

## Curriculum Vitae

Notarization. I have read the following and certify that this *curriculum vitae* is a current and accurate statement of my professional record.



Signature \_\_\_\_\_ Date September 18, 2015

### **I. Personal Information**

#### **I.A. Contact Information**

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#### **I.B. Academic Appointments at UMD**

Robert Facchina Professor of Food Safety, Department of Nutrition and Food Science,  
July, 2008 to Present

#### **I.C. Administrative Appointments at UMD**

Director, Center for Food Safety and Security Systems

#### **I.D. Other Employment**

- 1999 - 2008. Senior Science Advisor, US Food and Drug Administration, Center for Food Safety and Applied Nutrition, Senior Biomedical Research Service, College Park, MD.
- 1999 – 2006. Director, FDA/CFSAN Office of Science. 1999 – 2006. Director, CFSAN Office of Science, College Park, MD.
- 1998 - 1999. Lead Scientist for President's Food Safety Initiative, US Food and Drug Administration, Center for Food Safety and Applied Nutrition, Senior Biomedical Research Service, Washington, DC.
- 1995 - 1998. Research Microbiologist, USDA, ARS, ERRC, Wyndmoor, PA.
- 1994 - 1995. Deputy Administrator, USDA, FSIS, S&T, Washington, DC.
- 1982 - 1994. Supervisory Microbiologist, USDA, ARS, ERRC, Philadelphia, PA. Research Leader of Microbiological Safety Research Unit.
- 1975 - 1982. Assistant/Associate Professor (tenured), Drexel University, Dept. Nutrition & Food Sciences, Philadelphia, PA.

#### **I.E. Educational Background**

- 1964 - 1969. Rutgers University, Food Science, B.S.
- 1969 - 1971. Rutgers University, Food Science, M.S.

- 1971 - 1972. Rutgers University, Food Science, M.Phil.
- 1972 - 1974. Rutgers University, Food Science, Ph.D.
- 1974 - 1975. University of Georgia, Food Science, Post-Doctoral Training (Food Science / Mycotoxicology)

## II. Research, Scholarly and Creative Activities

### II.A. Books

#### II.A.2. Books Edited

1. Buchanan, R.L.\*, Palumbo, S. A., and Whiting, R. C., eds. "Proceeding of the Workshop on the Applications of Predictive Microbiology and Computer Modeling Techniques to the Food Industry." J. Indus. Microbiol. 12:137-138. 1993.
2. Buchanan, R.L., Sheridan, J. J., and Montville, T. J., eds. Special Issue on HACCP: An Integrated Approach to Assuring Microbiological Safety. J. Food Safety 15:91-199. 1995.
3. Sheridan, J. J., Buchanan, R.L., and Montville, T. J., eds. Integrated Approach to Assuring Microbiological Safety of Meat and Poultry. Food and Nutrition Press. Trumbull, Conn. 1996.
4. Doyle, M.P. and R.L. Buchanan, eds. "Food Microbiology: Fundamentals and Frontiers, 4<sup>th</sup> edition." ASM Press, Washington DC. 2013.

#### II.A.5. Major Reference Works

Contributor and member of editorial committee for series of reference books written by the International Commission on Microbiological Specification for Foods (ICMSF)

- Microorganisms in Foods 5: Characteristics of Microbial Pathogens. ISBN: 041247350X. London: Blackie Academic & Professional. London. 1996.
- Microorganisms in Foods 6: Microbial Ecology of Food Commodities, 1<sup>st</sup> edition. Chapman Hall. New York. 1996.
- Microorganisms in Foods 6: Microbial Ecology of Food Commodities, 2<sup>nd</sup> edition. ISBN: 0-306-48675-X, Kluwer Academic/Plenum Publishers. New York. 2005
- Microorganisms in Foods 7: Microbiological Testing in Food Safety Management. ISBN: 0306472627. Kluwer Academic Plenum Publishers. New York. 2002.
- Microorganisms in Foods 8: Use of Data for Assessing Process Control and Product Acceptance. ISBN 978-1-4419-9373-1. Springer Publishers. 2011.

### II.B. Book Chapters

- Buchanan, R. L.\* Food Fermentations with Molds. In "Biotechnology in Food Processing." S. K. Harlander and T. P. Labuza, eds., Noyes Pub., Park Ridge, NJ, pp. 209-222. 1986.
- Buchanan, R. L.\* and Bennett, J. W. Nitrogen regulation of polyketide mycotoxin production. In "Nitrogen Source Control of Microbial Processes," S. Sanchez-Esquivel, ed. CRC Press, Inc. Boca Raton, FL. pp137-149. 1988.
- Buchanan, R. L. Advances in cultural methods for the detection of *Listeria monocytogenes*. In "Foodborne Listeriosis," A. J. Miller, J. L. Smith, and G. A. Somkuti, eds. Soc. Indus. Microbiol. pp. 85-95. 1990.
- Smith, J. L.\* and Buchanan, R. L. Shigella. in "Compendium of Methods for the Microbiological Examination of Foods", 3rd ed. C. Vanderzant and D. F. Splitstoesser, eds. Amer. Pub. Health Assoc. 1992. pp423-431.

- Buchanan, R. L. Predictive microbiology: Mathematical modeling of microbial growth in foods. in "Food Safety Assessment" J. W. Finley, S. F. Robinson, D. J. Armstrong (eds.). ACS Symposium Series 484, American Chemical Society. Washington, D.C. pp250-260. 1992.
- Buchanan, R. L.\*, Acuff, G. R., and Halbrook, B. Data needed to develop microbial food safety systems for slaughter, processing and distribution. In "Tracking Foodborne Pathogens from Farm to Table: Data Needs to Evaluate Control Options." USDA Economic Research Service. Misc. Pub. No. 1532. pp71-80.
- Whiting, R. C.\* and Buchanan, R. L. Predictive Modeling. in "Food Microbiology, Fundamentals and Frontiers." M. P. Doyle, L. R. Beuchat, and T. J. Montville, ed. ASM Press. Washington, D.C. pp728-739. 1997.
- Buchanan, R. L.\*, Whiting, R.C., and Golden, M. H. R. C. Modeling acid inactivation of foodborne microorganisms in "Control of Foodborne Microorganisms. Juneja, V. K. and J. N. Sofos, ed. Marcel Dekker, Inc. New York. pp. 461-477. 2001.
- Whiting, R. C.\* and Buchanan, R. L. Predictive modeling and risk assessment. In "Food Microbiology, Fundamentals and Frontiers, 2<sup>nd</sup> ed." M. P. Doyle, L. R. Beuchat, and T. J. Montville, ed. ASM Press. pp813-831. 2001.
- Fratimico, P. M.\*, Smith, J. L., and Buchanan, R. L. *Escherichia coli*. In "Foodborne Diseases, 2<sup>nd</sup> ed." Elsevier Science Ltd. Pp. 79-101. 2002.
- Buchanan, R. L.\* and Suhre, B. New developments in chemical and microbial risk assessment. in "Toward Safer Food: Perspectives on Risk and Priority Setting," S. A. Hoffman and M. R. Taylor, ed. Resources for the Future, Washington, D.C. 2005. pp161-179 (Book Chapter)
- Buchanan, R. L. Uses and Limits of Microbial Testing, in "Advances in Microbial Food Safety," Juneja, V.K., Cherry, J.P., and Tunick, M.H. (eds). American Chemical Society, Washington, D.C. pp184-204. 2006.
- Whiting, R.L.\* and Buchanan, R.L. Using risk assessment principles in an emerging paradigm for controlling the microbial safety of foods. In "Microbial Risk Analysis of Foods." D.W. Schaffner, ed. ASM Press. Washington, DC. pp29-50. 2007.
- Whiting, R.C.\* and Buchanan, R.L. Progress in microbiological modeling and risk assessment. In "Food Microbiology: Fundamentals and Frontiers, 3<sup>rd</sup> ed. ASM Press, Washington DC. Pp953-969. 2007.
- Dennis, S.H., Kause, J., Losikoff, M., Engeljohn, K.L., and Buchanan, R.L. Using risk analysis for microbial food safety regulatory decision making. In "Microbial Risk Analysis of Foods." D.W. Schaffner, ed. ASM Press. Washington, DC. Pp137-176. 2008.
- Buchanan, R.L. Risk assessment methods. In "Foodborne Diseases and Public Health: Summary of an Iranian-American Workshop." C.W. Sutor and M. Oria, rapporteurs. National Research Council and Institute of Medicine. National Academies Press. Washington, DC. pp37-41. 2008.
- Miliotis, M.D.\* and Buchanan, R.L. Microbial risk assessment. In N. Heredia, I. Wesley, and S. Garcia (eds). "Microbiologically Safe Foods. J. Wiley and Sons, Inc., Hoboken, NJ. pp. 379-394. 2009.
- Buchanan, R.L. Changing face of quantitative microbial risk assessment. In "Risk Assessment of Foods." C.-H. Lee, ed. KAST Press. pp139-148. 2010 (In Korean).
- Buchanan, R.L. Bridging consumers' right to know and food safety regulations based on

- risk assessment. C.-H. Lee, ed. KAST Press. pp225-234. 2010. (In Korean)
- Buchanan, R.L. Moving from hazard-based to risk-based microbial food safety systems to promote public health and foster fair trade practices. In —Emerging and Persistent Infectious Diseases: Focus on Prevention. Institute on Science for Global Policy. Tucson, AZ. pp61-72. 2011.
  - Sharma, M.,\* Y. Luo, and R. Buchanan. Microbial safety of tropical and subtropical fruits. In E.M. Yahia (ed) “Postharvest Biology and Technology of Tropical and Subtropical Fruits, Vol 1.” Woodhead Publishing. Philadelphia. Pp288-314. 2011.
  - Ryser, E.T. and R.L. Buchanan. *Listeria monocytogenes*. In Doyle, M.P. and R.L. Buchanan, eds. “Food Microbiology: Fundamentals and Frontiers, 4<sup>th</sup> edition.” ASM Press, Washington DC. 2013.
  - Buchanan, R.L and E.N. Williams.# Hazard analysis and critical control point system: Use in managing microbiological food safety risks. In Doyle, M.P. and R.L. Buchanan, eds. “Food Microbiology: Fundamentals and Frontiers, 4<sup>th</sup> edition.” ASM Press, Washington DC. 2013.
  - Ruzante, J.M., R.C. Whiting, S.B. Dennis, and R.L. Buchanan. Microbial Risk Assessment. In Doyle, M.P. and R.L. Buchanan, eds. “Food Microbiology: Fundamentals and Frontiers, 4<sup>th</sup> edition.” ASM Press, Washington DC. 2013.

#### II.C. Articles in Refereed Journals

- Buchanan, R. L. and Solberg, M.\* Interaction of sodium nitrite, oxygen, and pH on growth of *Staphylococcus aureus*. J. Food Sci. 37:81-85. 1972.
- Buchanan, R. L.\* and Ayres, J. C. Effect of initial pH on aflatoxin production. Appl. Microbiol. 30:1050-1051. 1975.
- Buchanan, R. L.\* and Ayres, J. C. Effect of sodium acetate on growth and aflatoxin production by *Aspergillus parasiticus* NRRL 2999. J. Food Sci. 41:128-132. 1976.
- Solberg, M.\*, Miskimin, D. K., Kramer, R., Riha, W. E., Jr., Franke, W. C., Buchanan, R. L. and O’Leary, V. O. Assurance of microbiological safety in a university feeding system. J. Milk Food Technol. 39:200-203. 1976.
- Miskimin, D. K., Berkowitz, K. A., Solberg, M.\*, Rhea, W. E., Jr., Franke, W. C., Buchanan, R. L. and O’Leary, V. Relationships between indicator organisms and specific pathogens in potentially hazardous foods. J. Food Sci. 41:1001-1006. 1976.
- Buchanan, R. L.\* and Ayres, J. C. Effect of various glycolytic and TCA cycle intermediates on aflatoxin production. J. Food Safety. 1:19-28. 1977.
- Buchanan, R. L.\* and Fletcher, A. M.# Methylxanthine inhibition of aflatoxin production. J. Food Sci. 43:654-655. 1978.
- Buchanan, R. L.\* and Solberg, M. Influence of sodium nitrite on the aerobic catabolism of glucose by *Staphylococcus aureus*. J. Food Safety. 1:211-215. 1978.
- Buchanan, R. L.,\* Applebaum, R. S.# and Conway, P.# Effect of theobromine on growth and aflatoxin production by *Aspergillus parasiticus*. J. Food Safety. 1:211-215. 1978.
- Applebaum, R. S.# and Buchanan, R. L.\* Intracellular concentration of cAMP and cGMP in an aflatoxigenic strain of *Aspergillus parasiticus*. J. Food Safety. 44:116-117. 1979.
- Nartowicz, V.,# Buchanan, R. L.\* and Seagall, S. Aflatoxin production in regular and decaffeinated coffee beans. J. Food Sci. 44:446-448. 1979.
- Buchanan, R. L.\* Toxicity of spices containing methylenedioxybenzene derivatives: A

review. J. Food Safety. 1:275-293.

- Abdollahi, A.# and Buchanan, R. L.\* Regulation of aflatoxin biosynthesis: Characterization of glucose as an apparent inducer of aflatoxin production. J. Food Sci. 46:143-146. 1981.
- Abdollahi, A.# and Buchanan, R. L.\* Regulation of aflatoxin biosynthesis: Induction of aflatoxin production by various carbohydrates. J. Food Sci. 46:633-635. 1981.
- Bullerman, L. B. and Buchanan, R. L. Mycotoxins other than aflatoxins—their relationships to food safety: Introduction. J. Food Protection. 44:701, 710. 1981.
- Buchanan, R. L.\* and Shepherd, A. J.# Inhibition of *Aspergillus parasiticus* by thymol. J. Food Sci. 46:976-977. 1982.
- Buchanan, R. L.\*, Goldstein, S.# and Budroe, J. D.# Examination of chili pepper and nutmeg oleoresins using the *Salmonella*/mammalian microsome mutagenicity assay. J. Food Sci. 47:330-331, 333. 1982.
- Tice, G.# and Buchanan, R. L.\* Regulation of aflatoxin biosynthesis: Effect of exogenously supplied cyclic nucleotides. J. Food Sci. 47:153-157. 1982.
- Buchanan, R. L.\*, Tice, G.# and Marino, D.# Caffeine inhibition of ochratoxin A production. J. Food Sci. 47:319-321. 1982.
- Buchanan, R. L.\* Inherent safety of cheese and meat fermentations: A review of some toxicological considerations. J. Food Safety. 4:125-137. 1982.
- Buchanan, R. L.\* and Houston, W. M.# Production of blue-fluorescent pyrazines by *Aspergillus parasiticus*. J. Food Sci. 47:779-782. 1982.
- Miller, A. J.\*# and Buchanan, R. L. Detection of genotoxicity in fried bacon by the *Salmonella*/mammalian microsome mutagenicity assay. Food Chem. Toxicol. 21:319-323. 1983.
- Buchanan, R. L.\*, Harry, M. A.# and Gealt, M. A. Caffeine inhibition of sterigmatocystin, citrinin, and patulin production. J. Food Sci. 48:1226-1228. 1983.
- Smith, J. L.\*, Buchanan, R. L. and Palumbo, S. A. Effect of food environment on staphylococcal enterotoxin synthesis. J. Food Prot. 46:545-555. 1983. (Review)
- Miller, A. J.\*# and Buchanan, R. L. Reduction of mutagen formation in cooked nitrite-free bacon by selected cooking treatments. J. Food Sci. 48:1772-1775. 1983.
- Buchanan, R. L.\*, Hoover, D. G. and Jones, S. B. Caffeine inhibition of aflatoxin production: Mode of action. Appl. Environ. Microbiol. 46:1193-1200. 1983.
- Buchanan, R. L.\* and Lewis, D. F.# Caffeine inhibition of aflatoxin synthesis: Probable site of action. Appl. Environ. Microbiol. 47:1216-1220. 1984.
- Smith, J. L.\*, Benedict, R. C., Buchanan, R. L., Kalinowsky, S. and Palumbo, S. A. pH dependent acetate injury in *Staphylococcus aureus*: Role of temperature. Lebensmittel Wissenschaft Technologie. 17:271-275. 1984.
- Smith, J. L.\*, Bencivengo, M. M. and Buchanan, R. L. Enterotoxin biosynthesis by heat injured-repaired cells of *Staphylococcus aureus*. J. Food Safety. 6:203-209. 1984.
- Buchanan, R. L.\* and Lewis, D. F.# Regulation of aflatoxin biosynthesis: Effect of glucose on the activities of various glycolytic enzymes. Appl. Environ. Microbiol. 48:306-310. 1984.
- Buchanan, R. L.\* The "new" pathogens: An update of selected examples. Assoc. Food Drug Off. Quart. Bull. 48:42-155. 1984. (Review)
- Buchanan, R. L.\* and Stahl, H. G. Ability of various carbon sources to induce and

- support aflatoxin synthesis by *Aspergillus parasiticus*. J. Food Safety. 6:271-274. 1984.
- Buchanan, R. L.,\* Federowicz, D. and Stahl, H. G. Activities of tricarboxylic acid cycle enzymes in an aflatoxigenic strain of *Aspergillus parasiticus* after a peptone to glucose carbon source shift. Trans. Brit. Mycol. Soc. 84:267-275. 1984.
  - Buchanan, R. L.\* and Palumbo, S. A. *Aeromonas hydrophila* and *Aeromonas sobria* as potential food poisoning species: A review. J. Food Safety. 7:15-29. 1984.
  - Palumbo, S. A.,\* Morgan, D. R. and Buchanan, R. L. The influence temperature, NaCl and pH on the growth of *Aeromonas hydrophila*. J. Food Sci. 50:1417-1421. 1985.
  - Palumbo, S. A.,\* Maxino, F., Williams, A. C., Buchanan, R. L. and Thayer, D. W. Starch ampicillin agar for the quantitative detection of *Aeromonas hydrophila* in foods. Appl. Environ. Microbiol. 50:1027-1030. 1985.
  - Buchanan, R. L.,\* Ocker, L. A.# and Stahl, H. G. Effects of 2-deoxyglucose, alpha-methylglucoside, and glucosamine on aflatoxin production by *Aspergillus parasiticus*. Arch. Microbiol. 142:200-203. 1985.
  - Smith, J. L.,# Bencivengo, M. M., Buchanan, R. L. and Kunsch, C. A. Enterotoxin A production in *Staphylococcus aureus*: Inhibition by glucose. Arch. Microbiol. 144:131-136. 1986.
  - Palumbo, S. A.,\* Jenkins, R. K., Buchanan, R. L. and Thayer, D. W. Irradiation D-values for *Aeromonas hydrophila*. J. Food Prot. 49:189-191. 1986.
  - Huhtanen, C. N.,\* Shieh, J., Wierbicki, E., Zaika, L. L., Jenkins, R. K., Buchanan, R. L. and Thayer, D. W. Effect of sugar and low-dose irradiation on toxin production by *Clostridium botulinum* in comminuted bacon. J. Food Prot. 49:112-116. 1986.
  - Buchanan, R. L.\* Processed meats as a microbiological environment. Food Technol. 40:134-138. 1986.
  - Buchanan, R. L.,\* Stahl, H. G., Ocker, L. A.,# Kunsch, C. A.# and Purcell, C. J., Jr.# Thioglycerol inhibition of growth and aflatoxin production in *Aspergillus parasiticus*. J. Gen. Microbiol. 132:2767-2773. 1986.
  - Dymicky, M.,\* Bencivengo, M. M., Buchanan, R. L. and Smith, J.L. Inhibition of *Clostridium botulinum* 62A by fumarates and maleates and relationship of activity to some physiochemical characteristics. Appl. Environ. Microbiol. 53:110-113. 1987.
  - Buchanan, R. L.\*, Wiseman, D. W., Ocker, L. A.,# Stahl, H. G., Kunsch, C. A.# and Purcell, C. J., Jr.# The effects of  $\beta$ -methylglucose, 3-O-methylglucose and thioglucose on aflatoxin production by *Aspergillus parasiticus*. J. Food Safety. 8:127-138. 1987.
  - Smith, J. L.,\* Bencivengo, M. M., Buchanan, R. L. and Kunsch, C. A. Effect of glucose analogs on the synthesis of staphylococcal enterotoxin A. J. Food Safety. 8:139-147. 1987.
  - Buchanan, R. L.,\* Zaika, L. L., Kunsch, C. A.,# Purcell, C. J., Jr.# and Mertz, S. E.# Isolation of a caffeine-resistant mutant of *Aspergillus parasiticus*. J. Food Sci. 52:194-196. 1987.
  - Thayer, D. W.,\* Muller, W. S., Buchanan, R. L. and Phillips, J. G. Effect of NaCl, pH, temperature, and atmosphere on growth of *Salmonella typhimurium* in glucose-mineral salts medium. Appl. Environ. Microbiol. 53:1311-1315. 1987.
  - Buchanan, R. L.,\* Jones, S.B., Gerasimowicz, W. V., Zaika, L. L., Stahl, H. G. and Ocker, L. A.# Regulation of aflatoxin biosynthesis: Assessment of the role of cellular energy status as a regulator of the induction of aflatoxin production. Appl Environ.

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- Palumbo, S. A.,\* Williams, A. C., Buchanan, R. L. and Phillips, J. G. Thermal resistance of *Aeromonas hydrophila*. J. Food Protection. 50:761-764. 1987.
- Wiseman, D. E.# and Buchanan, R. L.\* Determination of glucose level needed to induce aflatoxin production in *Aspergillus parasiticus*. Can. J. Microbiol., 33:828-830. 1987.
- Zaika, L. L.\* and Buchanan, R. L. Review of compounds affecting the biosynthesis or bioregulation of aflatoxin. J. Food Protection. 50:691-708. 1987. (Review)
- Buchanan, R. L.,\* Jones, S. B. and Stahl, H. G. Effect of micronazole on growth and aflatoxin production by *Aspergillus parasiticus*. Mycopathologia. 100:135-144. 1987.
- Buchanan, R. L.,\* Smith, J. L., Stahl, H. G. and Archer, D. L.# *Listeria* methods development research at the USDA Eastern Regional Research Center. J. Assoc. Off. Anal. Chem. 71:651-654. 1988.
- Buchanan, R. L.,\* Stahl, H. G. and Archer, D. L.# Improved plating media for simplified, quantitative detection of *Listeria monocytogenes* in foods. Food Microbiol. 4:269-275. 1987.
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- Buchanan, R. L.\* and Bencivengo, M. M. Comparison of lethality in mouse versus goldfish for clinical and food isolates of *Aeromonas hydrophila*. J. Indus. Microbiol. 4:189-194. 1988.
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- Buchanan, R. L.,\* Stahl, H. G., Bencivengo, M. M., and Del Corral, F.# Comparison of lithium chloride-phenylethanol-moxalactam and modified Vogel Johnson agars for the detection of *Listeria* in retail-level meats, poultry and seafood. Appl. Environ. Microbiol. 55:599-603. 1989.
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recovery of *Listeria monocytogenes* on modified Vogel Johnson agar. J. Food Safety 10:155-163. 1990.

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## II.D. Published Conference Proceedings

### II.D.1. Refereed Conference Proceedings

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- Buchanan, R.L.\* How Does the U.S. Food Safety System Work and What Information Do Risk Managers Need? Proc. Conf. Priority Setting Foodborne Zoonotic Diseases. 2006.
- Buchanan, R.L.\* Food safety challenges facing the pet food industry. Proc. Waltham Internat. Nutritional Sci. Symp. 2010.
- Buchanan, R.L. Risk Perception: A challenge to the development of risk-based food safety policy. Conf. Food Safety, Security, and Defense (FSSD): Safeguarding the American Food Supply. Instit. Sci. Global Policy. 2015.
- Ruan, L. and R.L. Buchanan\*. Modeling the enhanced thermal inactivation of *Cronobacter sakazakii* by inclusion of "parabens." Prodecia Food Science (Accepted for

publication)

- Wang, Y. and R.L. Buchanan\*. Developing mechanistic models of transition periods between lag/exponential and exponential/stationary phases. *Procedia Food Science* (Accepted for publication).

#### II.E. Conferences, Workshops, and Talks

II.E.2. Over the course of the last 20 years I have given a large number of invited presentations and keynote addresses (2 to 3 per month) for which written abstracts were not required and for which I did not keep detailed records. Recent examples can be provided.

II.E.4. Published Refereed Abstracts of Presentations and Posters. Abstracts designated with ★ are invited presentations.

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- Edelson-Mammel, S. G. and Buchanan, R. L. Long term survival of *Enterobacter sakazakii* in powdered infant formula. Annual Meeting Internat. Assoc. Food Protection. 2004.
- Edelson-Mammel, S. G. and Buchanan, R. L. The acid resistance of 12 of *Enterobacter sakazakii*. Annual Meeting Internat. Assoc. Food Protection. 2004.
- Buchanan, R. L., Whiting, R. C., and Dennis, S. Assessing the risk associated with *Listeria monocytogenes*: U.S. and FAO/WHO Risk Assessments. Annual Meeting University of Georgia Center for Food Safety. 2004. ★
- Buchanan, R. L. Issues and Approaches for Considering Sensitive Subpopulations within Microbiological Risk Assessment. Annual Meeting Internat. Assoc. Food Protection. 2004. ★
- Buchanan, R. L. Moving Food Safety Concepts into the 21st Century: Learning to describe, manage, and even enjoy biological variability. Annual Meeting Amer. Chem. Soc. 2004. ★
- Buchanan, R. L. Interactions between risk management and risk assessment. World Congr. Food Infections Intoxications. 2004. ★
- Buchanan, R.L. International trade and microbiological food safety: Developments in WTO/SPS and Codex. Annual ICMSF Symposium. 2004 ★
- Buchanan, R. L. Linking microbiological criteria to public health goals. Annual Meeting University of Georgia Center for Food Safety. 2005. ★
- Buchanan, R. L. Sampling: The rate-limiting challenge for the testing of foods and water for foodborne bio-threat agents. National Conf Sampling Bio-threat Agents. 2005. ★
- Buchanan, R. L. Identification of vulnerabilities and risk assessment. Ann. Meeting Institute of Food Technologists. 2005. ★
- Buchanan, R.L., Whiting, R.C., Miliotis, M.D., and Long, W.R. Data utility approaches in food safety microbiological risk assessments and risk management. Ann Meeting Soc. Risk Analysis. 2005. ★
- Edelson-Mammel, S. G. and Robert L. Buchanan, R. L. Prior exposure to an acidic environment increases the acid resistance of *Enterobacter sakazakii*. Ann. Meeting Internat. Assoc. Food Protection. 2005.
- Buchanan, R. L. Linking public health goals to food hygiene requirements: Impact of risk analysis. COST Action 920 Food Zoonosis Work Group 3: Quantitative Risk Assessment. 2005. ★
- Buchanan, R. L. Introduction to the Codex risk management framework for relating food safety control measures to public health goals. ICMSF Conf on Linking Food Safety to Public Health Goals. 2005. ★
- Buchanan, R. L. Quantitative Microbiological Risk Assessment: From Dream to Reality in 15 Years. Ann. Meeting Soc. Risk Anal. 2005. ★
- Miliotis, M., Bowers, J., Walderhaug, M., DePaola, A., Dennis, S., and Buchanan, R. Evaluation of the Public Health Impact of *Vibrio parahaemolyticus* in Raw Oysters. Ann. Meeting Soc. Risk Anal. 2005.
- Buchanan, R.L. Federal food regulatory agency laboratory capability. Ann. Meeting Internat. Assoc. Food Protection. 2005. ★

- Buchanan, R.L. and Ross, T. Risk ranking: Priority setting in a complex world with finite resources. Internat. Life Sci. Instit. Meeting Microbial Risk Assessment. 2005. ★
- Edelson-Mammel, S.G., Whiting, R.C., Joseph, S.W., and Buchanan, R.L. Effects and Interactions of pH and Water Activity (aw) on the Thermal Resistance of *Listeria* ★ Internat. Assoc. Food Protection. 2006.
- Buchanan, R.L. Food defense: A different way of thinking. WFSS Food Defense Symposium. 2006. ★
- Buchanan, R. L. How does the U.S. food safety system work and what information do risk managers need? Proc. Priority Setting Foodborne Zoonotic Pathogens Conf. 2006. ★
- Buchanan, R.L. Food Defense: A different way of thinking. ECR-Consumer Goods Council South Africa Conf. 2006. ★
- Buchanan, R.L. Emerging Risk Management Tools. ICMSF Symp. South Africa: Symp. on Current and Innovative Approaches to Microbiological Food Safety Management. 2006. ★
- Buchanan, R.L. Scientific risk policy issues surrounding *Listeria monocytogenes*. Ann Meeting U. Georgia Center for Food Safety. 2006. ★
- Militotis, M., Dennis, S., Buchanan, R. and Potter, M. The role of epidemiology in microbial risk assessment. 10th UNJR Internat. Symp. Toxic Microorganisms. 2006.
- Buchanan, R.L. International aspects of produce safety. Ann. Meeting U. Georgia Center for Food Safety. 2007. ★
- Buchanan, R.L. What are the different types of risk assessments? Latin Amer. Congr. Food Microbiol. 2007. ★
- Buchanan, R.L. How do to a microbiological risk assessment? The FAO/WHO *Listeria monocytogenes* example. Latin Amer. Congr. Food Microbiol. 2007. ★
- Gendel, S., Buchanan, R., Dennis, S., Whiting, R., Bunning, V., Sheehan, J., Murray, C., Yanik, E., Farber, J., Smith, J., and Couture, H. A joint FDA/Health Canada public health risk assessment: *Listeria monocytogenes* in soft-ripened cheese. Internat. Symp. Problems Listeriosis. 2007.
- Militotis, M., Dennis, S., Hicks, J., and Buchanan R. Developing risk profiles to assist regulatory decision making. Ann. Meeting Internat. Assoc. Food Protection. 2007.
- Buchanan, R.L. The use of risk profiles by the Codex Alimentarius Committee on Food Hygiene. Ann. Meeting Soc. Risk Analysis. 2007. ★
- Dennis, S.B. and Buchanan, R. L. FDA/CFSAN's perspective: The use of quantitative risk assessment in decision-making. Ann. Meeting Soc. Risk Analysis. 2007. ★
- Buchanan, R.L. Emerging risk management tools. ICMSF Symposium. 2007. ★
- Buchanan, R.L. and Whiting, R.C. International microbiological criteria for foods: The emergence of risk-based standards and related metrics. UGA Center for Food Safety Annual Meeting. 2008. ★
- Buchanan, R.L. Emergence of produce as a vehicle for foodborne disease. New York Acad. Sci. Meeting Food Safety. 2008. ★
- Buchanan, R.L. FDA food defense and agro-terrorism programs: Being vigilant and prepared. Amer. Chem. Soc. Annual Meeting. 2008. ★
- Buchanan, R.L. Emerging risk management tools. Conf. Current Innovative Approaches in Microbiological Food Safety Management. 2008. ★

- Buchanan, R.L. How Will the Ability to Relate Food Safety System Stringency to Public Health Outcomes Change HACCP? UGA Center for Food Safety Annual Meeting. 2009. ★
- Buchanan, R.L. Risk-based food and water safety decisions: The fundamental challenge. Internat. Life Sci. Instit. Annul Meeting. 2009. ★
- Buchanan, R.L. Food protection in a global marketplace: The need for advanced technologies to make it simple. Gov. Univ. Ind. Res. Roundtable. 2009. ★
- Buchanan, R.L. Enlisting the help of academia in developing and translating food safety risk assessment in practical risk management programs. Soc. Risk Analysis. 2009. ★
- Buchanan, R.L. Potential Application of Risk Assessment Techniques to the Development and Implementation of HACCP Plans. Canadian Dairy Sci. Conf. 2009. ★
- Buchanan, R.L. Emergence of Quantitative Risk Management Metrics Derived Microbiological Testing Programs Based on Impact to Public Health. Canadian Dairy Science Conf. 2009. ★
- Buchanan, R.L. Understanding Foodborne Microorganisms, a Matter of Perspective. Internat. Assoc. Food Protection Ann. Meeting. 2010. ★
- Buchanan, R.L. Can Environmental Monitoring Coupled with Finished Product Testing Validate Adequacy of Food Safety Control Programs for Continuous Low Moisture Processes? Internat. Assoc. Food Protection Ann. Meeting. 2010. ★
- Buchanan, R.L. Food safety challenges facing the pet food industry. Waltham Internat. Nutritional Sci. Symp. 2010. ★
- Buchanan, R.L. Codex Alimentarius: Harmonizing food safety and quality standards globally. GMA Consumer Complaints Conf. 2010. ★
- Buchanan, R.L. Preparing for Emerging and Unknown Threats: Public Health. 23rd Annual National Agricultural Biotechnology Council Conference. 2011. ★
- Buchanan, R.L. Food safety risk management: A US perspective. IAFP European Symposium. 2011. ★
- Buchanan, R.L. Government and industry responsibility in managing food safety. 14th Australian Food Microbiol. Conf. 2011. ★
- Oni, R., R.L. Buchanan, and M. Sharma. Fresh produce safety: Survival of *Salmonella enterica* in an organic matrix (dried turkey manure). Ann Meeting Internat. Assoc. Food Protection. 2012.
- Williams, E.W. and R.L. Buchanan. Development of a QMRA mode for *Listeria monocytogenes* on frankfurters to determine risk-based critical control points at the processing level. Ann. Meeting of the Internat. Assoc. Food Prot. 2012.
- Buchanan, R.L. Developing risk management metrics for leafy greens and tomatoes. ICMSF/CIFSA Food Safety. 2012. ★
- Buchanan, R.L. Combining commercial data collection, targeted greenhouse and field trials and risk modeling to support scientifically informed risk management metrics for produce. Ann. Meeting Society Risk Anal. 2012. ★
- Buchanan, R.L. Risk-benefit assessment for chemical contaminants. Ann. Meeting Internat. Life Sci. Institute. 2013. ★

- Pang, H., R.L. Buchanan, D.W. Schaffner, and A.K. Pradhan. Quantitative risk assessment for *Escherichia coli* O157:H7 in fresh-cut lettuce. United Fresh Ann. Meeting. 2013.
- Xu, A., D. Pahl, R.L. Buchanan, and S.A. Micallef. Microbiological assessment and testing of organic pre- and post-harvest fresh produce and irrigation water on Maryland farms for *Salmonella*, *Listeria monocytogenes*, and Shiga toxin-producing *Escherichia coli*. United Fresh Ann. Meeting. 2013.
- Oni, R., R. Buchanan, and M. Sharma. Survival of *Salmonella enterica* in dried turkey manure. United Fresh Ann. Meeting. 2013.
- Pagadala, S. S. Marine, S.A. Micallef, F. Wang, R. Oni, M. Melendez, W. Kline, D. Pahl, C. Walsh, K.L. Everts, and R.L. Buchanan. A microbiological survey of small- and medium-sized produce farms in Maryland, Delaware, and New Jersey. United Fresh Ann. Meeting. 2013.
- Shenge, K.C., K.E. Knier, P. Spaninger, F. Hasem, C. Cotton, S. Micallef, S. Pagadala, M. Danyluk, J.T. LeJeune, and R.L. Buchanan. Observing relationships between microbial contamination in water and microbial contamination on tomatoes. United Fresh Ann. Meeting. 2013.
- Buchanan, R.L. Emerging Risk Management Tools – a Food Microbiology Perspective. 8th Dubai Internat. Food Safety Conf. 2013. ★
- Elisabetta Lambertini, E., R.L. Buchanan, C. Narrod, and A.K. Pradhan. Zoonotic diseases from companion animals: risk of salmonellosis associated with pet food. Ann. Meeting Soc. Risk Analysis. 2013.
- Buchanan, R.L. Limitations of Risk Assessment Based on the Fit-For Purpose/Invalidated Laboratory Methods. Ann. FERA-JIFSAN Symp. 2013. ★
- Pang, H., R.L. Buchanan, D.W. Schaffner, and A.K. Pradhan. Quantitative Risk Assessment for *Escherichia coli* O157:H7 in Fresh-cut Lettuce. Ann. Meeting Soc. Risk Analysis. 2013
- Mondal, A., R.L. Buchanan, and Y.M. Lo. Hygiene prediction of low moisture food mixer with computational fluid dynamics flow modeling. Ann. Meeting Instit. Food Technologists. 2014.
- Wang, Y. and R.L. Buchanan. Using “nutritional-shift” trials to develop mechanistic models of the lag phase of *Escherichia coli* K-12. Ann. Meeting Internat. Assoc. Food Protection. 2014.
- Lambertini, E., R.L. Buchanan, C. Narrod, and A.K. Pradhan. Use of a quantitative risk assessment model to estimate salmonellosis exposure associated with dry pet foods. Ann. Meeting Internat. Assoc. Food Protection. 2014. ★
- Lambertini, E., H. Cao, M. Guo, a. Mishra, R.L. Buchanan, and A.K. Pradhan. Decline of *Salmonella* on artificially contaminated dry pet food. Ann. Meeting Internat. Assoc. Food Protection. 2014.
- Oni, R. and R.L. Buchanan. Assessing the potential for *Salmonella* growth in rehydrated dry dog food in a simulated home environment. Ann. Meeting Internat. Assoc. Food Protection. 2014.
- Buchanan, R.L. Statistical principles for sampling plans and how they also impact conventional and rapid microbiological methods. Rapid Methods in Food Safety Microbiology Symposium, 2014. ★

- Buchanan, R.L. FAO/WHO *Listeria monocytogenes* quantitative microbiological risk assessment. JIFSAN Annual Food Safety Symp. 2015. ★
- Buchanan, R.L. Risk assessments as it relates to achieving zero. Ann. Meeting Internat. Assoc. Food Protection. 2015. ★
- Buchanan, R.L. Potential role of indicator microorganisms for food safety, FSMA. Rapid Detection Food Safety Conf. 2015. ★
- Turner, E., R. Buchanan, Y. Luo. Survival of *Escherichia coli* on Muzuna microgreens during growth. Ann. Meeting Internat. Assoc. Food Protection. 2015.
- Buchanan, R.L. *Salmonella* transmission linked to contamination of pet foods: What have we learned? Ann. Meeting Internat. Assoc. Food Protection. 2015. ★
- Buchanan, R.L. International risk assessment – International agreement??? Ann. Meeting Internat. Assoc. Food Protection. 2015. ★
- Buchanan, R.L. Predictive microbiology and risk analysis: How the world is benefiting from your efforts. Internat. Conf. Predictive Modeling Foods. 2015. ★
- Wang, Y. and R.L. Buchanan. Mechanistically modeling the transition periods between lag / exponential and exponential / stationary phases of *Escherichia coli* K-12. Internat. Conf. Predictive Modeling Foods. 2015.
- Ruan, L. and R.L. Buchanan. Modeling the enhanced thermal inactivation of *Cronobacter sakazakii* by inclusion of “parabens.” Internat. Conf. Predictive Modeling Foods. 2015.

## II.F. Professional Publications

### II.F.1. Reports and Non-Refereed Monographs

- Smith, J. L.,\* Benedict, R. C. and Buchanan, R. L. *Listeria monocytogenes* in meat and poultry: review of factors affecting its introduction and growth in foods. Technical Report to USDA Interagency Task Force on *Listeria* in Foods. 1987.
- Buchanan, R. L.\* and Lindqvist, R. Hazard Identification and hazard characterization for *Listeria monocytogenes* in refrigerated ready-to-eat foods. Report of the FAO/WHO Expert Consultation on Risk Assessment. World Health Organization. Geneva, Switzerland. 2000.
- Buchanan, R. L.\* and Dennis, S. Conduct of quantitative microbial risk assessments by U.S. Food and Drug Administration’s Center for Food Safety and Applied Nutrition: Lessons learned. WHO Expert Consultation on the Interaction between Risk Managers and Risk Assessors. Kiel, Germany. 2002.
- Buchanan, R. L.\* The role of quantitative microbial risk assessment in risk management options assessment. WHO Expert Consultation on the Interaction between Risk Managers and Risk Assessors. Kiel, Germany. 2002.
- Buchanan, R.L.,\* Destro, M.L., Whiting, R.C., and Ross, T. Case Study: *Listeria monocytogenes* in Smoked Fish. Development of Risk Management Metrics for Food Safety. Joint FAO/WHO Expert Consultation on “Development of Practical Risk Management Strategies based on Microbiological Risk Assessment Outputs.” Kiel, Germany. 2006.
- Institute of Medicine (S.A. Miller,\* G.R. Acuff, R.L. Buchanan, M.P. Doyle, J.J. Maurer, C.A. Reed, S.C. Ricke, J.M. Ruzante, and R. Tauxe). Review of the use of process control indicators in the FSIS public health risk-based inspection system: A letter report. Washington, DC. The National Academies Press. 2009

## II.G. Book Reviews, Notes, and Other Contributions

## II.G. 5. Other

- Buchanan, R. L.\* *Listeria* as a foodborne pathogen: Letter to the Editor. Food Microbiol. 6(3). 1989.
- Whiting, R. C.^ and Buchanan, R. L.^ Letter to the editor: A classification of models in predictive microbiology - a reply to K. R. Davey. Food Microbiol. 10:175-177. 1993.
- Buchanan, R. L.\* 1<sup>st</sup> International conference on microbiological risk assessment: foodborne hazards – What we heard. J. Food Protection 67:2072-2074. 2004.

## II.I. Significant Works in Public Media

### II.I.4. Interactive Online Database

- Maintains three bibliographies related to produce safety (<http://cfs3.umd.edu/databases/>)
- Maintains fourteen reference databases for various subjects related to the microbiological safety of foods (<http://foodrisk.org/exclusives/cfs3/>)

## II.J. Sponsored Research

### II.J.1. Grants

- USDA/NIFA/SCRI. Developing Scientifically-based Consensus Food Safety Metrics for Leafy Greens and Tomatoes. \$10,157,853. September, 2011 to August, 2016. Principal Investigator. There are total of 16 co-investigators representing a consortium of scientists from 7 universities and two federal agencies.
- USDA/NIFA/AFRI. Risk Identification for *Toxoplasma* transmission in Pasture Raised Animals. \$499,856. July, 2012 to June 2015. Co-investigator (3%). PI: A. Pradhan.
- USDA/ARS/BARC. Cooperative Agreement: Data Systems Analysis. \$1,200,000. August, 2012 to August 2017. Principal Investigator.

### II.J.2. Contracts

- ISN Corporation. Development of Food Defense/Food Safety Distance Learning Training Program for Veterans Administration. \$125,250. March 2011 to 2012.
- MARS, Inc. Exposure Assessment for the Risk of *Salmonella* Contamination in Dry Pet Foods. May, 2012 to April, 2014.
- Infant Formula Council. Development of Scientific White Paper on Use of Microbiological Indicators for Assessing Hygiene Controls for the Manufacture of Powdered Infant Formula. \$5,000. December 2010 to January 2012.

## II.L. Submissions and Works in Progress

### II.L.3. Manuscripts Under Review.

- Oni, R, Sharma, M. and Buchanan, R.L.\* Survival of *Salmonella* spp. in dried turkey manure and persistence on spinach leaves. Journal of Food Protection (Submitted for Publication, Jan, 2015)

## II.M. Centers for Research, Scholarship, and Creative Activities

### II.M.2. Centers Directed

- Director of Center for Food Safety and Security Systems (which includes managerial oversight of the Joint Institute of Food Safety and Applied Nutrition).





## II.O. Other Research/Scholarship/Creative Activities

- Co-developer and project leader for the first seven releases of USDA Pathogens Modeling Program, a widely used predictive microbiology software program for microbiological food safety (<http://ars.usda.gov/Services/docs.htm?docid=6784>)

## **III. Teaching, Mentoring and Advising.**

### III.A. Courses Taught

My position as Director of the Center of Food Safety and Security Systems is administrative and as such I am not required to teach. However, as a personal commitment to the University and my profession, I voluntarily teach the following courses.

- NFSC-430/679M Food Microbiology (3 credits). Annually for the past 5 years for junior/senior students. Enrollment is in the range of 30 to 50 students. It is also offered (with additional assignments to entering Master students who do not have a Food Microbiology course).
- NFSC-434 Food Microbiology Laboratory (3 credits). Annually for the past 5 years. An accompanying laboratory course that provides students with practical skills needed to function in a food microbiology laboratory while simultaneously demonstrating the concepts introduced in NFSC-430. Course capped at 20 – 25 students.
- NFSC-735/MIEH-735 (3 credits) Food Toxicology. Jointly taught annually for the past 3 years by Dr. Paul Turner and myself. Enrollment ranges from 5 to 10 graduates. I am responsible for approximately 30% of the lectures.

### III.C. Advising: Research or Clinical

#### III.C.2. Master's

- Ruth Oni. 2011 to 2013. Currently enrolled in Ph.D. program at University of Maryland. Advisor and Committee Chair.
- Aixia Xu. 2012 to 2014. Currently enrolled in Ph.D. program at the University of Maryland. Co-advisor with Shirley Micallef (Department of Plant Science)
- Mary Theresa Callahan. 2013 to 2015. Currently working as a support scientist in the Department of Plant Science at the University of Maryland.
- Luxi Ruan. 2014 to present. Advisor
- Junchao Lu. 2014 to present. Advisor
- Kathleen Sanders. 2013 to present. Advisor
- Hao Pang. 2012 to 2014. Committee Member
- Miao Wang. 2012 to 2014. Committee Member

#### III.C.3. Doctoral

- Nancy (Tong) Liu. 2011 to 2013. Currently a post-doctoral fellow in a joint research project between the USDA/ARS/Beltsville and the University of Maryland. Committee Member.
- Magaly Toro. 2010 to 2014. Currently a research associate at the Food and Drug Administration. Committee Member.
- E. Noelia Williams. 2009 to Present. Currently on leave of absence. Advisor and Committee Chair.
- E. Turner. 2014 to Present. Advisor
- Yangyang Wang. 2012 to Present. Advisor
- Ruth Oni. 2014 – Present. Advisor
- Aixia Xu. 2014 to Present. Advisor

- Abhinav Mishra. 2014 to Present. Committee Member
- Miao Guo. 2013 to Present. Committee Member

#### III.C.4. Post-doctoral

- Fei Wang. 2014 to Present. Supervisor.

#### III.G. Other Teaching Activities

One of the major activities of the Center for Food Safety and Security Systems/Joint Institute of Food Safety and Applied Nutrition are training courses. Examples of training activities during the past several years are listed below.

- Global Food Law and Food Safety Policy. March 16-20, 2015. Klang, Malaysia.
- Introduction to Risk Analysis. January 12 – 16, 2015. Klang, Malaysia.
- International Food Law. September 29 – October 1, 2014. College Park, MD
- One Health Training – Public Policies. August 19 – 22, 2014. Copenhagen, Denmark
- Introduction to Risk Analysis. April 6, 2014. Washington, DC
- Global Food Law and Regulations. Marcy 16 – 21, 2014. Klang, Malaysia
- Food Safety and Food Defense. January 6 -10, 2014. Klang, Malaysia
- IFSTL Microbiological Testing Short Course. January, 2013. College Park, MD
- IFSTL Salmonella Short Course. June, 2013
- Introduction to Risk Analysis. December, 2011. Taipei, Taiwan
- Introduction to Risk Analysis. June, 2011. Hyderabad, India

### **IV. Service and Outreach**

#### IV.A. Editorships, Editorial Boards, and Reviewing Activities

##### IV.A.1. Editorships

- Contributing Editor, Food Microbiology (1987 - 2010)

##### IV.A.2. Editorial Boards

- Journal of Food Protection (1984 - Present)
- Applied and Environmental Microbiology (2008 – Present)
- Journal of Food Contamination (2014 – Present)
- Foods (2014 – Present)
- Journal of Quantitative Microbiology (1998 - 2001)
- Journal of Food Safety (1974 - 2004)

##### IV.A.3. Reviewing Activities for Journals and Presses

In addition to the editorial boards above, during the past 5 years I have been an active reviewer for the following journals.

- International Journal of Food Microbiology
- Food Control
- Annals of Food and Nutrition Research
- American Journal of Epidemiology
- Animal Feed Science and Technology
- Antonie van Leeuwenhoek Journal of Microbiology
- British Food Journal

- Biotechnology Reports
- Canadian Veterinary Journal
- Emerging Infectious Diseases
- Food and Chemical Toxicology
- Food Technology and Biotechnology Journal
- Journal of Food Science
- Journal of Agricultural and Food Chemistry
- Journal of Applied Microbiology
- Journal of the Science of Food and Agriculture
- Letters in Applied Microbiology
- LWT - Food Science and Technology
- Nutrition Reviews
- Society for Risk Analysis
- Zoonoses and Public Health

#### IV.A.4. Reviewing Activities for Agencies and Foundations

- Served

#### IV.A.5. Reviewing Activities for Conferences

#### IV.A.6. Historical Editorships, etc. (10+ years ago)

#### IV.A.7. Other

### IV.B. Committees, Professional & Campus Service

#### IV.B.1. Campus Service – Department

- Chair of the Graduate Admissions Committee for the Department of Nutrition and Food Science (2011 to Present)

#### IV.B.2. Campus Service – College

- AGNR APT Committee (2013 – 2015)
- AGNR Administrative Council

#### IV.B.3. Campus Service – University

- Representative to University Senate (2010-2012)

### IV.C. External Service and Consulting

#### IV.C.1. Community Engagements, Local, State, National, International

- Served on multiple National Academy of Sciences, Institute of Medicine committees
  - “Committee on Microbial Threats to Health” (1991 - 1992);
  - “Review of the use of process control indicators in the FSIS public health risk-based inspection system: A letter report” (2008-2009);
  - “Strengthening Core Elements of Food and Drug Regulatory Systems in Developing Countries” (2010-2012).
- Member of Joint USDA/HHS National Advisory Committee for Microbiological Criteria for Foods. (1988-1990, 1992 - 2002)

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#### IV.C.2. International Activities

- Member, International Commission on Microbiological Specification for Foods (1990 - 2011), and currently serving as an emeritus consultant.

- U.S. Head of Delegation to the Codex Alimentarius Committee on Food Hygiene (1998 to 2008)
- Served on multiple International Expert Panels for the United Nations Food and Agriculture Organization and the World Health Organization

#### IV.C.5. Consultancies

- Active consultant to both the federal government and the food industry (see Outside Activity Report for details)
- Actively sought to service as an expert witness in civil matters related to the safety of foods (see Outside Activity Report for details)

### **V. Awards, Honors and Recognition**

#### V.1. Research Fellowships, Prizes and Awards

- Honor Graduate, U.S. Army Quartermaster School (1974).
- Dawson Post-Doctoral Fellow (1974 & 1975). Two-time recipient of this competitively awarded fellowship sponsored by the College of Agriculture of the University of Georgia.
- Drexel Research Scholar Award (1978). Awarded to young investigator for excellence in research.
- Four-time recipient of ARS Research Associate Program Awards (1984, 1987, 1989, 1996).
- Eastern Regional Research Center EEO Award (1990)
- FDA EEO Award (2003)
- Elected:
  - Member of Phi Tau Sigma (Honorary Food Science Society) (1972)
  - Member of Alpha Zeta (1970)
  - Member of Sigma Xi (Honorary Research Society) (1972)
- Fellow of the American Academy of Microbiology (1990)
- Fellow of the Institute of Food Technologists (
- Eight-time recipient of USDA Certificates of Merit for Research and Research Management (1988, 1989, 1990, 1991, 1992, 1994, 1996, 1997).
- FDA Distinguished Career Service Award (2008)
- Seven-time recipient of FDA Certificate of Merit for Research and Research Management (1998, 1999, 2000, 2001, 2002, 2003)
- Four-time recipient of FDA Certificate of Merit for Advances in Microbiological Risk Assessment (2003, 2004, 2005)
- Recipient of FDA Certificate of Merit for Leadership in Advancing International Activities for serving as United States Delegate to the Codex Alimentarius Committee on Food Hygiene (CCFH) and the World Health Organization (WHO) and the Food and Agriculture Organization (FAO) (2006).
- FDA Leadership Award for serving as the FDA Lead for the 2005-2006 Combined Federal Campaign.
- National Laboratory Consortium Award of Merit for Technology Transfer (1993).
- Philadelphia Federal Executive Board Silver Award for Technology Transfer (1993).

- USDA Superior Service Award (1993). Group leader for award presented to the Microbial Food Safety Research Unit for its pioneering research in predictive food microbiology.
- ARS Outstanding Senior Scientist of the Year Award (1994).
- Appointed to the HHS Senior Biomedical Research Service (1997)
- DHHS Secretary's Award for Distinguished Service (2001) (Individual)
- DHHS Secretary's Award for Distinguished Service (2003) (Group)
- University of Wisconsin Fraiser Memorial Lectureship Award for Outstanding Contributions to Food Microbiology (1995).
- Institute of Food Technologist Jules Bauermann Lectureship Award for Outstanding Contributions to Food Science (1997).
- North Carolina State University Escker Lectureship Award for Outstanding Contributions to Food Microbiology (1998).
- Malcom Trout Visiting Scholar Lectureship. Michigan State University (2001)
- Institute of Food Technologist Division of Microbiology Lectureship Award (2002).
- American Chemical Society Sterling B. Hendricks Memorial Lecture Award (2004).
- Food Safety World Award for Excellence in Food Safety Communication (2004)
- Silliker Lectureship Award. International Association for Food Protection (2010)
- Woodruff Lectureship Award. University of Georgia (2011)
- ISI Award for "Most Cited" Scientific Author, 2002.
- Rutgers University Alumni Society Lifetime Achievement Award, (2010)
- IAFP President's Lifetime Achievement Award (2012)