T.J. 2001. Development and evaluation of a novel cutter separator for food and agricultural products. Research …at your fingertips. Research Symposium presented by the Oklahoma Food and Agricultural Products Research and Technology Center. Peter M. Muriana, Chair.

Abramson, C.I. and T.J. Bowser. 2001. Development of the FAPRTC pet food testing center with special reference to the “Citizen Scientist” program (poster). Research …at your fingertips. Research Symposium presented by the

Oklahoma Food and Agricultural Products Research and Technology Center. Peter M. Muriana, Chair.

Fan, Q. and T.J. Bowser. 2001. Super absorbent polymer gels for recovery and concentration of liquid foods and liquid food waste products (poster). Research …at your fingertips. Research Symposium presented by the Oklahoma Food and Agricultural Products Research and Technology Center. Peter M. Muriana, Chair.

Lelo, B., T.J. Bowser and D. Bellmer. 2001. Biomass gasification and analysis of synthesis gas (poster). Research …at your fingertips. Research Symposium presented by the Oklahoma Food and Agricultural Products Research and Technology Center. Peter M. Muriana, Chair.

Quimby, B., P. Muriana, T. Bowser, C. Davidson, M. Tilahun and D. Gibbs. 2001. Potential application of the Webco QuikWater ™ heater for flash pasteurization of microbially-contaminated food processing streams (poster). Research …at your fingertips. Research Symposium presented by the Oklahoma Food and Agricultural Products Research and Technology Center. Peter M. Muriana, Chair.

Tiew, B.S. and T.J. Bowser. 2001. Thermal model of a direct-fired water heater (poster). Research …at your fingertips. Research Symposium presented by the Oklahoma Food and Agricultural Products Research and Technology Center. Peter M. Muriana, Chair.

Lelo B., T.J. Bowser, B. Cateni, D. Bellmer and R. Huhnke. 2000. Synthesis gas composition from a fluidized bed gasifier as affected by biomass feedstock type and characteristics. ASAE International Meeting, Milwaukee, WI.

Bowser, T.J. 1998 Turtle Food Processing. ASAE Oklahoma Section Meeting, Stillwater, OK.

D. Workshops led by Bowser

Sanitary design workshop. 2016, 2021-2023. Annual workshop for food industry professionals focusing on facility and equipment design, materials of construction, and cleaning methods. Held at Oklahoma State University. Co-led by Dr. Randy Roark (2016), Dr. Ravi Jadeja (2021, 2022 and 2023) and Mr. Bob Mackey (2016).

Production of Pet Products workshop. 2019. Workshop for industry professionals focusing on injection molding and digestibility. Held at Oklahoma State University.

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Solar Dehydrator Theory and Construction workshop. 2019. Teach basics of solar dehydration of food and design and construction of solar dehydrators. Held at the Pawnee Nation College, Pawnee, Oklahoma.

Continuous Improvement Workshop series. 2019. Teach theory and applied examples of continuous improvement for energy bar processor. Held monthly, on site at KiZE Concepts, LLC, Oklahoma City.

Solar dehydrator theory, construction and use, and food preparation for dehydration 2016. Held at three locations in Nicaragua. Hands on application of construction and dehydration of native foods. Sponsored by USAID.

Biosand water filter construction and use, energy-efficient stove theory, construction and use, and soil fertility workshop. 2015 Held at Mwanza, Tanzania. Hands on application of water filtration, energy efficient cook stoves, and concepts of soil fertility.

FMSA overview workshop and lecture. 2015. Held at Tanglewood Resort in Texas for Triangle Insurance Companies of Enid. Co-presented with Dr. Ravi Jadeja on the topic of FMSA for feed and grain producers.

Food Processing and Agriculture. 2014. Hands on application of drip irrigation techniques at the Pioneer Mission Conference in Mwanza, Tanzania.

Meat processing, HACCP and Sanitation. 2013. Three workshops developed and presented to meat processors in Ethiopia. Co-led by Kyle Flynn.

Meat processing, HACCP and Sanitation. 2012. Workshops developed and presented to meat processors in Kenya

Cheesemaking. 2011 and 2010. A workshop teaching basic concepts and hands-on applications of cheesemaking.

Continuous Process Improvement. 2010, 2009, 2007, 2005, 2004. A workshop teaching concepts of continuous improvement for food processors, co-led by Jason Young.

Quality 101. 2010, 2009, 2008. Basic concepts of product/process quality for food processors, co-led by Jason Young.

Lean 101. 2007, 2006. A workshop teaching concepts of lean manufacturing to food processors, co-led by Jason Young and the Oklahoma Manufacturer's Alliance.

Clean-In-Place (CIP). 2005 and 2010. Workshop developed specifically for BAMA Foods. Focused on automated cleaning of food processing equipment.

Winery Sanitation. 2005. Automated and manual sanitation methods for winery owners, co-led by William McGlynn.

Freezer operation, assessment and optimization for food and ag products. 2002.

Gas oven operation, assessment and optimization for food and ag products. 2001.

E. Workshop/Outreach Presentations

Sanitation workshop, annually 2019-2023. Lectured on sanitation in facility design and processing. Course held at Oklahoma State University. Course Leader: Dr. Ravi Jadeja.

Verification and Validation Workshop. 2017. Presented on validation of processes and equipment. Course held on January 27th at Oklahoma State University. Course Leader: Mr. Jason Young.

Preventive Controls for Animal Food Course. 2016. Trained industry professionals and students on the new preventive controls rules and implementation strategy written by the FDA specifically for the animal and pet food industry. I presented sessions on process and sanitation preventive controls. Course held on December 13-15 at Oklahoma State University. Course Leader: Dr. Ravi Jadeja.

Sanitation Workshop. 2016. Trained food industry professionals and students on equipment selection and facility design to promote improved sanitation. Held on May 19th at Oklahoma State University.

Field Methods Workshop 2016. Water Technologies for Emerging Regions (WaTER) Center at OU in Norman. Lectured and gave demonstrations on field methods for soil testing and improvement of soil fertility for rural farms.

Oklahoma Audit Alliance (OAA) 2015. Trained food industry professionals and students to participate in the OAA.

McGlynn, W.G. and T.J. Bowser. 2015. Oral presentation: "Food Processing Equipment" given at the "Plan, Produce, Profits" workshop on February 21 at the University of Arkansas.

Field Methods Workshop 2015. Water Technologies for Emerging Regions (WaTER) Center at OU in Norman. Lectured and gave demonstrations on construction of forms for biosand water filters and the design and methods of construction of energy-efficient wood-fired cooking stoves.

Adam, Brian D., Michael D. Buser, Blayne Mayfield, Johnson Thomas, Rodney Holcomb, Tim Bowser, Ashwin Kumar, Krishna Palepu, Phil Crandall, and Steve Ricke. 2015. "Whole-Chain Traceability – Information Sharing from Farm to Plate

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and Back Again: An Application to the Beef Sector." Presented at China Agricultural University, College of Economics and Management, June 8.

Food Why's 2014. Described why some food products are packed in bags or pouches that are flushed with inert gas. Short presentation was recorded on video and aired on the OSU Sunup program and also posted on the internet.

Ethiopia project report 2014. Description of workshops and training provided to meat processors in Ethiopia in 2013. Presented to the First Christian Men's Group, Stillwater, Oklahoma, on April 12.

Mozambique project report 2013. Description of food engineering training provided for faculty and students at the Catholic University of Mozambique. Presented at the Masters of International Ag seminar and the BAE Grad Student seminar.

HACCP Workshop. 2012. Co-presented basic HACCP principles to employees and management of Otis Spunkmeyer manufacturing facility in Vinita, Oklahoma.

Kenya project report, 2012. Description of objectives and results of Farmer-to-Farmer project completed in Nairobi and Mombasa, Kenya. Presented two different audiences at OSU and to two civic organizations.

Tajikistan project report 2011. Description of objectives and results of Farmer-to-Farmer project completed in Tajikistan. Presented three times to different audiences in OSU and two times to civic organizations.

Deep fat frying workshop. 2006. Focus on operation and optimization of continuous deep fat frying equipment and products.

Biosystems & Ag Engineering Department Extension In-service. 2005, 2004, 2002. FAPC Overview.

Advanced director training workshop 2003. Using outside consultants. Presented to co-op managers at Autry Technology Center, Enid.

Stillwater Lions Club. 2002. Overview of the "Grassohol" project at OSU.

Applications Engineers Workshop. 2001. Selecting a temperature data logger and enclosure for your freezer, FAPC.

Master Canner's workshop, 2000 and 2001. Developing Process Flow Diagrams. FAPC.

Basic Training, approximately 12 occasions, 2000-2014. FAPC

HACCP workshop. 1999 (3 separate times), 1998 (2 times), 1997. Process flow diagramming, FAPC.

FDA Workshop. 1998. Design of small-scale food processing operations, workshop specifically set up for FDA employees, held at the FAPC.

Small Business Workshop. 1997. Process records and drawings, FAPC.

III. Grants

A. Overview

Total Grants: $5,590,143.

BAE Seed Grant to research waterless cleaning techniques for food processing systems, $6,000. PI, Bowser. Sponsored by Biosystems Engineering Department, 2024.

Energy Audit Program for Food & Ag (EAPFA) $100,000. PI's, Bowser (lead) and K.N. Patil. Sponsored by USDA REAP, September 2022 to September 2023.

Undergraduate Research Scholars Grant. $1,000. Lead PI, Bowser. Sponsored by OAES/Ferguson College of Ag. 2020.

Internship for development of healthy snacks. $47,600. Lead PI, Bowser. Sponsored by Oklahoma Center for the Advancement of Science and Technology and KiZE Concepts, LLC of Oklahoma City. July 2020 to July 2022

Pawnee Agriculture & Nutrition Initiative – Outreach. $70,000. Lead PI, P. Rayas. Sponsored by USDA NIFA EIRP Indian Res. Program 2018-2019.

Commercialization of a mini, cloud-enabled revelation roaster. $600,000. Lead PI, Bowser, Co-PIs: Ning Wang, Dan Jolliff. Sponsored by the Oklahoma Center for the Advancement of Science and Technology and US Roaster Corp. July 2017 to June2019.

Research and development of cocoa bean size reduction process, internship. $41,048. Lead PI, Bowser. Co-PI: Ning Wang. Sponsored by the Oklahoma Center for the Advancement of Science and Technology. January 2016 to December 2017.

Grape seed value-added products from Oklahoma winery waste. $49,978. Lead PI, Niels Maness. Co-PI: Tim Bowser. Sponsored by Oklahoma Dept. of Ag. September 2013 to September 2014

Improve and verify hand washing operations in food processing facilities and in the field. $47,750. Lead PI, Ning Wang. Co-PI's Bowser and Sheng. Sponsored by OSU

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Planning Grant for Establishing Creative Interdisciplinary Programs. July, 2013 to July 2014.

Advancement of a whole-chain, stakeholder driven traceability system for ag commodities, $543,000. Lead PI's, Brian Adam and Mike Buser, OSU. Sponsored by USDA-NIFSI. September 2011 to December 2014.

Soy pectin extraction technology development. $4,580. Lead PI's Tim Bowser and William McGlynn (subcontract under Phil Crandall, Arkansas State University). July 2011 to June 2012.

High efficiency coffee roaster development. $424,033, Lead PI's: Tim Bowser and Scott Frazier (OSU) and Dan Jolliff, Roasters Exchange Company. Sponsored by OCAST OARS program. October 2009 to September 2011.

Paddlefish caviar program feasibility study. $25,000, Lead PI: Dr. Gary Frankwick (OSU Spears School of Business). Sponsored by the Oklahoma Department of Wildlife. January to June, 2007.

Borate Coating Screening Study. $2,300. PI: Tim Bowser. Sponsored by CESI, Marlow, OK. July to October 2007.

Extraction Alternatives for Ag and Industrial Substrates. $29,000. PI's Niels Maness, Tim Bowser, and Patricia Klee (ATEP). Sponsored by OSU TBAG program. April 2007 to May 2008.

Economic feasibility of utilizing food processing FOG as biodiesel feedstock. $30,000. Co-PI's: Bowser, DeWitt, Holcomb, Maness, Nabors, Nelson, Roeber, Ryan and Weckler. Sponsored by the OSU TIP program. June 2006 to July 2007.

Low-cost, safe dehydrator for small and very small meat processors. PI's: Tim Bowser and Peter Muriana. $28,500. Sponsored by USDA FSIS 2005 Cooperative Grant. July 2005 to June 2006.

Low-cost, Clean-In-Place (CIP) unit for small and very small meat processors. P.I. Tim Bowser. $25,000. Sponsored by USDA FSIS 2005 Cooperative Grant. June 2006 to July 2007.

Bar-S Foods, Co. Economic Impact Study: Waste Gasification. PI's: Tim Bowser, Christina DeWitt and Paul Weckler. $4,750. Sponsored by Bar-S Foods. January to December, 2005.

Biomass-based Energy Research. $955,563. PI: Ray Huhnke; coPI's: Tim Bowser and others from OSU and Mississippi State University. Sponsored by USDA Special Research Grant 2004. July 2004 to June 2006.

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Biomass-based Energy Research. $897,947 (renewal). PI: Ray Huhnke; coPI's: Tim Bowser and others from OSU and Mississippi State University. Sponsored by USDA CSREES. July 2002 to June 2004.

Non-destructive methods for predicting beef tenderness. $40,000. PI: Glenn Kranzler. Co-PI's: Tim Bowser, Paul Weckler, Dori Sigfusson, and Brad Morgan. Sponsored by OSU FRIP. July 2002 to June 2003.

Production, development and marketing of value-added horticultural products. $1.8 million. ($162,016 OSU portion). OSU PI: Rodney Holcomb. Co-PI's Tim Bowser and William McGlynn. Cooperators included Mississippi State and Arkansas State. Sponsored by USDA 401 IFAFS 2001. July 2002 to June 2005.

Biomass-based Energy Research. $840,000. PI: Ray Huhnke; coPI's: Tim Bowser and others from OSU and Mississippi State University. Sponsored by USDA Special Research Grants Program 2001. July 2001 to June 2003.

Biofuel from hog-slaughter byproducts. $48,000. CoPI's: Tim Bowser, Paul Weckler, and Christina DeWitt. Sponsored by OSU FRIP 2001. July 2001 to June 2003.

Biomass research program. $100,000. PI: Ray Huhnke. Co-PI's: Tim Bowser and others from OSU and OU. Sponsored by the Williams Corp. July 2001 to June 2003.

Development and testing of capability to perform preference trials for pet food and animal feed formulations. $15,200. Co-PI's: Tim Bowser and Charles Abramson. Sponsored by OSU FRIP 2001. July 2001 to June 2002

Pesticide Alternatives for Food Processing Pest Management. $29,500. Co-PI's: Tim Bowser, Tom Phillips, and G. Cuperus. Sponsored by OSU FRIP 2000. July 2000 to June 2001.

Production of ethanol from low-cost biomass –a holistic approach. $75,000. PI: Bill Barfield. Co-PI's: Bowser and others from OSU. Sponsored by the Western Regional Biomass Energy Program. June 1999 to July 2001

QuickWater® and EconoWater® performance evaluation. $18,250. PI: Tim Bowser. Sponsored by Webco, Inc. December 1999 to December, 2001.

Development of beef broth and bone meal as flavor enhancers in pet foods. $26,000. Co-PI's: Tim Bowser, Charles Abramson and Lowell Satterlee. Sponsored by OSU FRIP. June

Concentration of food and agricultural products using super absorbent polymers. $11,200. Co-PI's: Tim Bowser, Rodney Holcomb, and Lowell Satterlee. Sponsored by OSU FRIP. June 1999 to July 2000.

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Development of moisture absorbent packaging for extended shelf life of cut melons. $8,800. Co-PI's: Tim Bowser and William McGlynn. Sponsored by OSU FRIP. June 1999 to July 2000.

Conversion of biomass to liquid fuel. $50,000. PI: Bill Barfield. Co-PI's: Tim Bowser and others from OSU. Sponsored by the OSU VP Research. June 1998 to July 1999.

Conversion of biomass to liquid fuel. $13,000. PI: Bill Barfield. Co-PI's: Tim Bowser and others from OSU. Sponsored by OSU, FAPC.

Application of a novel grinder for safer meats. $9,000. PI: Bowser. Co-PI's: Jerry Brusewitz, Glenn Dolezal, and Brad Morgan. Sponsored by OSU FRIP. March 1998 to May 1999.

Development and commercialization of Ready-to-Eat Foods for Exotic Pets. OCAST OARS Applied grant. $58,151. PI. Bowser. Co-PIs: Phil Kenkle, Charles Peterson and Raymond Huhnke. July 1998 to June 1999.

Development and evaluation of a shelf-stable, ready-to-eat food for box turtles (continuation). $11,590. Co-PI's: Tim Bowser, Phil Kenkel and Charles Peterson. Sponsored by OSU FRIP. March 1998 to December 1999.

Evaluation of the antimicrobial effectiveness of the QuickWater® water heater. $17,350. Co-PI's: Tim Bowser and Peter Muriana. Sponsored by Webco Industries, Inc. July 1998 to July 2000.

Development of an agglomeration and pelletizing process for extraction of ground sage. $18,500. Co-PI's: William McGlynn, Dani Bellmer and Tim Bowser. March 1997 to July 1998.

Development and evaluation of a shelf-stable, ready-to-eat food for box turtles. $33,037. Co-PI's: Tim Bowser, Phil Kenkel, and Charles Peterson. Sponsored by OSU FRIP. March 1997 to July 1998.

Wheat processing feasibility in Oklahoma. $30,000. Co-PI's: Tim Bowser, Phil Kenkel, Rodney Holcomb, and Dan Tilley. Sponsored by OSU FRIP. March 1997 to July 1998.

Development of a novel food grinder for safer meats. $45,500. PI: Tim Bowser. Co-PI's: Jerry Brusewitz, Glenn Dolezal. Sponsored by OSU FRIP. March 1997 to July 1998.

IV. Teaching

Teaching is an activity that finds its way into all of my professional work, even though I do not have an official appointment in this area.

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A. Graduate Student Advising

Ph.D. Students: Major Professor –7; Committee member –21; Total –28
M.S. Students: Major Professor –19; Committee member –34; Total –53
Current students: 0 Ph.D. and 2 M.S.

B. Graduate Classes Developed and Taught

Coffee Byproducts Reuse, 2022
Experiments in Mixing Technology, 2020,
International Food Engineering Practice, 2019, 2020
Consumer Sensory Testing Methods, 2019, 2020
Food Texture Modifications, 2018
Toasting of Food Products, 2018
Release Agents in Baking, 2016
Zero Waste in Food Manufacturing, 2015
Introduction to Food Process Engineering, 2014
Food Safety: Post Conflict Areas, 2013
Food Equipment Design, 2013
Dairy Processing and Technology, 2011
Carbon Strategy in the Food Industry, 2010
Mechanical Separation, 2009
CIP Cleaning Systems, 2009

C. Senior Design Projects

The Biosystems and Agricultural Engineering Department has a two-semester capstone senior design course. Student teams are paired with a sponsor company to discover and build practical solutions to real-life problems. I have participated as a team mentor on the following projects over a 14-year period:

- Cacao processing
- Coconut processing
- Coffee grinder
- Coffee, seed and grain roaster design (4 projects)
- Cold plasma treatment of pecans
- Composting toilet
- Conveyor design for X-Ray inspection
- Custom knock-box for animal slaughter
- Dehydrator for spices
- Dough dispensing (2 projects)
- Mushroom packing system
- Oil filtration and storage for food trucks
- Packaging for hand-held pies
- Paddle fish processing

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- Paddle fish waste utilization
- Pet treat sorting and handling
- Sausage patty inspection
- Water recovery in fertilizer processing

D. Honors Students

Wentz Foundation Scholars: Davie Joe Vadder, 1999 & Ben Smith, 2009
Freshman Scholars: Susan Weckler, 2016

E. Freshmen Projects

The Biosystems and Agricultural Engineering Department engages freshmen in a hands-on, applications class to introduce them to the department and faculty. I have participated by mentoring several student groups over a 15-year period.

F. Guest Lectures in Undergraduate Classes

Biomass Conversion –Biosystems Department; 2002, 2003
Clean in Place –Biosystems & Food Science Department; 2007, 2008, 2010, 2012, 2013, 2015, 2016
Continuous Improvement –Biosystems Department; 2005, 2006
Dairy Thermal Processing –2015, 2017, 2020, 2022
Facility Planning –Biosystems Department; 2004, 2005
Food Chemistry –Animal and Food Science Department; 2017-2021
Food Process Engineering –Food Science Department; 2010-2012, 2014-2023
Pump laboratory –Biosystems Department; 2006-2023
Worldwide food production –Veterinary Medicine Department; 2010-2023

V. International Activities

Kenya 2023. Beef processing for animal food, treats and chews.

Trinidad 2021. Facility design and equipment selection for a jerky processing facility. Work was accomplished via videoconference and email.

Nigeria 2020. Assisted two entrepreneurs from Nigeria with development of food processes for potato chips and Fonio Couscous. Assistance was provided virtually via email.

India 2018. Short term invited visit to lead the process design for a large-scale goat dairy project in Karnataka. Processes included facility design, cheese manufacturing, bottled milk, feed mill and feed storage. Sponsored by private agencies and NGOs.

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Nicaragua 2016. Short term invited visit to teach dehydration techniques for fruits, vegetables and meats, food safety and hygiene. Designed and built solar dehydrators in three locations using local materials and labor. Sponsored by USAID Farmer-to-Farmer program and organized by Partners of America.

Tanzania 2015 and 2014. Short term invited visits to the Lake Victoria region. The purpose was to assess potential for future food and agricultural programs, collect soil samples, network at local universities, and teach classes and give demonstrations on soil fertility, micro-irrigation, and water purification.

Bangladesh 2014. Developed flow diagrams, equipment list and price estimates for a dehydrated meal process for Golden Harvest, a food processing company located in Gazipur. Sponsored by USAID Farmer-to-Farmer program and organized by Winrock, International. A future site visit is expected.

Ethiopia: 2013. Short term (17 day) invited visit to evaluate meat processing practices in slaughter facilities in four regions of Ethiopia. Provided food safety and HACCP training and design information for new processing facilities, including a mobile abattoir. Sponsored by USAID and organized by CNFA.

Mozambique: 2013. Short term (17day) invited visit to train faculty and lecture students on food engineering and safety topics at the Catholic University of Mozambique (UCM), Chimoio. Sponsored by USAID Farmer-to-Farmer program and organized by CNFA.

Guatemala: 2013. Short term (7 day) mission trip to assist an NGO with ongoing operations, provide food safety educational materials, give recommendations for entrepreneurs working with food products.

Kenya: 2012. Short-term (18 day) invited visit to evaluate and make recommendations to improve processing at the Kenya Meat Commission a quasi-private meat processor in Kenya with locations in Nairobi and Mombasa. Volunteer assignment sponsored by USAID Farmer-to-Farmer program organized by CNFA.

Tajikistan: 2011. Short-term (16 day) invited visit to southeast Tajikistan to assist a food processor with equipment, process, sanitation, packaging, and facility issues. Volunteer assignment sponsored by USAID Farmer-to-Farmer program and organized by CNFA.

Mongolia: 2009, 2010. Short-term (three week) invited visit to central Mongolia in 2009 to co-teach a short course on food processing at the Mongolia International University. Taught food safety, microbiology, HACCP, food processing and facility design. Taught the same class in 2010 via pre-taped lectures. The lectures and associated materials were sent via a colleague.

India: 2009. Short-term (10-day) visit to the Indian Institute of Crop Processing Technology (IICPT) in Tamil Nadu to make two invited presentations at the inauguration

of a new value-added food processing center. In 2011, a Memorandum of Understanding has been signed between OSU and IICPT.

Ukraine: 2007, 2008. Two short-term (five weeks total) invited visits to eastern Ukraine. Worked with local farmers and assisted with youth training development. Developed and submitted proposals for value-added agricultural processing and youth education.

Croatia: 2005, 2006. Two short-term (three weeks each) invited visits. Worked with local farmers in southern Croatia and Bosnia. Taught classes and workshops on: cheese production, value-added processing, milk quality, fish processing, facility design, sanitation, HACCP, and process optimization.

Israel: 2004. Oklahoma-Israeli Agricultural Exchange Tour. Three-week tour of Israel covering food and ag processors and academic institutions.

VI. Other

A. Memberships and Connections

3-A Sanitary Standards, Inc.; American Society of Agricultural and Biological Engineers (ASABE); Institute of Food Technologists (IFT); Gamma Sigma Delta, Ag Honor Society, Oklahoma State University, Treasurer; Tau Beta Pi, Engineering Honor Society, Alpha chapter, University of Tennessee; Editorial Advisory Board of The Open Food Science Journal, Bentham Science Publishers, Oak Park, Illinois

B. Professional Service

- Biosystems & Ag Engineering Extension Group, 202-Pres.
- Biosystems & Ag Engineering RPT&CR Committee Chair, 2021-2022
- Biosystems & Ag Engineering, Space and Safety Committee, 2022-Pres.
- Advisory Committee Member, ShelfLifeAdvice.com, 2009 to 2020
- DASNR RPT&SG Committee Member, 2017 to 2020
- Ag Faculty Council Committee Member, 2015, 2016, 2017
- Committee on Sanitary Standards, 3-A Sanitary Standards, Inc., 2011 to 2012
- Faculty Council Budget Committee, 2011 to 2013
- Member of ASABE FPE-707 Committee, 1998 to 2019
- Oklahoma section of the ASABE: Chair, 2003, Vice Chair 2002, Secretary 2001, Treasurer, 2000, Local Arrangements, 1999 and 1998
- Faculty Advisor, Beta Upsilon Chi (BYX) student fraternity, 2008 to 2018
- Faculty Advisor, ASABE Student Branch, 2000, 2008 to 2010
- Faculty Advisor, Food Science Club, 2007 to 2008
- Secretary for Gamma Sigma Delta 2005

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C. Honors

Nominated for the 2015 National Excellence in Extension Award and Diversity Award; Oklahoma Regents Business Partnership Excellence Award, 2012-2015, 2014 Outstanding Individual Program Award –Outreach and Education; 2014 Global Citizen Faculty Award; 2012 BYX (men's fraternity) Service Award; First place award in 2008 global white paper contest for "Major Process Improvement Opportunities in the Food Industry" sponsored by Nine Sigma. Food Engineering's 1999 Plant of the Year Award for an aseptic pudding plant design. USDA National Needs Fellowship; Tau Beta Pi Engineering Honor Society; Gamma Sigma Delta, Ag Honor Society; Technical on-call member, Gerber crisis preparedness team; Presidential fitness award; Distinguished Graduate U.S. Army Combat Engineer School, Fort Leonard Wood, MO.

D. Community Service

First Alert Team (safety and security), UHBC, Stillwater, Member 2018 to pres., chair, 2020; Our Daily Bread Food & Resource Center, Stillwater, monthly volunteer, 2017 to 2020; The Coffee House, Stillwater's nonprofit coffee shop, board of directors, 2015 to 2020; Instructor for young adult classes at UHBC, 2009 to present; Assistant Scoutmaster and Troop Committee member, Boy Scout Troop 420, 2007 to 2016; Assistant Cub Master and Den Leader 1998 to 2001; Cub Scout den leader 2003 to 2007; Chairman, Kitchen Committee, UHBC, 1999 to 2003; Instructor for 1st to 5th graders at UHBC, 2000 to 2008.