

**Kenneth Ray Swartzel**  
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**Academic Rank:** William Neal Reynolds Distinguished Professor Emeritus, Departments of Food, Bioprocessing, Nutrition Sciences and Biological and Agricultural Engineering.

**Education:** 1970 -Bachelor of Science - Food Science: *Engineering Concentration (MAE- Aerospace)*, North Carolina State University  
1974 -Master of Science - Food Science: *Food Engineering*  
Minor - Civil Engineering: *Water Resources Engineering*, North Carolina State University  
1979 -Doctor of Philosophy - Biological and Agricultural Engineering.  
Minor - Mechanical and Aerospace Engineering: *Heat Transfer and Fluid Flow*; North Carolina State University

**Academic Specialty** Food Engineering: *Reaction Kinetics, Heat Transfer and Fluid Flow with research efforts resulting in over 127 publications, 226 presentations, 24 U.S. and numerous Foreign Patents, domestic and foreign patents applications pending, 16 M.S. and 15 Ph.D. programs completed, as chair or co-chair, provided training/mentoring for 16 post-docs/visiting professors, been PI or Co-PI for over \$26 million in outside research support (plus over \$5.5 million in equipment donations to N.C. State University). Founded or Co-founded two NSF research centers, two Master Research Agreements, and one Kellogg/APLU national leadership Institute (Food System Leadership Institute, FSLI). Royalties to N.C. State University from licensed patents from Dr. Swartzel's lab have exceeded \$24 million, with 8 start-up companies all founded in North Carolina.*

**Administrative Experiences**

Administrative responsibilities began in industry. At the time Dr. Swartzel left Tri-Clover in 1972 he transferred 32 active engineering projects. Project engineers worked with clients, designed projects, managed the proposals, and supervised the order, installation and start-up. Similar administrative responsibilities were utilized with an engineering consulting firm in Richmond, Virginia (1974-75). His personal research program is outlined in the material to follow. In 1987, the charter for the National Science Foundation (NSF) I/UCRC Center for Aseptic Processing and Packaging Studies (CAPPS) was granted at the UNC system level. Over the 37-year existence of CAPPS, industry membership funding has allowed this NSF Center to fund in excess of 260 research projects at 14 major US universities involving 78+ faculty members, 27+ visiting scientists, 42+ post-doctoral fellows, 117+ graduate students, 62+ undergraduates and 27+ technicians. In 1994, the University of California@ Davis and in 1998 The Ohio State University were added as official NSF center sites, and the name was changed to the Center for Advanced Processing and Packaging Studies to better reflect the then current industry focus. Dr. Swartzel served as Director, Managing Director and site-director of CAPPS.

In 1991 the Michael Foods Single Sponsored Laboratory was established as the first Master Research Agreements on campus. Throughout the nine years of operation \$705,000 was leveraged to support 36 projects with 14 different NC State University faculties. Dr. Swartzel served as Managing Advisory Panel Chair three times.

In 1993 he became Interim Head and in 1994 Dr. Swartzel became Head of the Department of Food Science. Duties have involved management of a 26-29 faculty department with research, teaching and extension functions operating with a near \$10 million annual budget housed in a building of 100,000 sq.ft. Degrees have been granted at all four levels; Associate, B.S., M.S., & Ph.D. Within the structure of the department two USDA labs, a national center in dairy research (Southeast Dairy Foods Research Center), CAPPS, and several service units and master research agreements operate as well as a strong outreach and extension food science program covering a multitude of commodities and bioprocessing industries.

In 1999, a cooperative research agreement was established with Industrial Microwave Systems (IMS). In addition to funding projects, five different continuous flow microwave units were placed in the departmental pilot plant. These units, most custom made, provided industrial contract funding for the department, and became the vehicles for numerous graduate student studies, NCSU IP and spin off NCSU start-up companies. Dr. Swartzel served in a leadership role throughout this agreement.

In 2001, Dr. Swartzel was approached by the Office of the President to direct the North Carolina Technology Development Initiative (NCTDI). This experience allowed him to observe high level public institution administration firsthand. He led a high-profile program, attended the President's Cabinet meetings and participated in the Consolidated University Board of Governor's Meetings and Committees. At that time the Consolidated University System had 16 Academic Universities, >10,000 faculty and operated on a > \$6B budget. He traveled throughout NC, visiting with Chancellors, Provost, Deans and Chairs (Heads) relative to their vision and culture toward technology transfer and asset management. The program came in contact with 1,000 faculty during the one year. In July of 2003, Dr. Swartzel returned.

as head of Food Science and continued to be active in many of the administrative roles listed above until 2004.

In March of 2004, Dr. Swartzel was approached by Vice Chancellor Steve Jones to consider being listed as Director of a new program funded and supported by the W.K. Kellogg Foundation and the National Association of Public and Land-Grant Universities (NASULGC, now APLU) involving creation of a national Food Systems Leadership Institute (FSLI). Through many twist and turns the Institute ended up being funded and housed at the UNC-Office of the President. In the summer of 2006, NC State University became the host site. The FSLI was designed to prepare future land-grant university leaders for the emerging challenges associated with placing food systems in the context of the greater goals of modern society. Through 2023 and 19 cohorts, over 423 administrators from 41 states, APLU member institutions (state & 1994, 1890 & 1862 land grant institutions) along with members from industry and government have made up the two-year program. Participants give 15-20% of their time with Institute activities, including weekly sessions at three university sites.

In July of 2006, Dr. Swartzel became the Coordinator for the Bioprocessing Programs for the College of Agriculture and Life Sciences at NC State University. He remained Director of the FSLI. In 2008, he helped organize and became co-site Director of a new NSF I/UCRC-CBERT (The Center for Bioenergy R&D). In July of 2012 Dr. Swartzel entered the phase retirement program with near 40 years of retirement credit. During the 1<sup>st</sup> year of three he continued to direct FSLI while also serving as Co-PI on over \$3.5 million of external funded projects. In June of 2015 Dr. Swartzel completed his phase retirement. He continues to be a source of knowledge for universities and many industrial aseptic audiences. In October 2016, Professor Swartzel was inducted into the National Academy of Engineering. In 2020, he was inducted into the National Academy of Inventors and in the same year became a Fellow of the International Academy of Food Science and Technology. In 2023 He became Director of the Institute for Thermal Processing Specialists, “an international organization whose mission is to provide leadership and education for thermal processing specialists to enhance awareness and ensure public health safety by using the knowledge of a diverse membership through communication, networking, and research”.

## **ACADEMIC AND PROFESSIONAL EXPERIENCE**

2023-present	Director, Institute for Thermal Processing Specialists
2020	Fellow, International Academy of Food Science and Technology
2020-	Member, National Academy of Inventors
2017-2018	Science Advisor, TruAseptics (Now owned by Lyons Magnus), Beloit, WI.
2016-	Member, National Academy of Engineering, USA
2016-2017	Science Advisor, Aseptia, Inc., Raleigh, NC
2015-	William Neal Reynolds Distinguished Professor Emeritus, Departments

- of Food, Bioprocessing, Nutrition Sciences and Biological and Agricultural Engineering.
- 2012- 2015 Entered phase retirement on a three-year commitment. Professor continues to be active as an expert witness and consultant.
- 2006-2012 30%-Director-FSLI, 70% assigned to the Dean's Office of the College of Agriculture and Life Sciences at NC State University as Coordinator for Bioprocessing Programs (Bioenergy).
- 2004-2006 80%-Director, The Kellogg/APLU Food System Leadership Institute, hosted by the UNC-Office of the President, 20% CAPPS Site Director and research project manager.
- 2002-2003 Director, The North Carolina Technology Development Initiative, an NSF funded program administered from the UNC Office of the President, Chapel Hill.
- 2002-2007 Site-Director, Center for Advanced Processing and Packaging Studies
- 1993-2002 Managing Director, Center for Advanced Processing and Packaging Studies
- 1994-2004 Head, Department of Food Science, NCSU (Special Administrative Leave-7/02-6/03)
- 1993-1994 Interim Head, Department of Food Science, NCSU
- 1993-present William Neal Reynolds Distinguished Professor, Departments of Food, Bioprocessing and Nutrition Sciences and Biological and Agricultural Engineering, N.C. State University
- 1989-1993 Professor, Departments of Food Science and Biological and Agricultural Engineering, NCSU
- 1987-1993 Director, Center for Aseptic Processing and Packaging Studies, NCSU
- 1985-1989 Associate Professor, Departments of Food Science and Biological and Agricultural Engineering, NCSU
- 1980-1985 Assistant Professor, Departments of Food Science and Biological and Agricultural Engineering, NCSU.
- 1979-1980 Postdoctoral, Department of Food Science, NCSU
- 1976-1979 Research Assistant, Department of Food Science, NCSU
- 1975-1976 Research Technician, Department of Biological and Agricultural Engineering, NCSU
- 1974-1975 Project Engineer, Engineering Equipment Company, Richmond, Virginia
- 1972-1974 Graduate Research Assistant, Department of Food Science, NCSU
- 1970-1972 Project Engineer, Ladish Company (Tri-Clover Division), Kenosha, Wisconsin

## **PROFESSIONAL ACTIVITIES**

### **Memberships:**

(With formal university retirement many are now either dropped or moved to emeritus status)

1. Institute of Food Technologists
2. American Society of Agricultural and Biological Engineers
3. American Institute of Chemical Engineers
4. International Association of Food Protection
5. Research and Development Associates for Military Food and Packaging Systems, Inc. (Institutional member)
6. Institute for Thermal Processing Specialists
7. Carolinas Association of Food Protection
8. Phi Kappa Phi
9. Sigma Xi
10. Phi Tau Sigma
11. Gamma Sigma Delta
12. Association of University Technology Managers (AUTM)
13. International Society of Pharmaceutical Engineers

### **Organizing Symposium/Workshop Committee Member:**

1. International Symposium on Aseptic Processing and Packaging, Hsinchu, Taiwan 1997 & 2017.
2. NCFST/CAPPS Workshop on Biovalidation of Aseptic Fillers. (Two workshops: Chicago 1997 and Raleigh 1998.)
3. NCFST/CAPPS Workshop on Multiphase Continuous Flow Food Processing. (Three workshops: Two in Chicago, 1995 and one in Raleigh 1996.)
4. International Symposium on Advances in Aseptic Processing and Packaging Technologies. Copenhagen, Denmark, 1995.
5. Organized and taught in 6 educational workshops on asset management and commercialization throughout the UNC system contacting just over 1000 faculty and administrators (2003-2004).
6. Organized and taught in excess of 38 workshops at N C State University, various organizations throughout the US and in four other countries on aseptic processing and packaging technologies.

**Advisory Committee Member:**

1. Southern Association of Agricultural Experiment Station Directors Advisory Committee on Food Science and Technology (AC-4). Stand-in Chair, as needed 1995-96.
2. Southern Association of Agricultural Experiment Station Directors. Advisory Committee on Human Nutrition (AC-14) 1996-2002.
3. Member, Editorial Adv. Board for the Ency. of Agricultural, Food, and Biological Engineering Marcel Dekker, Publisher.
4. Member, IFT Press Editorial Advisory Board. 2005-present.
5. Member, IFT Industrial Scientist Award Jury. 2006-2009.
6. Served in an ad hoc role on the NSF Alexander Schwarzkopf Prize Committee, solicited applications and jury, January 2007 through 2010 at the Annual Meeting of the NSF I/UCRC Center Director's Meeting, Washington, D.C.
7. Member, Technical Advisory Board, Nestle Research, Vesey, Switzerland, 2010-2012
8. Officiated at two FSLI NASULGC/APLU Commission Meetings/year, 2004-2012.
9. University Relations Task Team-International Society of Pharmaceutical Engineers.
10. Member and Chair, FS Depart. Pro. Com. for numerous faculty 2004-2011.
11. Member, Food Science Departmental Award Committee 2004-2009.
11. Member, NC State University Alexander Quarles Holladay Medal for Excellence Medal Jury-2007.

**Boards and Committees:**

1. Advance Food Sciences, Inc., Center for Ohmic Commercialization Technical Advisory Board 1992- 1993.
2. AIChE Food, Pharmaceutical and Bioengineering Division Research Committee 1984-90.
3. American Society of Agricultural Engineers, Transactions Food Engineering Division, ASAE Associate Editor 1982-89.
4. ASAE M-154 Award Committee 2002-2005.
5. ASAE FPE-03 Standards Group 1989-1991.
6. ASAE Publications Committee FE-041 1982-1990.
7. ASAE Deutz-Allis Competition, Judge 1988.
8. College of Agriculture and Life Sciences Open House Committee Chair 1995 - 1996.
9. College of Agriculture and Life Sciences Administrative Retreat Committee, Chair-2001.
10. College of Agriculture and Life Sciences-Department Head Facilitator 2000-2001.
11. College of Agriculture and Life Sciences-Animal Science Head Search Committee, Chair 1994 & 2001.
12. College of Agriculture and Life Sciences-Graduate Student Professional Workshop,

Member- 2001 & 2002.

13. College of Agriculture and Life Sciences Administrative Tour Chair 1995 & 2001.
14. College of Agriculture and Life Sciences New Faculty Tour Committee 1994.
15. College of Agriculture and Life Sciences Open House Committee 1994.
16. Department of Food Science University Day Committee Chair 1983.
17. Department of Food Science Facilities Committee 1987-1993.
18. Department of Food Science Honors and Awards Committee 1988-1993.
19. Department of Food Science Aseptic Processing Committee 1980-1993.
20. Department of Food Science Preliminary Exam Committee 1991-1993.
21. Department of Food Science Safety Committee Chair 1980-83.
22. Department of Food Science Social and Recreation Committee Chair 1989-93.
23. Department of Food Science Computer Service Committee 1982 -1988.
24. Department of Food Science Graduate Studies Committee 1984 -1988.
25. Department of Food Science Seminar Committee 1981-1986.
26. Dogwood Section, IFT, Chair 1999-2000, 380 members.
27. Dogwood Section, IFT, Chair-Elect 1998-1999, 365 members.
28. Editorial Advisory Board for Publication "Clean Rooms." 1988-1996.
29. Egg Technology Advisory Council, American Egg Board 1997-98.
30. Institute of Food Technologist Task Force-Research Needs-Food Technology-2001
31. International Society of Pharmaceutical Engineers, Univ.Relations Task Force, 2003-present
32. Journal of Food Processing and Preservation. Board of Editors 1984-Present.
33. Journal of Food Process Engineering, Editorial Board 1988-Present.
34. NC-136 Committee for Mass Transfer Consideration 1986-1993.
35. NC-136 Regional Project Chair 1990.
36. NC-136 Regional Project Vice-Chair 1989.
37. NC-136 Committee Chair for Project Revision and Renewal 1984.
38. NC-136 Committee Chair on Food Kinetics 1987-90.
39. NCSU Alumni Association Outstanding Research Award Selection Committee 1994.
40. NCSU Food Engineering Group Luncheon Seminars 1980-85.
41. NCSU Merit Scholarship Program Reviewer 1984-98.
42. North Carolina State University, International Core Faculty 1986-Present.
43. North Carolina Section ASAE Executive Committee 1988.
44. School of Agricultural & Life Science Long Range Planning Committee 1986.
45. SERA-TF 11 1998-2001.
46. Southeast Dairy Foods Research Center Operating Advisory Council 1988-2000.

47. Triangle Universities Licensing Consortium Board of Directors 1993-1995.
48. USDA-ARS Advisory Committee on Food Science and Technology (AC-4) 1995-2004
49. USDA-ARS Advisory Committee on Food and Nutrition (AC-14) 1996-2002
50. Wake Country Public Schools, Athens Drive Board Advisory Council 1992-95.
51. Wake County Public Schools, Cary Board Advisory Council, Facilities Committee Chair 1984-1989.
52. Wake County Public Schools, Cary Board Advisory Council 1983-1989.
53. Wake County Public Schools, Cary Board Advisory Council, Interim Chair 1988.
54. Biofuels, Represented CALS- at the RTEC-Kenan Energy Sym., RTP, Nov., 2007.
55. Member, Task Force-Review of the Umstead Act-appointed by President Broad, President of the UNC Office of the President-2004-2005.
56. N C State Representative on the National Agricultural Biotechnology Council-2006-2012.
57. Invited participant to serve on the planning council to the Executive Board to develop North Carolina's Strategic Plan for Biofuels Leadership. Report delivered to the N C General Assemble, April 2007.
58. Chair, IFT Industrial Scientist Award Jury 2009.
59. Jury member, IFT Nicolas Appert Award, 2013-2016.
60. Jury Member, NCSU Innovator of the Year Award. 2012-2016.
61. Committee Member, Peer Review Membership for Section 12, NAE. 2018-2021.
62. Strategic Planning Working Group, Section 12, NAE. 2018.

**Activities:**

1. Task Force on Utilization of University-Based Food Processing Centers (SERA-TF11) Member 1997-98
2. Aseptic Processing & Packaging short course taught sponsored by Cook College, Rutgers University New Brunswick, NJ, March 1991 - 2000.
3. Director and lecturer for Aseptic Processing and Packaging Fundamentals, sponsored by the Society of Manufacturing Engineers, Sept. 28 Chicago, IL and Dec. 6, 1999 and Dec. 4, 2000 Raleigh, NC.
4. Director and lecturer for Advanced Aseptic Processing and Packaging sponsored by the Society of Manufacturing Engineers, Dec. 7-8, 1999 and Dec. 5-6, 2000, Raleigh, NC.
5. Co-chair and lecturer in Practical Innovations in Aseptic Processing and Packaging, sponsored by the Society for Manufacturing Engineers, Sept. 29, 1999 Chicago, IL.



6. Invited to participate in the UNC-GA/NCSU Research review-2001.
7. Interdepartmental involvement with the Department of Chemical Engineering- Creation of a NC Bio-Processing Center. This resulted in a joint Food Science/Chemical Engineering Co- PI project with NSF to develop a curriculum for the program.
8. Collaborative research with overseas linkages-Campden Food Research Association, Campden, England; SIK, Goteborg, Sweden and FIRDI, Hsinchu, Taiwan.
9. Co-Chair the CALS Bioprocessing Committee-developed white paper “A New Kind of Agriculture for North Carolina: The Case for Bioprocessing” was submitted to The College of Agriculture and Life Science on December 28, 2004, North Carolina State University. Committee was co-chaired by Drs. Jim Young and **K.R. Swartzel** with assistance from Dr. Winston Hagler and Mr. Dave Caldwell. Committee consisted of 22 CALS faculty members.
10. Facilitated a discussion group at the NSF I/UCRC 2008 Annual Meeting on Meeting the Challenges of Self-Sufficiency. Key Bridge Marriot, Arlington, Virginia.
11. NC State University Co-site leaders at the NSF I/UCRC Planning Meeting to establish a Multi-site Center on Bioenergy R &D. March 24-25, 2008 Minneapolis, MN.
12. Met with various graduate student, administrators at NC State University concerning Entrepreneurship & Commercialization, 2018-19.

## **AWARDS AND HONORS**

1. Forbes Chocolate Award 1970.
2. NC Dairy Foundation Assistantship 1972-1974.
3. Dairy Research Foundation Postdoctoral Fellowship 1980.
4. American Chemical Society Aseptic Processing Symposium, Agricultural and Food Division, Invited Speaker April 1984.
5. N.C. State University. Full Member of the Graduate Faculty 1984.
6. Campbell Institute of Research and Technology. Invited Speaker 1984.
7. IUFoST Symposium on Aseptic Processing and Packaging of Foods, Tylosand, Sweden. Invited Speaker 1985.
8. Monterey Seminar Group, Aseptic Processing and Packaging. Invited Speaker 1986.
9. IFT Symposium on Industry/University Cooperative Research Program/Food Industry. Invited Speaker 1987.
10. New Technologies for the Food Industry Conference, Carmel, CA, Invited Speaker. 1988.
11. Fifth International Conference on Aseptic Packaging, Bloomingdale, IL, Invited

- Speaker. 1988.
12. NATO Sponsored Advanced Research Workshop on Food Properties and Computer-Aided Engineering of Food Processing Systems. Porto, Portugal. Invited Participant 1988.
  13. International Poultry Trade Show, Atlanta, GA. Invited Speaker 1989.
  14. Fifth International Conference on Designing and Engineering New Food Factories, Chicago. Invited Speaker, 1990.
  15. First Annual NCSU Inventors Award Luncheon 1990. Citation of Merit.
  16. Second Annual NCSU Inventors Award Luncheon 1991. Two Citations of Merit.
  17. Third Annual NCSU Inventors Award Luncheon 1992. Four Citations of Merit.
  18. Fourth Annual NCSU Inventors Award Luncheon 1993. Two Citations of Merit
  19. NCSU Alumni Magazine June 1992. Highlighted work associated as the anchor invention for the university.
  20. Post-doc Dr. Ashwini Kumar named 1991 and 1992 Fellow of the North Carolina Supercomputing Center.
  21. COST '93 Project, Ede, Netherlands. Invited Speaker 1993.
  22. National Technology Initiative Conference Sponsored by the U.S. Department of Commerce, University of Central Florida. Invited Speaker 1993.
  23. International Symposium on Aseptic Processing and Packaging Technology for Prepared Foods, Food Industry Research and Development Institute, Hsinchu Taiwan. Invited Speaker 1993.
  24. NCSU Alumni Association Outstanding Research Award, 1993
  25. William Neal Reynolds Distinguished Professorship, 1993-present
  26. Research Perspectives, North Carolina Agricultural Research Service vol. 19. No. 2 1993. Featured article "*Now He's aloft in the Space-Age of Foods.*"
  27. Harold Macy Award & Lecture, Minnesota Section of IFT 1994.
  28. NCSU Sigma Xi Chapter Spring Banquet Selected Speaker 1994.
  29. IFT Food Technology Industrial Achievement Award. NCSU Team member 1994.
  30. *Food Technology* cover picture and feature article, September 1994, p 94-96.
  31. International Association of Milk, Food and Environmental Sanitarians Educator Award 1994.
  32. National Agri-Marketing Association Carolina-Virginia Chapter, National Award for Agricultural Excellence 1995.
  33. Eight Annual NCSU Inventors Award Luncheon 1998. Two Citations of Merit.
  34. National Agri-Marketing Association, National Award for Agricultural Excellence 1997.
  35. Institute of Food Technologists, Elected Fellow 1998.
  36. Kenneth R. Keller Research Award. Post-doc Dr. Josip Simunovic for excellence in doctoral dissertation research, 1998.
  37. Ninth Annual NCSU Inventors Award Luncheon 1999. Citation of Merit.

38. International Association of Food Industry Suppliers Association and the Food and Process Engineering Institute. Food Engineer of the Year Award 1999.
39. Tenth Annual NCSU Inventors Award Luncheon 2000. Citation of Merit
40. Eighth International Congress on Engineering and Food, Pueblo, Mexico. Invited Speaker 2000.
41. Eleventh Annual NCSU Inventors Award Luncheon 2001. Citation of Merit
42. Distinguished Food Engineering Plenary Speaker to the 25<sup>th</sup> Food Engineering Division Symposium of the Food Technologists, New Orleans, June 2001.
43. Twelfth Annual NCSU Inventors Award Luncheon 2002. Citation of Merit
44. American Society of Agricultural Engineers, Elected Fellow, 2003.
45. Thirteen Annual NCSU Inventors Award Luncheon 2003. Two Citations of Merit.
46. Fifteen Annual NCSU Inventors Award Luncheon 2004. Citation of Merit
47. Awarded the NC State University Holladay Medal. 2006 (Highest Award Presented by NC State University for Life Time Achievements)
48. Seventeenth Annual NCSU Inventors Award Luncheon 2006. Citation of Merit
49. Eighteenth Annual NCSU Inventors Award Luncheon 2007. Two Citations of Merit
50. Nineteenth Annual NCSU Inventors Award Luncheon 2008. Two Citation of Merit.
51. Institute of Food Technologist, Myron Solberg Award for establishing Industry/University/Government Cooperative Organizations 2008.
52. NSF 2007, 2009 Compendium of Industry-Nominated I/UCRC Technology Breakthroughs: Continuous Flow Microwave Processing-CAPPS
53. IFT Food Technology Industrial Achievement Award. NCSU Team member. 2009.
54. USDA / ARS 2010 Award for Superior Efforts in Technology Transfer.
55. Original process concepts leading to MicroThermics IFT Industrial Achievement Award, 2011
56. NC State Innovator of the Year Award-2011
57. Order of the Long Leaf Pine-presented by Governor Bev Purdue of North Carolina-2012
58. IFT Nicholas Appert Award, 2012-highest award presented by Institute of Food Technologist.
59. News and Observer "Tar Heel of the Week", August 11, 2013.
60. Recognized for outstanding service as founding director of the FSLI at the 10<sup>th</sup> anniversary celebration. October 2013.
61. Honored by establishing the National APLU Food System Leadership Award, 2014.
62. 2014 NCSU Department of Biological and Agricultural Engineering Alumni of the Year.
63. Twentyfifth Annual NCSU Inventors Award Luncheon 2014. Citation of Merit.

64. Original process concepts leading to Aseptia, Inc. IFT Industrial Achievement Award, 2015.
65. Original process concepts leading to Aseptia, Inc. Edison Gold Award. 2015.
66. Original process concepts leading to Aseptia, Inc. Edison Silver Award. 2016.
67. Inducted as a member of The National Academy of Engineering, October 2016.
68. Inducted as a member of the National Academy of Inventors, March, 2020.
69. Elected Fellow, International Academy of Food Science and Technology, 2020

## **OTHER**

### **Reviewer-Journals:**

1. Journal of Food Science
2. ASAE Transactions
3. Journal of Food Processing and Preservation
4. Lebensmittel-Wissenschaft und-Technologie
5. Biotechnology Progress
6. Journal of Food Process Engineering
7. NSF Project Peer Review
8. Journal Agricultural Food Chemistry
9. Journal Texture Studies
10. Journal of Food Engineering

### **Reviewer –Review Panels:**

1. BARD Peer Review 1994-96.
2. NSF STATE/IUCRC Review Panel 1995-98.
3. U.S. Department of Commerce Advanced Technology Award Program, Small Business Innovation Research. (USDA). Ad hoc reviewer 1995-96, 2000-2003.
4. Alabama Research Institute. Proposal Review Panel 1998.
5. USDA Competitive Grants Program. 1994-00.
6. Midwest Advanced Food Manufacturing Alliance Research Grant Program. Panel Reviewer 1995-2010.
7. Research Service Project #NC02140 *Kinetics of Continuous Flow Thermal Processes for Fluid Foods*. Co-leader 1980-94.
8. North Central Regional Project NC-136 *Improvement of Thermal Processes of Foods*. Co- leader to N.C. State Station #0836 1984-94.
9. N.C. Agricultural Research Service Project *Textural and Theological Criteria for Food Quality*. Cooperator 1980-92.
10. North Carolina Agricultural Foundation. Research Proposal Reviewer 1994-2000.
11. Department of Food and Nutrition, Iowa State University, CSREES Review, Committee Member, 2000.

12. 2007-- Reviewed grant proposals for: NC Dairy Foundation, NC Agricultural Foundation, and USDA Comp. Grants Program, MAFMA, NSF, US Department of Agriculture's SBIR program, U.S. Army Research Office, SDFRC, CAPPS and for the NC Space Grant Administration.
13. Member, Board of Editors for the Journal of Food Processing and Preservation (JFPP), Editorial Advisory Board for the Journal of Food Process Engineering, Advisory Committee on Food Science and Technology (AC-4), ASAE M-154 Award Committee (2002-2005).
14. Editorial Adv. Board for the Ency. of Agricultural, Food and Biological Engineering. Marcel Dekker, Publisher. Member-2006-present.
15. IFT Editorial Board 2004-2012.
16. Reviewer for U.S.Army Research Office, NC Space Grant Administration, US Department of Agriculture's SBIR program—2001-2012.
17. Department of FBNS Bioprocessing Advisory Board member, Dr. John Sheppard, Chair. 2010-2013.
18. Aseptic Committee Member, Institute of Thermal Process Specialist, 2010-2013.
19. National Academy of Engineering Research Reports, 2017 & 2018.
20. Section 12, NAE Peer Membership Review Committee, 2018-2021.
21. Section 12, NAE Strategic Planning Committee, 2018.
22. Member, Review Committee Department of Biological & Agricultural Engineering, September 8-12, 2019, University of Nebraska.
23. Contributor, 2018. The National Academies of Science, Engineering and Medicine report on Science Breakthroughs to Advance Food & Agriculture Research by 2030. <http://nap.edu/25059>.

## **DISSERTATION**

## **RESEARCH**

### **Programs Completed:**

1. Biziak, R.B., 1981. *Energy use in UHT Sterile Milk Processing*. M.S. Thesis, Co-chair (Food Science).
2. Ramsey, Joseph. *Rate of Sedimentation of Ultra-high Temperature Milk*. 1982. M.S. thesis, Chairman (Food Science).

3. Staton, J.S. 1983. *Modeling of an Adiabatic Stripping Column in a Coal Gasification Plant Acid Gas Removal System*. M.S. Thesis. Co-chair (Chemical Engineering).
4. Hamid-Samimi, Mohammad-H. 1984. *Criteria Development for Extended Shelf-life Liquid Whole Egg*. Ph.D. Thesis, Chair (Food Science).
5. Hawran, Laura. 1984. *Fouling During Processing and Sedimentation During Storage of Aseptic Milk*. Chair. MS. Thesis (Food Science).
6. Rakes, Phil. 1985. *Fouling on Heat Exchanged Surfaces Used in Thermal Processing of Dairy Products*. M.S. Thesis. December, Chair (Food Science)
7. Martinez, R.M. 1986. *Evaluation of ultrapasteurized aseptically packaged whole liquid eggs - homogenized and unhomogenized*. M.S. Thesis, Co-chair (Food Science).
8. Sadeghi, Farid. 1987. *Kinetic Studies of Calibration Materials for Thermal Evaluation of Food Systems*. Ph.D. Thesis. Chair (Food Science).
9. McGuire, Joe. 1987. *The Influence of Solid Surface Energetics on Macromolecular Adsorption from Milk*. Ph.D. Thesis. Co-Chair (Chemical Engineering).
10. McGuire, Ruth. 1988. *Aseptic Processing and Packaging Influences on Tomato Juice Characteristics with comparison to Conventional Canning*. M.S. Thesis. Co-chair (Food Science).
11. Rhim, Jongwhan. 1988. *Kinetic Studies of Thermal Evaluation Indicators of Dairy Products and Development of a New Kinetic Data Generation Method*. Ph.D. Thesis, Co-Chair (Fd. Sci.).
12. Liebrecht, Jeff. 1989. *Application of Direct Steam Contact Heating to Extend the Process Run Time of Heat Sensitive Biological Materials*. M.S. Thesis. Chair (Food Science).
13. Oamen, E.E., 1989. *Effect of ultra-high-temperature steam injection processing and aseptic storage on labile water-soluble vitamins in milk*. M.S. Thesis. Co-Chair (Food Science).
14. Yang, Binghui Barry. 1991. *Particle Residence Time Distribution Studies of Two phase Flow in Non-heated Straight Circular Conduct*. Ph.D. Thesis. May, Chair (Food Science).
15. Pastrana-Zuniga, Jose Francisco. 1991. *A Model for Heat Transfer Process that Occur During Canning, Ohmic and SSHE Aseptic Processing of Food Products with Large Particles*. Ph.D. Co-Chair (Bio-Mathematics).
16. Fairchild, Tim. 1992. *Thermal inactivation studies of pathogenic organisms during continuous flow* M.S. Thesis. Co-Chair (Food Science).
17. Miles, John. 1993. *Kinetic Data Generation of Ultra-high-temperature Processing Conditions*. Ph.D. Thesis. Chair (Food Science).
18. Nunes, Raul. 1993. *Nonisothermal Kinetic Data Generation and Thermal Process Evaluation and Optimization*. Ph.D. Thesis. Co-Chair (Chemical Engineering).
19. Pecsényicki, J.T. 1995. *Aseptic and Conventional Food Sterilization: A comparison of Direct Energy Use and Costs*. M.S. Thesis (Food Science).
20. Simunovic, Josip. 1998. *Visualization and Measurement of Multiphase Flows in Aseptic Holding Tubes Using Digital Video and Image Analysis*. Ph.D.

- Thesis, Co-Chair (Food Science).
21. Kyereme, Michael. 1998. *Theoretical and Mathematical Validation of the Equivalent Point Method for Thermal Process Evaluation*. Ph.D. Thesis, Co-Chair (Food Science).
  22. Shefet, Sarid. 1998. *Development of a continuous aseptic process to sterilize food particulates*. Ph.D. Thesis, Co-Chair (Food Science).
  23. Boldor, Dorin. 2000. *Image Analyses and Remote Sensing of Food Product Maturity*. M.S. Thesis, Co-Chair (Food Science and Biological and Agricultural Engineering).
  24. Sylvia, Stephen. *Crystal Formation in Aerosol Freezing*. Ph.D. Thesis, 2000. Chair (Food Science).
  25. Coronel, Pablo. 2001. *Pressure Drop and Heat Transfer Coefficients in Helical Heat Exchanges*. M.S. Thesis. Co-chair (Food Science).
  26. Palazoglu, T.K., 2001. *Effect of Holding Tube Configuration and Curvature Ratio on the Residence Time Distribution of Multiple Particles in Helical Tube Flow*. Co-Chair. Ph.D. (Food Science).
  27. Boldor, Dorin. 2003. *Thermal profiles and moisture loss during continuous microwave drying* Ph.D. Thesis. Co-chair (Food Science).
  28. Coronel, Pablo. 2005. *Rapid Heating of Fluids in Cylindrical Microwave Reactors*. Ph.D. Thesis. Co-Chair (Food Science).
  29. Riemann, A. 2007. *Thermal Gelation of Foods and Biomaterials Using Rapid Heating*. M.S. Thesis. Co-Chair (Food Science).
  30. Bryan, M.J. 2008. *Prioritizing core competencies for food systems leadership*. M. S. thesis, University of North Carolina at Chapel Hill. Ad.Hoc Co-Chair-Supervisor, FSLI.

**Non-Thesis Completed Degree:**

Smith, Edgar R. (Non-Thesis) Master of Life Sciences, 1995. Chair (Food Science).

**Post Doctoral Programs Completed: Mentor/Advisor**

1. Kawanari, Masami, Rheological and texture studies of butter, visiting Ph.D. from Snow Brand Dairies, Japan. Led by Don Hamann.
2. Abdelrahim, Khalid. Two-phase flow in helical configured round tube.
3. Fu, Frank. Kinetic Studies in Food Processing.
4. Lee, H.G. Enthalpy-entropy Compensation for a glucose-lysine Maillard Reaction.
5. Rhim, J.W., Kinetic compensation of heat denaturation of whey proteins.
6. Ganesan, Ganesh. Thermal Memory Cell and Thermal System Evaluation.
7. Kumar, A. Scale-up Studies for Dairy Foods Processing.
8. Miles, J.J. Aseptic technology in food and pharmaceuticals: Combining parallel technologies.
9. Nunes, R.V. Critical evaluation of existing methods for sterilization time calculations: Continuous and batch processes.
10. Palaniappan, S. Continuous flow electrical heating of single and two-phase food materials.
11. Samimi, Mohammad. Ultra-pasteurization and aseptic packaging of liquid whole eggs.

12. Simunovic, Josip. Application of remote sensing and digital image analyses in monitoring and evaluation of thermal processing of foods.
13. Sylvia, Stephen. Lyophilization of heat-labile biomaterials in a microwave cylindrical reactor.
14. Palazoglu, T.K. Conservative Process Evaluation for Multiphase Aseptic Processing.
15. Cristina Sabliov– Analysis of design parameters and their influence on continuous flow microwave processing-led by K.P. Sandeep.
16. Drew Rivers. Developing Scientific and Technological Leadership and Human Capital: Impact of IUCRC Directorship on Career Paths and Achievement. Psychology based led by Denis Gray.

**Member, Other Graduate Student Programs:**

1. M.S. programs - 15
2. Ph.D. programs - 22
3. Graduate representative - 6 Ph.D.

**Courses Taught:**

1. FS 680 Graduate Seminar in Food Science (1993-94).
2. FS 580 Food Kinetics (1982,1984, 1987, 1989, 1992, 1994, &1995).
3. FS 591 Spec. Prob. Food Science (1982,1983, 1985, &1987).
4. FS591N Aseptic Processing and Packaging (1996 & 1997).
5. Lectures regularly given in FS201, FS (BAE) 331, FS (BAE) 585, FS521, FS491J, & FS410.
6. Research Teaching in FS 599, FS699 & FS895.

**Grants:**

1. Dairy Research Foundation, *A Comparison of Direct and Indirect Methods for UHT Sterilization of Milk and Milk Products*. Investigator. 1979-82, \$65,500 (Indirect cost remitted).
2. Dairy Research Foundation, Supplement funding to above project. Investigator. 1982 \$5,000.
3. Diversey Wyandotte Corporation, *UHT CIP Cleaning*. P.I. 1984 \$2,500.
4. Southeastern Poultry and Egg Association, *Evaluation of Aseptic Packaging of Conventionally Pasteurized and Ultra-Pasteurized Whole Egg*. P.I. 1984-85 \$37,595 (Indirect cost remitted).
5. Dairy Research Foundation, *Identifying and Optimizing Processing and Cleaning Variables Associated with the Deposition and Removal of Scale Formed During Heating of Dairy Products*. P.I. 1984-86 \$66,650 (Indirect cost remitted).
6. NSF, *Planning Grant for the Center for Aseptic Processing and Packaging Studies*. P.I. 1986-1987 \$35,003.



7. NSF, *Operating Grant for the Center for Aseptic Processing and Packaging Studies*. P.I.1987-1992 \$484,810.
8. Southeastern Poultry and Egg Association, *The Use of Steam Injection to Increase Process Run Time for Long Shelf-life Refrigerated Liquid Egg Products*. P.I. 1988-1989 \$25,000 (Indirect cost remitted).
9. CAPPS, *Development of New Techniques for Thermal Process Evaluation – With and Without Particulates*.1987-1991 \$196,557 (Indirect cost remitted).
10. Research Institute for Food Engineering, *The Influence of Solid Surface Energetics on Adsorption from Fluid Foods* Co-P.I. 1988-91 \$52,000 (Indirect cost remitted).
11. Southeast Dairy Foods Research Center, *Scale-up Studies for Dairy-Foods Processing*. Co- P.I. 1989-92 \$125,510. (Indirect cost remitted)
12. North Carolina Supercomputing Center, *Mathematical Modeling and Numerical Simulations in Bioengineering Applications*. 01/1992 - 12/1992 \$7000, and 50 hours of CRAY Y/MP time.
13. North Carolina Supercomputing Center, *Numerical Analysis of Aseptic Processing of Liquid Products in a Tubular Heat Exchanger*. 04/1990 -03/1993 and 75 CPU hours on CRAY- Y/MP.
14. Memberships for the Center for Aseptic Processing and Packaging Studies. 1987-98, \$2,739,550.
15. Northern Star Company, *Reduction of Potato Processing Time and Retention of Product Texture*. P.I. 2/1/89- 8/1/89 \$6,309.
16. Northern Star Company, *Identification of Blanching and Pasteurization Conditions for Shredded Potatoes*. P.I. 09/1/1989- 11/ 30/1989 \$7,836.
17. NSF, *Cooperative Partnership Initiative Between CAPPS and the Institute Pertanian Bogor*.Co-P.I. 09/1992-09/1994 \$100,000.
18. North Carolina Supercomputing Center, *Fluid Flow and Heat Transfer in Steam Injection and Helical Heat Exchangers for Food Processing*. 04/1993 - 04/1994 \$7,000 and 50 hours of CRAY Y/MP time.
19. CAPPS, *Experimental Evaluation of Secondary Flows in Helical Heat Exchanges for Aseptic Processing of Liquid and Particulate*. Co-P.I. 06/1/1994-12/31/1995 \$74,123.
20. CAPPS, *Laboratory Unit to Validate Three-phase Processing*. Co-P.I. 07/1/1994 - 12/31/1995 \$23,976.
21. NSF, *Self-sustaining Partnership with the Center for Aseptic Processing and Packaging Studies*. P.I. 1992-1995 \$105,000.
22. CAPPS, *Measurement of Particle Residence Time in Multi-phase Aseptic Processing Systems Using Digital Video and Image Analysis*. Co-P.I. 05/15/1994 - 04/30/1996 \$71,559.

23. CAPPs, *Design and Testing of Fabricated Magnetic Tracer Particles for Residence Time Measurement*. Co-P.I. 05/1/1996-12/31/1996 \$15,833.
24. NSF, *Multi-University Merger Between CAPPs and the University of California, Davis*. P.I. 09/15/1994-08/30/1999 \$110,000.
25. Memberships for the CAPPs. 1998-2002 \$2,080,000.
26. Technology Transfer Office, NCSU, ESL. 10/1/1996-10/1/1999 \$200,000.
27. CAPPs, *Particle Flow Monitoring Using Luminescent Markers and Diffused Light Detection*. Co-P.I. 11/01/98-10/30/99 \$19,885.
28. CAPPs, *Investigation of Potential On-line and Off-line Infrared Imaging and Image Analysis Applications in Aseptic Processing and Packaging*. Co-P.I. 10/1/1996-10/30/1999 \$87,991.
29. NC Biotechnology Center and NC State University Kenan Institute. *Lyophilization of Heat- Labile Biomaterials in a Microwave Cylindrical Reactor*. Co-PI. 11/01/1999-10/31/2000 \$29,979 and \$15,000, respectfully
30. Campbell Soup Company. *Evaluation of Tubular Heat Exchanger Performance and Convective Heat Transfer Coefficient Measurement Using Thermal Switch Implants and Conservative In-flow Temperature Measurement*. Co-PI. 2/02/02-1/31/03 \$100,000.
31. Single Sponsor Laboratory (SSL) with MICHAEL FOODS, INC. of Minneapolis, Minnesota 09/15/1990-12/31/2000 \$705,340.
32. CAPPs, *Database Generation for Advanced Thermal Bioprocessing*. Co-P.I. 11/01/1998-10/31/2000 \$85,349.
33. NSF, *Multi-University Merger Between CAPPs, the University of California, Davis and The Ohio State University*. 09/1/1999 - 8/31/2003 \$240,000.
34. Industrial Microwave Systems. *Master Research Agreement*. 09/1/2000-08/31/2002-\$200,000, Co-PI
35. NSF.CAPPs-Administrative Support-NCSU site (2003) - \$48,000, Industrial memberships for the CAPPs (2003)-\$425,000-industrial funds now managed through The Ohio State University.
36. Two projects-CAPPs and Campbell Soup Company (5-20921 and 5-44037, total funded-\$170,071) are co-managed with Dr. Simunovic.
37. CAPPs-*Microwave assisted aseptic processing: extension of run times*-Drs. Sandeep and Siminovic Co-PIs-one year-\$32,950.
38. NASULGC/Kellogg Foundation, *Food System Leadership Institute*. PI. 07/1/2004-06/30/2009, \$1.18M
39. **Swartzel, K.R.**, J. Simunovic, Lee-Ann Jaykus and K.P. Sandeep USDA National Integrated Food Safety Initiative: *Safety of Foods Processed by Four Alternative Processing Technologies: Aseptic Processing Using Continuous Flow Microwave Heating*. \$384,545, February 2003-February 2007.

40. Simunovic, J. and **K.R. Swartzel**. *Development of Indicator Arrays for Cold Spot Determination and Time-Temperature Estimation*; Center for Advanced Processing and Packaging Studies, \$45,835, Feb. 2005-Dec. 2006.
41. Simunovic, J., **K. R. Swartzel** and K.P. Sandeep. *Microwave-Assisted Aseptic Processing: Extension of Run Times*. Center for Advanced Processing and Packaging Studies, \$32,950, 01/01/2004-06/30/2006.
42. CAPPS *Industrial memberships* plus carry-over for 2006 \$398,000.
43. CAPPS, *NCSU-Site administrative support* available through 2006-\$5,000.
44. Sandeep, K.P., and A. Kuznetsov, J. Simunovic and **K.R. Swartzel**. *Mathematical Modeling and Experimental Validation of Continuous Flow Microwave Heating of Liquid Foods*. USDA-NRI. \$169,000. 09/01/2003-08/31/2006.
45. FSLI *Tuition*-1<sup>st</sup> cohort, \$315,000 (7/05-6/08), 2<sup>nd</sup> cohort-\$255,000 (7/06-6/09), 3<sup>rd</sup> cohort- \$345,000 (7/07-6/09), 4<sup>th</sup> cohort-\$391,000 (7/08-6/10), 5<sup>th</sup> cohort-\$289,000 (7/09-6/11), 6<sup>th</sup> cohort-\$340,000 (7/10-6/12), 7<sup>th</sup> cohort, \$391,000 (7/11-6/13); 8<sup>th</sup> cohort- \$370,500 (7/12- 6/14), & 9<sup>th</sup> cohort-(7/13-6/12) \$459,000. (2007-2015).
46. NASULGC-*Board on Agricultural Assembly-FSLI Scholarship support*-\$102,000 (2008-11).
47. Simunovic, J., and **Swartzel, K. R.** 2007. *Investigation of a non-contact detection system (sensor implants and detector arrays) for determination of cooking and sterilization state of microwave-treated pre-packaged foods and biomaterials* (Center for Advanced Processing and Packaging Studies – \$9,928 November 2006 to November 2007).
48. CAPPS *Industrial memberships* –transferred to Dr. K.P. Sandeep with the transfer of the site- director responsibilities-04/01/07.
49. CAPPS, *NCSU-Site administrative support*- transferred to Dr. K.P. Sandeep with the transfer of the site-director responsibilities. 4/01/07
50. Sandeep, K.P., and A. Kuznetsov, J. Simunovic and **K.R. Swartzel**. *Mathematical Modeling and Experimental Validation of Continuous Flow Microwave Heating of Liquid Foods*. USDA-NRI. \$169,000. 09/01/2003-08/31/2006. (no cost extension to 08/31/07)
51. Peretti, S., A. Hobbs, S. Kelley, **K.R. Swartzel** and S. Kalland. *Screening plant for feedstock evaluation relative to biofuels production*. \$1.5 million. 2008. N C Golden Leaf Foundation.
52. Peretti, S., S. Kelley and **K.R. Swartzel**. *NC State site for the multi-site NSF I/UCRC Center for Bioenergy R&D*. NSF \$ 265,005. 09/01/08-08/31/2013.
53. Peretti, S., S. Kelley and **K. Swartzel**. *Center for Bioenergy R&D Industrial memberships*. 2008-2009-NC State site-\$250,000; five university center

- membership funding--\$1,250,000.
54. Peretti, S., S. Kelley, **K. Swartzel** and S. Kalland. *Center for Integrated Biomass Research* DOE. \$1,000,000. 2008-2009.
  55. Simunovic, J. and **K.R. Swartzel**. *Development of indicator arrays for cold-spot determination and time-temperature estimation*. CAPPs. \$55,559. 01/01/05-07/31/08.
  56. Sandeep, K.P., J. Simunovic, **K.R. Swartzel**, K. Harris, Ilenys Perez-Diaz, Continuous flow microwave processing of acid and low-acid foods. 12/01/2011-11/30/2014, \$495,038.USDA-NIFA.
  57. Sandeep, K.P. and **K.R. Swartzel**. CAPPs-NSF 5 year supplement funding for graduated Centers. 02/01/2010-01/31/2015. \$73,314.
  58. Peretti, S., **K.R.Swartzel**, S. Kelley, S. Kalland, and C. Furiness. *Integrated Biomass Refining Institute at North Carolina State University*. DOE. \$3,192,405 07/30/2008-03/31/2013.
  59. Simunovic,J.,D. Truong, **K.R. Swartzel**, T. Sanders. *CALS and FBNS equipment grant-5 kW Microwave generator, Micodry,Inc*. CALS-\$12,000, FBNS-\$5,000. Six investigators in FBNS will contribute the remainder of the \$34,000 price.
  61. Perretti, S., S. Kelley and **K.R. Swartzel**. Site funding for the Center for Bioenergy R&D (CBRD). NSF \$ 305,809--09/01/08-08/31/2013.
  62. Perretti, S., S. Kelley and **K.R. Swartzel**. Industrial Memberships to the NCSU Site I/UCRC CBRD. \$250,000. 10/01/09-09/30/2010, \$250,000, 10/01/2010-09/30/2011, \$250,000,10/01/2011-09/30/2012, \$250,000, 10/01/2012-09/30/2013.
  63. Gray, Denis. NSF IUCRC Evaluation Project. *Developing Scientific and Technological Leadership and Human Capital: Impact of IUCRC Directorship on Career Paths and Achievement*. **K.R. Swartzel**, Senior Group Member. NSF. 2009-2010, \$136,496.
  64. Green, D,-PI, DHHS. Building a stronger bridge in acidified food products training and certification. Advisor and aseptic subject instructor. 09/21/2011-08/31/2013, \$871,514.
  65. Swartzel, K.R. USDA-NIFA, *FSLI Scholarship support*-\$51,000 (2012-13)
  66. Instrumental in establishing Aseptia, Inc, Master Research Agreement with NCSU. 2016. (\$400,000+)
  67. *Major equipment donations have been secured from industry associated with aseptic processing and packaging studies (>\$5 million).*
  68. Swartzel, K.R. 2018. Enhancing the Integration of Enterprising Activities into Teaching and Research Agendas in CALS. Expense and stipend support for one individual – In Review.

69. Swartzel, K.R. 2019. Enterprising Culture within the University Units. NC State Office of the VC of Research. \$24K. In Review.

## PUBLICATIONS

1. Hansen, A.P., **K.R. Swartzel** and R.R. Earley. 1980. Effect of UHT processing and storage on the chemical and physical properties of UHT milk. Proceedings, International Conference on UHT processing and aseptic packaging of milk and milk products. NCSU.
2. Hansen, A.P., **K.R. Swartzel** and F.G. Giesbrecht. 1980. Effect of temperature and time of processing and storage on consumer acceptability of ultra-high-temperature steam injected whole milk. *J. Dairy Sci.* 63:187.
3. **Swartzel, K.R.**, A.P. Hansen and W.F. McClure. 1980. Relationship of absorbance to process treatments and flavor during storage of ultra-high-temperature dairy products. *J. Dairy Sci.* 63:1039.
4. **Swartzel, K.R.** and V.A. Jones. 1980. Fail-safe requirements for holding tube pressure in an ultra-high-temperature steam injection system. *J. Dairy Sci.* 63:1802.
5. **Swartzel, K.R.**, D.D. Hamann and A.P. Hansen. 1980. Rheological behavior of ultra-high-temperature steam injected dairy products on aging. *J. Fd. Proc. Eng.* 3:143-159.
6. **Swartzel, K.R.**, D.D. Hamann and A.P. Hansen. 1980. Rheological modeling of UHT milk gels using a cone and plate creep-relaxation test. *J. Fd. Proc. Eng.* 3:161-174.
7. **Swartzel, K.R.**, D.D. Hamann and A.P. Hansen. 1980. Rheological properties of aged aseptic ice cream mix and melt. *J. Texture Studies* 11:367-377.
8. Hansen, A.P. and **K.R. Swartzel**. 1981. Taste panel testing of UHT fluid dairy products. *J. Fd. Quality* 4:3.
9. Hamann, D.D., V.A. Jones and **K.R. Swartzel**. 1981. Textbooks for food engineering. *Agricultural Engineering* 11:13.
10. **Swartzel, K.R.** 1982. Arrhenius kinetics as applied to product constituent losses in ultra-high-temperature processing. *J. Fd. Sci.* 47:1886-1891.
11. Biziak, R.B., **K.R. Swartzel** and V.A. Jones. 1982. Energy evaluation of an ultra-high-temperature shell-and-tube processing system. *J. Fd. Sci.* 47:1875-1878.
12. Kawanari, Masami, D.D. Hamann, **K.R. Swartzel** and A.P. Hansen. 1981. Rheological and texture studies of butter. *J. Texture Studies* 12:483-505.
13. **Swartzel, K.R.** 1983. A method for predicting gelation of aseptically packaged steam injected UHT milk. *J. Fd. Sci.* 48:1376-1377.
14. **Swartzel, K.R.** 1983. Tubular heat exchanger fouling by milk during ultra-high-temperature processing. *J. Fd. Sci.* 48:1507-1511.
15. **Swartzel, K.R.** 1983. The role of heat exchanger fouling in the formation of sediment

- in aseptically processed and packaged milk. *J. Fd. Proc. and Pres.* 7:247-257.
16. Biziak, R.B., **K.R. Swartzel** and V.A. Jones. 1983. Aseptic fluid food processing-energy considerations. *ASAE Food Engineering News* 11:4-5.
  17. Hamid-Samimi M.H. **K.R. Swartzel** and H.R. Ball. 1984. Flow behavior of liquid whole egg during thermal treatments. *J. Fd. Sci.* 49:132-136.
  18. Ramsey, J.A. and **K.R. Swartzel**. 1984. Effect of ultra-high-temperature processing and storage conditions on rates of sedimentation and fat separation of aseptically packaged milk. *J. Fd. Sci.* 49:257-262.
  19. **Swartzel, K.R.** 1984. A continuous flow procedure for kinetic data generation. *J. Fd. Sci.* 49:803-806.
  20. Hamid-Samimi, M.H. and **K.R. Swartzel**. 1984. Pasteurization design criteria for production of extended shelf-life refrigerated liquid whole egg. *J. Fd. Proc. and Pres.* 8:219-224.
  21. Hamid-Samimi, M.H. and **K.R. Swartzel**. 1985. Maximum change in physical and quality parameters of fluid foods during continuous flow heating. Application to liquid whole egg. *J. Fd. Proc. and Pres.* 8:225-238.
  22. **Swartzel, K.R.** 1985. Food manufacturing - aseptic processing and packaging. McGraw-Hill Yearbook of Science and Technology. New York, pp. 195-197.
  23. Biziak, R.B., **K.R. Swartzel** and V.A. Jones. 1985. Energy use for continuous thermal processing of milk by direct and indirect methods. *J. Fd. Sci.* (50:1607-1610 & 1614).
  24. **Swartzel, K.R.** and V.A. Jones. 1985. Systems design and calibration of a continuous flow apparatus for kinetic studies. *J. Fd. Sci.* 50:1203-1204.
  25. Hawran, L.J., V.A. Jones and **K.R. Swartzel**. 1985. Sediment formation in aseptically processed and packaged milk. *J. Fd. Proc. and Pres.* 9:189-207.
  26. McGuire, J., **K.R. Swartzel** and D.E. Guinnup. 1985. Measuring substrata influences on biofouling. *In: Fundamentals and Application of Surface Phenomena Associated with Fouling and Cleaning in Food Processing Proceedings of the Second International Workshop on Fouling and Cleaning in Food Processing.* Ed. by D. Lund, E. Plett and C. Sandu, pp. 168-177, Univ. of Wisconsin-Madison.
  27. **Swartzel, K.R.** 1985. The impact of aseptic processing and packaging technology on the dairy industry. *Dairy Research Review* Vol. 1 No. 3. National Dairy Council, Rosemont, IL.
  28. **Swartzel, K.R.** 1985. Generation, interpretation, and use of kinetic data in the design and evaluation of aseptic systems. *In Sym. Proceeding of the IUFOST Symposium on Aseptic Processing and Packaging of Foods*, Tylosand, Sweden. Univ. of Lund, Sweden.
  29. Hamid-Samimi, M.H., **K.R. Swartzel** and H.R. Ball, Jr. 1985. Aseptic Packaging of Ultra- Pasteurized Egg. Design and Economic Considerations. *In Symposium*

- Proceeding of the IUFoST Symposium on Aseptic Processing and Packaging of Foods, Tylosand, Sweden. Univ. of Lund, Lund, Sweden.
30. **Swartzel, K.R.** 1986. An equivalent point method for thermal evaluation of continuous flow systems. *J. of Agri. and Fd. Chem.* 34:396-401.
  31. Sadeghi, F., M.H. Hamid-Samimi and **K.R. Swartzel**. 1986. Micro-computer program for determining the unique time-temperature associated with the equivalent point method of thermal evaluation. *J. Fd. Proc. and Pres.* 10:331-335.
  32. Rakes, P.A., **K.R. Swartzel** and V.A. Jones. 1986. Deposition of dairy-containing fluids on heat exchange surfaces. *Biotechnology Progress.* 2:210-217.
  33. Rakes, P.A., M.H. Hamid-Samimi and **K.R. Swartzel**. 1987. Long-term storage of aseptically processed and packaged dairy fluids. *J. Fd. Quality.* 10:35-41.
  34. Ball, Jr. H.R., Hamid-Samimi, M.H., Foegeding, P.M. and **K.R. Swartzel**. 1987. whole egg. *J. Fd. Sci.* 52:1212-1218.
  35. McGuire, J. and **K.R. Swartzel**. 1987. On the use of water in the measurement of solid surface tension. *Surface and Interface Analysis.* 10:430-433.
  36. **Swartzel, K.R.** and D.O. Gray. 1987. Industry-University cooperative research centers in agriculture and food science: Center for aseptic processing and packaging studies. *J. Fd. Tech.* 44:96-98.
  37. **Swartzel, K.R.** 1988. The profitability of understanding kinetics associated with aseptic processing and packaging studies. Fifth International Conference on Aseptic Packaging. ASEPTIPAK. Scotland Business Research, Princeton, N.J.
  38. **Swartzel, K.R.** 1988. Innovations in aseptic processing and packaging. Proceedings, In New Technologies for the Food Industry. Monterey Seminar Group, San Jose, California.
  39. **Swartzel, K.R.** 1988. Non-isothermal kinetic data generation for food constituents. In Food Properties and Computer-Aided Engineering of Food Processing Systems. Ed. by Paul Singh and A. Medina. Kluwen Academic Publishers, London. p. 99-103.
  40. Rhim, J.W., V.A. Jones and **K.R. Swartzel**. 1988. Initial whitening phenomena of skim milk on heating. *Lebensmittel-Wissenschaft and Technologies.* 21:339-341.
  41. Rhim, J.W., V.A. Jones and **K.R. Swartzel**. 1988. Kinetic studies in the color changes of skim milk. *Lebensmittel-Wissenschaft and Technologies.* 21:334-338.
  42. Rhim, J.W., R.V. Nunes, V.A. Jones, and **K.R. Swartzel**. 1989. Appearance of a kinetic compensation effect in the acid-catalyzed hydrolysis of disaccharides. *J. Fd. Sci.* 54(1):222-223.
  43. McGuire, J. and **K.R. Swartzel**. 1989. The influence of solid surface energetics on macromolecular adsorption from milk. *J. of Fd. Proc. and Pres.* 13:145-160.
  44. Rhim, J.W., R.V. Nunes, V.A. Jones and **K.R. Swartzel**. 1989. Determination of kinetic parameters using linearly increasing temperature. *J. Fd. Sci.* 52(2):446-450.
  45. Oamen, E.E., A.P. Hansen, and **K.R. Swartzel**. 1989. Effect of ultra-high-temperature

- steam injection processing and aseptic storage on labile water-soluble vitamins in milk. *J. Dairy Sci.* 72:614-619.
46. Rhim, J.W., R.V. Nunes, V.A. Jones, and **K.R. Swartzel**. 1989. Kinetics of color change of grape juice generated using linearly increasing temperature. *J. Fd. Sci.* 54(3): 776-777.
  47. Nunes, R.V. and **K.R. Swartzel**. 1990. Modeling chemical and biochemical changes under sinusoidal temperature fluctuations. *J. of Fd. Eng.* 11:119-132.
  48. Nunes, R.V. and **K.R. Swartzel**. 1990. Modeling thermal processes by using the equivalent point method. *J. of Fd. Eng.* 11:103-117.
  49. Sadeghi, F. and **K.R. Swartzel**. 1990. Generating kinetic data for use in design and evaluation of high temperature food processing systems. *J. Fd. Sci.* 55:851-853.
  50. Rhim, J.W., V.A. Jones and **K.R. Swartzel**. 1990. Kinetic compensation of heat denaturation of whey proteins. *J. Fd. Sci.* 55:589-590 and 592.
  51. Kumar, A. and **K.R. Swartzel**. 1990. Supercomputing applications in thermal processing operations for foods *In Science and Engineering on Supercomputers*. Computational Mechanics Publications. Southampton, UK. p. 81-90, 571-572.
  52. Sadeghi, F. and **K.R. Swartzel**. 1990. Time-temperature equivalence of discrete particles during thermal processing. *J. Fd. Sci.* 55:1696-1698 and 1739.
  53. Schwartz, S.J., **K.R. Swartzel** and J.B. Giles. 1991. The center for aseptic processing and packaging studies -An overview. *In*. Proceeding, News In Aseptic Processing and Packaging, Technical Research Centre of Finland (VTT), Helsinki, Finland, pp. 17-20.
  54. Nunes, R.V., J.W. Rhim, and **K.R. Swartzel**. 1991. Kinetic parameter evaluation with linearly increasing temperature profiles: Integral methods. *J. Fd. Sci.* 56:1433-14.
  55. Yang, B. B. and **K.R. Swartzel**. 1991. Photo-sensor methodology for determining residence time distributions of particle in continuous flow thermal processing systems *J. Fd. Sci.*56:1076-1081, 1086.
  56. **Swartzel, K.R.** 1991. Industry/university cooperative research centers. *IFT Food Engineering Newsletter* 16:1.
  57. **Swartzel, K.R.** and A. Kumar. 1991. Use of super computers in modeling food processing systems. *IFT Food Engineering Newsletter* 16:2.
  58. Kumar, A., J. Blalock, and **K.R. Swartzel**. 1991. Modeling thermal and aseptic processes of foods using FIDAP. *In*: Proceedings of the Fourth FIDAP Users Conference. Guild Dynamics Int. Evanston, IL.
  59. Kumar, A. and **K.R. Swartzel**. 1991. User News: Researchers explore food processing applications. *In* CRAY CHANNELS--Cray Research, Inc., Mendota Heights, MN 12:3, p. 26-27.
  60. Foegeding P.M. and **Swartzel, K.R.** 1991. Past successes and new challenges for the Center for Aseptic Processing and Packaging Studies at North Carolina State University. *In*: Proceedings of the 1991 Food Development and Marketing USA Conference. FPM



Group, Inc. Oak Park, ILL.

61. **Swartzel, K.R.** and J.J. Miles. 1991. Advances in aseptic processing of particulate foods. Activities Report. Research and Development associates for Military Food and Packaging Systems, Inc. 43:3.
62. Yang, B. Barry and **K.R. Swartzel**. 1992. Particle residence time distributions in two-phase flow in straight round conduit. *J. Fd. Sci* 57:497-502.
63. Yang, B. Barry, R.V. Nunes and **K.R. Swartzel**. 1992. Lethality distribution within particles in the holding section of an aseptic processing system. *J. Fd. Sci.* 57:1258-1265.
64. **Swartzel, K.R.** and S.J. Schwartz. 1992. Aseptic processing and packaging--issues and technology. Perspectives in Food Science and Technology--Aseptics. Elsevier Applied Science Publishers.
65. Pastrana, J.F., H.J. Gold and **K.R. Swartzel**. 1992. Computerized specification of a unified model for the heat transfer processes that occur during canning, SSHE aseptic and ohmic processing of food products with large particles. North Carolina State University. Institute of Statistics Mimeo Series. No. 2214. Biomathematics Series No.37.
66. Pastrana, J.F., H.J. Gold and **K.R. Swartzel**. 1992. Unified Model for the Heat Transfer Processes that Occur During Canning, SSHE Aseptic, and Electric Resistance Aseptic Processing for Particulate-Laden Products. North Carolina State University. Institute of Statistics Mimeo Series. No. 2230. Biomathematics Series 36.
67. Pastrana, J.F., H.J. Gold and **K.R. Swartzel**. 1992. Escogencia Del Sistema De Proesa Miento Para Un Producto Alimenti Cio, Aplicando la metodolgia Del Analysis De Decisiones. Journada de Analisis Estadistico de Patos Laboratorio De Investigacion y Consultoria Estadistica Escueta De Estadistica, Universidad De Costa Rica.
68. Kumar, A. and **K.R. Swartzel**. 1993. Process Engineering: Food Canning and Sterilization. In Engineering Design and Analysis Chapter of Supercomputing and Transformation of Science Scientific American Library ed. by W.J. Kaufmann III and L.L. Smarr. New York.
69. **Swartzel, K.R.** Ultra-High Temperature (UHT) Treatments. 1993. In: Encyclopedia of Food Science, Food Technology and Nutrition. Harcourt Brace Jovanovich Limited, London.
70. Kumar, A. and **K.R. Swartzel**. 1993. Selected food engineering problems and their solutions through FEM. The American Society of Mechanical Engineers, FED-Vol. 171, eds. Dhaubhadel, Engelman and Habashi, Book No. H00847, p. 107-113
71. Miles, J.J. and **K.R. Swartzel**. 1993. Continuous flow kinetic data generation for aseptic processes. In: Proceedings of the International Symposium on Aseptic Processing and Packaging Technology for Prepared Foods . Hsinchu, (FIRDI), Taiwan, ROC.
72. Nunes, R.V., **K.R. Swartzel** and D.F. Ollis. 1993. Thermal evaluation of food processes: The role of a reference temperature. *J. Fd. Engr.* (20); 1-15

73. **Swartzel, K.R.** and J.B. Giles. 1993. The center for aseptic processing and packaging studies  
- An industry/university cooperative research center. In: proceedings of the International Symposium on Aseptic Processing and Packaging Technology for Prepared Foods. Hsinchu, (FIRDI), Taiwan, ROC.
74. **Swartzel, K.R.** and A. Kumar. 1993. The equivalent point method for thermal evaluation-- Applications to aseptic processing. In proceedings of the International Symposium on Aseptic Processing and Packaging Technology for Prepared Foods. Hsinchu, (FIRDI), Taiwan, ROC.
75. Fairchild, T.M., **K.R. Swartzel**, and P.M. Foegeding. 1994. Inactivation kinetics of *Listeria innocua* in skim milk in a continuous flow processing system. J. Fd. Sci. 59(5): 960-963.
76. Martinez, R.M., P.L. Dawson, H.R. Ball, Jr., **K.R. Swartzel**, S.E. Winn and F.G. Giesbrecht. 1995. The effects of ultrapasteurization with and without homogenization on some chemical, physical and functional properties of aseptically packaged liquid whole egg. J. Poultry Sci. 74:742-752.
77. Miles, J.J. and **K.R. Swartzel**. 1995. Evaluation of continuous thermal processing using thermocouple data and calibrating reactions. J. Fd. Process Eng. 18:99-113.
78. Miles, J.J. and **K.R. Swartzel**. 1995. Development of sucrose inversion kinetics under conditions of continuous flow. J. Fd. Quality 18:369-378.
79. **Swartzel, K. R.** 1995. Aseptics - Yesterday, Today and Beyond. In Proceedings of the International Symposium on Advances in Aseptic Processing and Packaging Technologies. Thomas Ohlsson (ed.) SIK, Goteborg, Sweden.
80. Williams, C.K., R.W. Hamaker, S.G. Ganesan, R.T. Kuehn, **K.R. Swartzel** and J. O'Sullivan. 1995. Low temperature diffusion of Alkalie earth cations in thin vitreous SiO<sub>2</sub> films. J. Electro-Chem. Soc. 142(1):303-311.
81. Kumar, A., R.V. Nunes, and **K.R. Swartzel**. 1996. A novel method for kinetic parameter estimation for nonisothermal heating in aseptic processing temperature range. In: Proceedings of the 1993 Food 2000 Preservation Conference, Vol. I, Science and Technology Corp. Natick, MA, p. 75-89.
82. Lechowich, R.V. and **K.R. Swartzel**, Eds. 1996. Aseptic Processing of Multiphase Foods. Pub. by the National Center for Food Safety and Technology, Summit-Argo, IL and the Center for Aseptic Processing and Packaging Studies, Raleigh, NC and the University of California-Davis, 26 pp.
83. Lee, H.G. and **K.R. Swartzel**. 1997. Enthalpy-entropy Compensation for a glucose-lysine maillard Reaction. Fd. Engr. Progress 1(2):113-116
84. **Swartzel, K.R.** 1997. The Time is Now for the U.S. to Capitalize on Aseptic Processing and Packaging of Particulate Foods. In: Proceedings of the 1997 Conference on Food Engineering. AIChE, New York, NY.
85. **Swartzel, K.R.** 1997. Past and Present Challenges for Aseptics. In proceedings of the

- International Symposium Advances in Aseptic Processing and Packaging Technologies. Food Industry Research and Development Institute, Hsinchu, Taiwan.
86. **Swartzel, K.R.** 1997. Future Challenges and New Markets for Aseptics. In: proceedings of the International Symposium Advances in Aseptic Processing and Packaging Technologies. Food Industry Research and Development Institute, Hsinchu, Taiwan.
  87. **Swartzel, K.R.** 1998. Treatment of University Intellectual Property. In: Proceedings of the Technology Transfer Forum. Mississippi State University, Starksville, MS.
  88. Simunovic, J. and **Swartzel, K. R.** 1998. Methods and systems for residence time measurement of particles in continuous thermal bioprocessing. In: Automatic Control of Food and Biological Processes. SIK, Goteborg, Sweden.
  89. Kyereme, M., **K.R. Swartzel** and B.E. Farkas. 1999. New line intersection procedure for the equivalent point method of thermal evaluation. *J. of Fd. Sci.* 64:565-570.
  90. Shefet, S.M., B.W. Sheldon, B.E. Farkas and **K.R. Swartzel.** 1999. Development of a quantitative video- based visualization method to characterize the flow behavior of food particulates in a model continuous aseptic sterilizer. *J. Fd. Process Engineering.* 22:141-160.
  91. Larkin, J. and **K.R. Swartzel,** Editors. 1999. Practical Innovations in Aseptic processing and packaging II. Society of Manufacturing Engineers, Dearborn, MI. 87 pg.
  92. **Swartzel, K.R.** 2000. Engineering the Future. Food Technology Backpage. *Food Technology* 54:246.
  93. **Swartzel, K.R.** 2000. Heat treatment (a) Ultra-high temperature (UHT) treatments. In *Encyclopedia of Food Sciences and Nutrition.* B. Caballero, L. Trugo and P. Finglas, eds. Academic Press, London.
  94. Rhim, J.W., V. A. Jones and **K.R. Swartzel.** 2002. Texture degradation kinetics of sweet potatoes during heat treatment. *Journal of Food Science and Biotechnology*(a Korean journal printed in English). Vol.11, No. 1, pp.29-33.
  95. Swartzel, K. R. 2001. Forward. Introduction to Food Engineering, authored by R.Paul Singh and D.R. Heldman, Academic Press, London.
  96. **Swartzel, K.R.** 2002. Challenges for the Process Specialist in the 21<sup>st</sup> Century. In: *Engineering and Food for the 21<sup>st</sup> Century.* Editors , J.Welti-Chanes, G. Barbosa-Canovas and J. Miguael Aguilera. CRC Pub. Co.
  97. **Swartzel, K.R.** 2003. Ultra-High Temperature (UHT) Treatments. *Encyclopedia of Food Science & Nutrition.* Elsevier Science Ltd. London.
  98. Boldor, D., T.H. Sanders, **K.R. Swartzel** and J. Simunovic.2002. Computer-assisted color classification of peanut pods. *Peanut Science.* 29:41-46.
  99. Zhong, Q., K.P. Sandeep and K. R. Swartzel. 2003. Continuous flow radio freq. heating of water and carboxymethylcellulose solutions. *JFS.* 68: 217-223.

100. Boldor, D., T.H. Sanders, **K.R. Swartzel** and J. Simunovic. 2002. Computer-assisted or classification of peanut pods. *Peanut Science*. 29:41-46.
101. Zhong, Q., K.P. Sandeep and K. R. Swartzel. 2003. Continuous flow radio freq. heating of water and carboxymethylcellulose solutions. *JFS*. 68: 217-223.
102. Zhong, Q., K.P. Sandeep and K. R. Swartzel. 2003. Continuous flow radio freq. heating of particulate foods. *Innovative Food Science & Emerging Technologies*. 5:4, 475-483.
103. Sandeep, K.P., Simunovic, J., **Swartzel, K.R.** 2004. Developments in aseptic processing. In *“Improving thermal processing”*, Woodhead Publishing Limited. pp. 177-187.
104. Heldman, D.R., T.P. Labuza, **K.R. Swartzel**, A.S. Clausi, S.S. Rivi, and J. L. Kokini. 2004. Identifying Food Science Technology Research Needs. *Food Technology*. 58:12, 32-34.
105. Riemann, AE, Lanier TC, Swartzel KR. 2004. Rapid heating effects on gelation of muscle proteins. *Journal of Food Science*. 69(7): E308-E314
106. Boldor, D., T.H. Sanders, **K.R. Swartzel** and B.E. Farkas. 2005. A model for temperature and moisture distribution during continuous microwave drying. Accepted for publication to the *J. of Food Process Engineering*. Vol. 28, pp 68-87
107. Boldor, D., Sanders, T. H., Swartzel, K. R., and Simunovic, J. 2006. Thermal profiles and moisture loss during continuous microwave drying of peanuts. *Peanut Science* 14:21-35.
108. Brinley, T. A., C.N. Stam, V.-D. Truong, P. Coronel, P. Kumar, J. Simunovic, K.P. Sandeep, G.D. Cartwright, **K.R. Swartzel** and L.-A. Jaykas. 2007 Feasibility of utilizing bio-indicators for testing microbial inactivation in sweet potato puree processed with continuous microwave system. . Vol. 72(5): E235-E242.
109. Kumar, P., Coronel, P., Truong, V.D., Simunovic, J., **Swartzel, K.R.**, Sandeep, K.P., and Cartwright, G. 2007. Overcoming issues associated with the scale-up of a continuous flow microwave system for aseptic processing of vegetable purees. *Food Research International*. Vol. 41: 454-461.
110. **Swartzel.K.R.** Solid Waste-Food, Food Packaging & Storage Issues. In: Final Report- A workshop on Technology Approaches to Current and Future Base Camp Sustainability (Proposal # 52949-EV-CE). Editors: C.S.Brown, H. Janes, and C. Martin-Brennan. Habitation Institute. [http://www.ncsu.edu/kenan/ncsi/aro\\_base.html](http://www.ncsu.edu/kenan/ncsi/aro_base.html). January 11, 2008.
111. Jasrotia, A, K. S., Simunovic, J., Sandeep, K. P., Palazoglu, T. K., **Swartzel, K. R.** 2008. Design of Conservative Simulated Particles for Validation of a Multiphase Aseptic Process. *Journal of Food Science* 73 (5), E193–E202
112. Steed, L.E., Truong, V.D., Kumar, P., Simunovic, J., Cartwright, G.D., **Swartzel. K.R.** 2008. Continuous Flow Microwave-assisted aseptic processing and aseptic packaging of purple-fleshed sweetpotato purees. *J.of Fd Science*. Volume 73, Issue 9, pages E455–E462.

113. Fernandez, C., **Swartzel, K.R.** 2008. Major Changes at MajorState University: Challenges for Administrative Leaders in the School of Agriculture I. Food Systems Leadership Institute, Case Study, Raleigh.
114. Kumar, P., Simunovic, J., Truong, V.D., **Swartzel, K.R.**, Cartwright, G.D., Sandeep, K.P. 2009. Temperature distributions and dielectric properties of vegetable purees under continuous flow microwave heating. IFT Paper No. 225-28.
115. Fernandez.C, **Swartzel, K.R.** 2009. Power and Persuasion at MajorState University: Challenges for Administrative Leaders in the School of Agriculture II. Food Systems Leadership Institute, Case Study, Raleigh.
116. **Swartzel, K.R.** and Claudia Fernandez. 2009. Major Challenges at MajorState University, The College of Agriculture Restructuring Proposal III. Food Systems Leadership Institute, Case Study, Raleigh.
117. Sandeep, K.P., J. Simunovic and **K.R. Swartzel.** 2010. Development in Aseptic Processing In: Improving Thermal Processing edited by Philip Richardson. Wood head Publishing, Cambridge, U.K.
118. Kumar, P., Simunovic, J., **Swartzel, K.R.** 2010. Aseptic processing and packaging. In: Heldman, D.R., Moraru, C. Editors. *“Encyclopedia of agricultural, food, and biological engineering”*. 2<sup>nd</sup> ed. CRC Press LLC, Boca Raton, FL. pp 87-90.
119. **Swartzel, K.R.** 2011. Advanced Meal Processing and Preparation. Proceeding of the 11<sup>th</sup> International Conference on Engineering and Food. Athens, Greece.
120. **Swartzel, K.R.** 2012. Advanced Meal Processing and preparation (AFT74) published in Proceeding of the 11<sup>th</sup> International Congress on Engineering and Foods, Athens, Greece. National Technical University of Athens, and through Science Direct and Scopus.
121. Coronel, P. J. Simunovic, **K.R. Swartzel.** 2012. *Aseptic Processing of Particulate Foods- an industry Perspective*, In: Handbook of Aseptic Processing and Packaging, Second Edition Edited by David, J., R. Graves, and Thomas Szemplenski. CRC Press. Released 11/19/2012.
122. **Swartzel, K.R.**, C. S. P. Fernandez, and C. Reilly. Food Systems Leadership Institute. 2013. Food Technology.
123. **Swartzel, K.R.** 2014, Intellectual Property, Commercialization, and a Professor’s Career. Inside Higher Education, web based news and interest site. <https://fbns.ncsu.edu/faculty-directory/kenneth-r-swartzel/>
124. **Swartzel, K.R.** 2016. History of the Department of Food Science. (1961-2015). North Carolina State University Communications. , Department of Food Bioprocessing and Nutrition Sciences.
125. **Swartzel, K.R.** 2021. University Unwritten Rules for a Successful Academic Career.

*Academia Letters* Article 572.

126. **J. Simunovic and K.R. Swartzel.** 2022. Food Processing for Today and Tomorrow. Volume 52.Number 2 Summer Edition **The Bridge**. National Academy of Engineering.pp.48-52.
127. **K.R. Swartzel.** 2023. Forward for Handbook of Aseptic Processing and Packaging, 3rd Edition. Edited by Jairus R. D. David, Pablo M. Coronel, Josip Simunovic. CRC Press. ISBN 9780367724801.

## ANNUAL REPORTS

1. 1986-2002-NSF I/UCRC Center for Aseptic Processing and Packaging Studies Annual Reports.
2. 1993-2004-Department of Food Science Annual Reports.
3. 2004-2012-Kellogg/APLU Food Systems Leadership Institute Annual Reports.
4. 2008-2015-Center for Bioenergy R&D (CBERD), Co-PI-contribution to the Annual Reports.
5. 1980-2015-Faculty Activity Reports in addition to the annual Program Impact Statements.

## US ISSUED PATENTS

1. **Swartzel, K.R.**, M.H. Hamid-Samimi and H.R. Ball, Jr. 1989. Method for the ultrapasteurization of liquid whole egg products. U.S. Patent No. 4,808,425.
2. **Swartzel, K.R.**, M.H. Hamid-Samimi and H.R. Ball, Jr. 1990. Method for the ultrapasteurization of liquid whole egg products. U.S. Patent No. 4,957,759.
3. **Swartzel, K.R.**, H.R. Ball, Jr. and J. Liebrecht. 1990. Ultrapasteurization of liquid whole egg products with direct heat. U.S. Patent No. 4, 957,760.
4. **Swartzel, K.R.**, H.R. Ball, Jr., and M.H. Hamid-Samimi. 1991. Method for the ultrapasteurization of liquid whole egg products. U.S. Patent No. 4,994,291.
5. **Swartzel, K.R.**, H.R. Ball, Jr. 1991. Method for pasteurizing liquid whole egg. U.S. Patent No. 5,019,407.
6. **Swartzel, K.R.**, H.R. Ball, Jr. and M.H. Hamid-Samimi. 1991. Method for the ultrapasteurization of liquid whole egg products. U.S. Patent No. 5,019,408.
7. **Swartzel, K.R.**, G.S. Ganesan, D. Kuehn, R. Hamaker and F. Sadeghi. 1991. Thermal memory cell for thermal system evaluation. U.S. Patent No. 5,021,981.
8. **Swartzel, K.R.** and H.R. Ball, Jr. 1992. Apparatus for pasteurizing liquid whole egg products. U.S. Patent No 5,105,724.
9. **Swartzel, K.R.**, G.S. Ganesan, D. Kuehn, R. Hamaker and F. Sadeghi. 1992. Thermal Memory Cell and thermal system evaluation. U.S. Patent No. 5,159,564.
10. Hamid-Samimi, M.H., **K.R. Swartzel** and H.R. Ball, Jr. 1997. Method for the pasteurization of egg products using radio waves. U.S. Patent No. 5,612,076.
11. **Swartzel, K.R.** and S. Palaniappan. 1997. Method for Pasteurizing Liquid Whole Egg Products. U.S. Patent No. 5,670,199.

12. **Swartzel, K.R.** and Josip Simunovic. 1999. Method and system for residence time measurement of simulated food particles in continuous thermal food processing and simulated food particles for use in same. U.S. Patent No. 5,932,813.
13. **Swartzel, K.R.** and Simunovic, J. 2000. Method for conservatively evaluating continuous thermal treatment process for a particulate-containing food product stream. U.S. Patent No.6,015,231.
14. **Swartzel, K.R.**, H.R. Ball, Jr. and M.H. Hamid-Samimi. 2001. Method for the ultrapasteurization of liquid whole egg products. U.S. Reissue Patent #37,225.
15. Hamid-Samimi, M., **K. R. Swartzel** and H. R. Ball, Jr. 2002. Method for the pasteurization of egg products using radio waves. U.S. Patent No.6,406,727.
16. **Swartzel, K. R.**, and J. Simunovic. 2003.Plurality of particles made of a detectable magnetic implant and carrier in combination with a plurality of magnetic field sensors. U. S. Patent No. 6,536,947.
17. **Swartzel, K.R.**, and J. Simunovic. 2004. System for measuring residence time for a particulate containing food product. U.S. Patent No. 6,766,699.
18. Simunovic, J., **K.R. Swartzel**, and Eric Adles. 2004. Method and system for conservative evaluation, validation and monitoring of thermal processing. U.S. Patent No. 6,776,523.
19. Simunovic, J., **K.R. Swartzel**, and Eric Adles. 2006. Method and system for conservative evaluation, validation and monitoring of thermal processing. U.S. Patent No. 7,004,620.
20. Palazoglu, T. K., Simunovic, J., **Swartzel K. R.** and Sandeep, K. P. 2006. Methods, systems, and device for evaluation of thermal treatment. US Patent No. 7,112,954.
21. Simunovic, J., **Swartzel, K. R.**, Adles, E. 2007. Method and system for conservative evaluation, validation and monitoring of thermal processing. U.S. Patent No. 7,213,967.
22. Lanier, T., Simunovic, J., **Swartzel K.R.**, Drozd, J.M., Riemann, A. 2007. Thermal Gelation of Foods and Biomaterials Using Rapid Heating. U.S. Patent No. 7,270,842.
23. Simunovic, J., **K.R. Swartzel**, V.D. Truong, G. Cartwright, P. Coronel, K.P.Sandeep, D.Parrott. 2014. Methods and apparatus for thermal treatment of foods and other biomaterials, and products obtained thereby. US patent no. 8,742,305 B2.
24. Simunovic, J., **K.R. Swartzel**, V.D. Truong, G. Cartwright, K.P. Sandeep D. Parrott, P. Coronel. 2017. Methods and apparatus for thermal treatment of foods and other biomaterials, and products obtained thereby. US patent # 9,615,593.

Fourteen patent applications are published and remain accessible through the USPTO.

Disclosures to the OTT that never became an application are not listed (15+)

#### **FOREIGH PATENTS ISSUED/PENDING/ OR ISSUED AND ABANDONED**

1. **Swartzel, K.R.**, G.S. Ganesan, D. Kuehn, R. Hamaker and F. Sadeghi. 1992. Thermal memory cell for thermal system evaluation. Taiwanese letters Patent No. NI-52949.

2. **Swartzel, K.R.**, G.S. Ganesan, D. Kuehn, R. Hamaker and F. Sadeghi. 1993. Thermal Memory Cell and thermal system evaluation. Australian Patent No. 635911.
3. **Swartzel, K.R.**, H.R. Ball, Jr. and M.H. Hamid-Samimi. 1993. Method and apparatus for pasteurizing liquid whole egg products. European Patent No. 5,051-115-2
4. **Swartzel, K.R.** and H.R. Ball, Jr. 1997. Method and Apparatus for Pasteurizing Liquid Whole Egg Products. Canadian Patent No. 2,073,867.
5. **Swartzel, K.R.** and Simunovic, J., 1999. Thermal Processor Measurement Using Simulated Food Particles. WO9918416A1 Issued April 15, 1999. Inter. Bureau of WIPO, Geneva, Switzerland.
- 6.. **Swartzel, K.R.** and Simunovic, J., 1999. Thermal Processor Measurement Using Simulated Food Particles. AU8593498A1, Issued April 29, 1999. Inpadoc Record, Commonwealth of Australia.
7. **Swartzel, K.R.** and Simunovic, J., 1999. Thermal Processor Measurement Using Simulated Food Particles. EP1019680A1, Issued July 19, 2000. European Patent Office.
- 8.. Simunovic, J., **K.R. Swartzel**, and Eric Adles. 2006. Method and system for conservative evaluation, validation, and monitoring of thermal processing. Mexican National Phase Application based No. 2,513,607 on PCT/US04/02335, issued 10/08/2008 as #261,193 and Australia application serial no. 2002301264.
9. Palazoglu, T.K., Simunovic, J., **Swartzel, K.R.**, Sandeep, K.P. Methods, systems, and devices for evaluation of thermal treatments. US published application US-2007-0018639-A1 (January 25, 2007); Australian # 2004208147; PCT international application # PCT/US04/02335; European Patent No. 1623048 issued March 5, 2014.
10. **Swartzel, K.R.** and Simunovic, J. Thermal processor measurement using simulated food particles. Mexican patent #241601 issued 10/31/2006, Australian patent application# 85934/98, issued as 2006200767, 08/07/2008; European application 98937153.9; Canadian patent application 2,305,738.
11. Simunovic, J., **Swartzel, K. R.**, Adles, E. 2007. Method and system for conservative evaluation, validation, and monitoring of thermal processing. Continuation in part of U.S. Patent No. 7,213,967. Mexican Divisional patent application PA/a/2005/012078-notice of allowance-9/8/08; Canadian patent application No. 2,402,648; notice of allowance, 01/15/2009.
12. **Swartzel, K.R.** and Simunovic, J. Thermal processor measurement using simulated food particles. Australian patent application #2006200767, issued July 24, 2008.
13. Simunovic, J., **Swartzel, K. R.**, Adles, E. 2007. Method and system for conservative evaluation, validation, and monitoring of thermal processing. Continuation in part of U.S. Patent No. 7,213,967. Published Mexican Divisional patent application-MX/a/2008/009607, July 25, 2008.
14. Simunovic, J., **K. R. Swartzel**, Truong, Van-Den, Cartwright. Coronel, P., Sandeep, K.P., and Parrott, D. Methods and apparatuses for thermal treatment of foods and other biomaterials, and products obtained thereby. Chinese patent #ZL200580038640.0. Issued June 2, 2010.



15. Simunovic, J., **K.R. Swartzel**, V.D. Truong, G. Cartwright, D. Parrott, P. Coronel, & K.P. Sandeep . Methods and apparatus for thermal treatment of foods and other biomaterials, and products obtained thereby. US patent application # 20110036246 A1, filed February 17, 2011.
16. Simunovic, J., **K. R. Swartzel**, and E. Adles. 2011. Method and System for Conservative Evaluation, Validation and Monitoring of Thermal Processing, Canadian Patent No.2,402,648 issued October 11, 2011.
17. Simunovic,J., **K.R. Swartzel**, V.D. Truong, G. Cartwright, P. Coronel, D. Parrott & K.P. Sandeep. 2011. Methods and apparatus for thermal treatment of foods and other biomaterials, and products obtained thereby. New Zealand Patent No. 553749, Issued December 5, 2011.
18. Simunovic,J., **K.R. Swartzel**, V.D. Truong, G. Cartwright, P. Coronel, D. Parrott & K.P. Sandeep. Methods and apparatus for thermal treatment of foods and other biomaterials, and products obtained thereby. Mexican application # 2007/003066-notice of allowance for 31 claims, November 6, 2012.
19. Simunovic, J., **K.R. Swartzel**, V.D. Truong, G. Cartwright, P. Coronel, D. Parrott & K.P. Sandeep. 2012. Methods and apparatus for thermal treatment of foods and other biomaterials, and products obtained thereby. Australian Patent No.20055304583 issued May 31, 2012.
20. Simunovic, J., **K.R. Swartzel**, V.D. Truong, G. Cartwright, P. Coronel, D. Parrott & K.P. Sandeep. 2013. Methods and apparatus for thermal treatment of foods and other biomaterials, and products obtained thereby. Canadian patent #2583856, issued August 6, 2013.
21. Simunovic, J., **K.R. Swartzel**, V.D. Truong, G. Cartwright, P. Coronel, D. Parrott & K.P.Sandeep. Methods and apparatus for thermal treatment of foods and other biomaterials, and products obtained Thereby. All claims allowed. Canadian patent application no. 2,812,925.
22. **Swartzel, K.R.** and Simunovic, J. Thermal processor measurement using simulated food particles. European Patent Application Serial No. 98937153.9, validated in Sweden, June, 2016.
23. Palazoglu, T.K., Simunovic, J., **Swartzel, K.R.**, Sandeep, K.P. Methods, systems and devices for evaluation of thermal treatments. Canadian Patent Application No. 2513607, officially allowed. February 24, 2016.
24. Simunovic, J., **K.R. Swartzel**, V.D. Truong, G. Cartwright, P. Coronel, D. Parrott & K.P. Sandeep. 2013. Methods and apparatus for thermal treatment of foods and other biomaterials, and products obtained thereby. European Divisional Patent Application No. 16182224.2, August 1, 2016.
25. Simunovic, J., **K.R. Swartzel**, V.D. Truong, G. Cartwright, P. Coronel, D. Parrott & K.P. Sandeep. 2013. Methods and apparatus for thermal treatment of foods and other biomaterials, and products obtained thereby. European Patent No. 1809565 granted on August 3, 2016.

## ABSTRACTS AND PRESENTATIONS

1. **Swartzel, K.R.**, V.A. Jones and A.P. Hansen. 1978. Pasteurization fail-safe requirements for holding- tube pressure in an ultra-high-temperature steam injection system. ADSA,

- East Lansing, MI.
2. Hansen, A.P. and **K.R. Swartzel**. 1978. Effect of process and storage conditions on flavor acceptability of sterile ultra-high-temperature steam injected whole milk. ADSA, East Lansing, MI.
  3. Jones, V.A., A.P. Hansen and **K.R. Swartzel**. 1978. Sterile-aseptic processing of ADSA, East Lansing, MI.
  4. **Swartzel, K.R.**, D.D. Hamann and A.P. Hansen. 1979. Rheological properties of aged ultra-high-temperature steam injected dairy products. Society of Rheology Golden Jubilee Meeting, Boston, MA.
  5. **Swartzel, K.R.** 1979. Ultra-high-temperature milk--A status report. NADSA Southern States Dairy Division, Asheville, NC.
  6. **Swartzel, K.R.**, A.P. Hansen and W.F. McClure. 1979. Optical density of UHT dairy products as a tool for quality assurance. ADSA, Logan, UT.
  7. Hansen, A.P. and **K.R. Swartzel**. 1979. Trained taste panel evaluation of UHT steam injected fluid dairy products subjected to varied process and storage conditions. ADSA, Logan, UT.
  8. Hansen, A.P., **K.R. Swartzel** and R.R. Earley. 1979. Effect of UHT processing and storage on the chemical and physical properties of UHT milk. International Conference on UHT Processing and Aseptic Packaging of Milk and Milk Products. NCSU Dept. of Food Science, Raleigh, NC.
  9. **Swartzel, K.R.**, D.D. Hamann and A.P. Hansen. 1980. Rheological properties of aged ultra-high-temperature steam injected soft serve ice cream mix and melt. ADSA, Blacksburg, VA.
  10. Biziak, R.B., **K.R. Swartzel** and V.A. Jones. 1981. Energy use in indirect UHT processing. 1981. ASAE, Orlando, FL.
  11. Kawanari, Masami, D.D. Hamann and **K.R. Swartzel**. 1981. Rheological and texture studies of butter. Society of Rheology, Williamsburg, VA.
  12. **Swartzel, K.R.** 1982. Thermal effects of ultra-high-temperature processing--mathematical analysis. AIChE, Orlando, FL.
  13. Biziak, R.B., **K.R. Swartzel** and V.A. Jones 1982. Comparison of energy use in direct and indirect UHT processing. American Society of Agricultural Engineers, Madison, WI.
  14. Hamid-Samimi, M.H., **K.R. Swartzel** and H.R. Ball. 1982. Rheological flow properties and protein denaturation of liquid whole egg during pasteurization. Society of Rheology, Evanston, IL.
  15. Ramsey, J.A. and **K.R. Swartzel**. 1983. Sedimentation in UHT-treated milk during storage. IFT, New Orleans, LA.
  16. **Swartzel, K.R.** 1983. Fouling in tubes by milk during ultra high temperature heating. American Institute of Chemical Engineers, Denver, CO.
  17. **Swartzel, K.R.** 1983. A continuous flow method for kinetic data generation. ASAE, Chicago, IL.
  18. **Swartzel, K.R.** 1983. UHT Aseptic Processing. Carolina-Virginia IFT Meeting, Raleigh, NC.
  19. **Swartzel, K.R.** 1984. Continuous thermal processing and packaging of fluid foods - reaction kinetics and process design. ACS, St. Louis, MO.
  20. **Swartzel, K.R.** and V.A. Jones. 1984. Continuous flow apparatus for kinetic studies. ASAE, Knoxville, TN.
  21. Hawran, L.J., V.A. Jones and **K.R. Swartzel**, 1984. Fouling during ultra high-

- temperature processing and subsequent sedimentation during storage of milk. AIChE, Philadelphia, PA.
22. Hamid-Samimi, M.H., **K.R. Swartzel**. 1984. Maximum product parameter changes during continuous flow heating. ASAE, New Orleans, LA.
  23. Hamid-Samimi, M.H., **K.R. Swartzel** and H.R. Ball, Jr. 1985. Aseptic packaging of ultra-pasteurized liquid whole egg. Southern Association of Agricultural Scientists, Biloxi, MS.
  24. McGuire, J. and **K.R. Swartzel**. 1985. Measuring substrata influences of biofouling. Second International Conference on Fouling and Cleaning in Food Processing (ICFCFP), Madison, WI.
  25. Rakes, P.R., **K.R. Swartzel** and V.A. Jones. 1985. Deposition of milk protein model solutions on heat exchange surfaces. IFT Meeting, Atlanta, GA.
  26. **Swartzel, K.R.** 1985. Generation, interpretation and use of kinetic data for design and evaluation of aseptic systems. IUFoST Symposium on Aseptic Processing and Packaging of Foods, Tylosand, Sweden.
  27. Hamid-Samimi, M.H., **K.R. Swartzel** and H.R. Ball, Jr. 1985. Aseptic Packaging of ultra-pasteurized egg. Design and economic considerations. IUFoST Symposium on Aseptic Processing and Packaging of Foods, Tylosand, Sweden
  28. Ball, Jr. H.R., P.M. Foegeding, **K.R. Swartzel**, and M.H. Hamid-Samimi. 1985. Function and shelf-life of ultrapasteurized, aseptically packaged whole egg. Poultry Science Association, Ames, IO.
  29. Sadeghi, Farid and **K.R. Swartzel**. 1986. Calibration materials for thermal systems. IFT Meeting, Dallas, TX.
  30. Sadeghi, Farid and **K.R. Swartzel**. 1986. Kinetic parameter determination at high temperature – a technique comparison study. IFT Meeting, Dallas, TX
  31. Martinez, R.M., H.R. Ball and **K.R. Swartzel**. 1986. Evaluation of ultrapasteurized aseptically packaged whole liquid eggs - homogenized and unhomogenized. Poultry Science Association, Raleigh, NC.
  32. McGuire, R.P., D.E. Carroll, and **K.R. Swartzel**. 1987. Aseptic process and packaging influences on tomato juice characteristics with comparison to convention canning. IFT Meeting, Las Vegas, NV, 44:467.
  33. McGuire, J. and **K.R. Swartzel**. 1987. Initial interfacial events which occur during fouling of heat exchangers by milk. IFT Meeting, Las Vegas, NV 13:108.
  34. McGuire, J. and **K.R. Swartzel**. 1987. The role of solid surface tension in macromolecular adsorption from milk. Minneapolis, MN.
  35. **Swartzel, K.R.** and D.O. Gray. 1987. Center for Aseptic Processing and Packaging Studies. IFT Meeting, Las Vegas, NV 29:292.
  
  36. Martinez, R.M., H.R. Ball Jr., **K.R. Swartzel** and F.G. Giesbrecht. 1987. Effects of ultra-pasteurization on aseptically packaged refrigerated liquid whole egg. IFT Meeting, Las Vegas, NV 44:467.
  37. **Swartzel, K.R.** 1987. The North Carolina State University Center for Aseptic Processing and Packaging Studies. Association for Gnotobiotics and Society for Intestinal Microecology and Disease Joint Meeting, Raleigh, NC. 5:37.
  38. **Swartzel, K.R.** 1988. NCSU's role in the Aseptic Revolution. Department of Food Science, NCSU, Spring Seminar Series.

39. **Swartzel, K.R.** 1988. The Center for Aseptic Processing and Packaging Studies. CAPPS, Raleigh, NC.
40. **Swartzel, K.R.** 1988. Innovations in aseptic processing and packaging. New Technologies for Food Industry Conference, Monterey Seminar Group, Carmel, CA
41. **Swartzel, K.R.** 1988. The profitability of understanding kinetics associated with aseptic processing and packaging studies. Conference on Aseptic Packaging, Bloomingdale, IL.
42. Rhim, J.W., R.V. Nunes, **K.R. Swartzel** and V.A. Jones. 1988. Development of a kinetic parameter evaluation model using linearly increasing temperature program. IFT Meeting, New Orleans, LA. Paper No. 70.
43. Rhim, J.W., R.V. Nunes, V.A. Jones, and **K.R. Swartzel**. 1988. Application of linearly increasing temperature in determining kinetic parameters of liquid foods. IFT Meeting, New Orleans, LA. Paper No.71
44. Nunes, R.V. and **K.R. Swartzel**. 1988. Modeling chemical and biochemical changes under oscillating temperatures. IFT Meeting, New Orleans, LA. Paper No. 73.
45. Nunes, R.V. and **K.R. Swartzel**. 1988. Critical evaluation of existing methods for sterilization time calculations: Continuous and batch processes. IFT Meeting, New Orleans. Paper No. 615.
46. Rhim, J.W., V.A. Jones and **K.R. Swartzel**. 1988. Kinetic studies of whey protein. IFT Meeting, New Orleans, LA. Paper No. 563.
47. Yang, B.B. and **K.R. Swartzel**. 1988. Method in studying flow patterns and residence time distribution of fluids containing particles. International Association of Milk, Food and Environmental Sanitarians, Tampa, Fl. Paper No. 18.
48. Miles, J.J. and **K.R. Swartzel**. 1988. Aseptic technology in food and pharmaceuticals: Combining parallel technologies. National Meeting of the American Institute of Chemical Engineers, Denver, Co. Paper No 60A.
49. **Swartzel, K.R.** 1988. Non-isothermal kinetic data generation for food constituents. NATO Workshop on Food Properties and Computer-Aided Engineering of Food Processing
50. **Swartzel, K.R.** 1989. Packaging Innovations. International Poultry Trade Show; Turkey Program, Atlanta, GA.
51. Rhim, J.W, R.V. Nunes, V.A. Jones and **K.R. Swartzel**. 1989. Validity and applicability of the equivalent point method and thermal evaluation. IFT Meeting, Chicago, IL. Paper No. 43.
52. Nunes, R.V., J.W. Rhim and **K.R. Swartzel**. 1989. Kinetic parameter evaluation with linearly increasing temperature profiles: integrated methods. IFT Meeting, Chicago, IL.
53. Yang, B.B. and **K.R. Swartzel**. 1989. Photoelectric sensors applied in studying residence time distributions of hold sections for aseptic processing containing particulates. IFT Meeting, Chicago, IL.
54. Nunes, Raul and **K.R. Swartzel**. 1989. Minimum energy usage in a continuous aseptic flow system while maintaining constant constituent changes. AIChE, San Francisco, CA. Paper No. 145E.
55. Ganesan, S.G., **K.R. Swartzel**, R.W. Hamaker, and R.T. Kuehn. 1990. Remote thermal sensor for particles in two-phase flow. ASAE International Winter Meeting, Chicago, IL.
56. Nunes, R.V. and **K.R. Swartzel**. 1990. Nonisothermal kinetic studies: statistical evaluation of one- step and two-step methods for estimating Arrhenius parameters. IFT

- Meeting, Anaheim, CA. Paper No. 32
57. Miles, J.J. and **K.R. Swartzel**. 1990. Development of sucrose inversion kinetics under conditions of continuous flow. IFT Meeting, Anaheim, CA. Paper No. 33.
  58. Miles, J.J. and **K.R. Swartzel**. 1990. Continuous flow reactor for generating kinetic data during isothermal and non-isothermal conditions. IFT Meeting, Anaheim, CA. Paper No. 634.
  59. Kumar, A. and **K.R. Swartzel**. 1990. Supercomputing applications in thermal processing operations for foods. Cray Research Science and Engineering Symposium, London, England.
  60. **Swartzel, K.R.** 1990. Recent developments in aseptic processing. International Conference on Designing and Engineering New Food Factories, Renovations and Expansions, Chicago, IL.
  61. Miles, J.J. and **K.R. Swartzel**. Advances in aseptic processing of particulate foods. Research and Development Associates for Military Food and Packaging Systems, Inc. Meeting, Boston, MA.
  62. Foegeding, P.M. and **K.R. Swartzel**. 1991. Past successes and new challenges for the Center for Aseptic Processing and Packaging Studies at North Carolina State University. Food Development and Marketing USA Conference Center, Harmon Meadow, NJ.
  63. Schwartz, S.J. and **K.R. Swartzel**. 1991. Aseptic processing & packaging-issues & technology. World Congress of Food Science and Technology, Toronto, Canada.
  64. Kumar, A., J. Blalock, and **K.R. Swartzel**. 1991. Modeling thermal and aseptic processes of foods using FIDAP. FIDAP Users Conference, Evanston, IL.
  65. Kumar, A., J.J. Miles, and **K.R. Swartzel**. 1991. Experimental and numerical evaluation of a continuous flow thermal system. ASAE Meeting, Chicago, IL.
  66. Schwartz, S.J., **K.R. Swartzel**, J.B. Giles. 1991. The center for aseptic processing and packaging studies--An overview. News in Aseptic Processing and Packaging Symposium, Technical Research Centre of Finland (VTT), Helsinki, Finland.
  67. Yang, B.B., R.V. Nunes and **K.R. Swartzel**. 1991. Modeling particulate sterilization during continuous flow thermal processing. Conference of Food Engineering, AIChE Meeting, Chicago, IL.
  68. Ganesan, S.G., **K.R. Swartzel**, R.W. Hamaker and D. Kuehn. 1991. Time-temperature profiles of particle centers in aseptic processes using a novel thermal sensor. ACS Annual Meeting; Agricultural and Food Chemistry Division, Atlanta, GA.
  69. Fairchild, T.M., **K.R. Swartzel** and P.M. Foegeding. 1991. Batch and continuous flow procedures to determine rapid inactivation rates of *Listeria innocua*. IFT Meeting, Dallas, TX.
  
  70. Miles, J.J. and **K.R. Swartzel**. 1992. Reaction kinetics of calibrating reactions for evaluation of continuous thermal processes. IFT Meeting, New Orleans, LA. Paper No. 43.
  71. Liebrecht, J.W., **K.R. Swartzel**, V.A. Jones, and H.R. Ball, Jr. 1992. Application of direct steam contact heating to extend the process run time of heat sensitive biological materials. IFT, New Orleans, LA. Paper No. 46.
  72. Ganesan, S.G., **K.R. Swartzel**, R.W. Hamaker and D. Kuehn. 1992. F<sub>0</sub> value determinations of food particles heated under continuous flow: Utilization of a novel

- thermal sensor. IFT Meeting, New Orleans, LA. Paper No. 620.
73. Palaniappan, S., A. Kumar, S.K. Sastry, and **K.R. Swartzel**. 1992. Experimental and numerical analysis of ohmic heating of liquid-particle mixtures in a static heater. IFT Meeting, New Orleans, LA. Paper No. 836.
  74. Ganesan, S.G. and **K.R. Swartzel**. 1992. Thermal sensor for food particles heated under continuous flow. AIChE Meeting, Minneapolis, MN. Paper No. 17b.
  75. Palaniappan, S., A. Kumar, S.K. Sastry, and **K.R. Swartzel**. 1992. Measurement of electrical conductivity of foods. AIChE Meeting, Minneapolis, MN. Paper No. 17e.
  76. Miles, J.J. and **K.R. Swartzel**. 1993. Continuous flow kinetic data generation for aseptic processes. International Symposium on Aseptic Processing and Packaging Technology for Prepared Foods. Hsinchu, (FIRDI), Taiwan, ROC. May 1993.
  77. **Swartzel, K.R.** and J.B. Giles. 1993. The center for aseptic processing and packaging studies--An industry/university cooperative research center. International Symposium on Aseptic Processing and Packaging Technology for Prepared Foods. Hsinchu, (FIRDI), Taiwan, ROC. May 1993.
  78. **Swartzel, K.R.** and A. Kumar. 1993. The equivalent point method for thermal evaluation--Applications to aseptic processing. International Symposium on Aseptic Processing and Packaging Technology for Prepared Foods. Hsinchu, (FIRDI), Taiwan, ROC. May 1993.
  79. Kumar, A. and **K.R. Swartzel**. 1993. Selected food engineering problems and their solutions through FEM. ASME WAM Forum on Advances in Finite Element Analysis in Fluid Dynamics. ASME Meeting, New Orleans, LA.
  80. Kumar, A. and **K.R. Swartzel**. 1993. Mathematical approaches to solving selected problems in aseptic processing. Center for Aseptic Processing and Packaging Studies Meeting, Research Triangle Park, NC. Poster presentation.
  81. Kumar, A., R.V. Nunes and **K.R. Swartzel**. 1993. A novel method for kinetic parameter estimation for nonisothermal heating in the aseptic processing temperature range. Food 2000: Integrating Processing, Packaging and Consumer Research. U.S. Army Natick Research, Development and Engineering Center, Natick, MA.
  82. **Swartzel, K.R.** 1994. Value added research: NCSU's incredible edible egg patent - A case study. NCSU Sigma Xi Invitation Banquet, Raleigh, NC.
  83. **Swartzel, K.R.** 1994. Value added research. Minnesota Section of the IFT Meeting, Minneapolis, MN.
  84. Kumar, A. and **K.R. Swartzel**. 1994. Experimental and Numerical Analysis of turbulent flow sterilization in a tubular heat exchanger. IFT Meeting.
  85. Kumar, A. and **K.R. Swartzel**. 1994. A line-intersection method for kinetic parameter estimation under nonisothermal conditions. IFT Meeting.
  
  86. Lee, H.G. and **K.R. Swartzel**. 1994. Enthalpy-entropy Compensation for a glucose-lysine maillard Reaction. J. Fd. Sci. IFT Meeting.
  87. **Swartzel, K.R.** 1995. Department of Food Science at North Carolina State University-- Handling and Processing Technologies for the Pickled Vegetable Industry. Pickle Packers Int., Inc. Meeting, Raleigh, NC.
  88. **Swartzel, K.R.** 1995. Welcome--Introduction Address. 1995 Dairy Foods Safety and

- Quality Conference, Clemmons, NC
89. Kyereme, M., B.E. Farkas, A. Kumar and **K.R. Swartzel**. 1995. Equivalent point method: a design tool for thermal process evaluation. IFT Meeting, Anaheim, CA.
  90. Simunovic, J., **K.R. Swartzel**, B.E. Farkas and J.P. Adams. 1995. Measurement of particle residence times in aseptic holding tubes by application of digital video and image analysis. IFT Meeting, Anaheim, CA
  91. Abdelrahim, K.A., **K.R. Swartzel**, H.S. Ramaswamy, B.E. Farkas and M. Marcotte. 1995. Dimensionless correlations for the mean particle velocity in a pilot scale aseptic system. IFT Meeting, Anaheim, CA
  92. Abdelrahim, K.A., B.E. Farkas and **K.R. Swartzel**. 1995. Residence time distribution characteristics of carrier fluids in helical and straight holding tubes. IFT Meeting, Anaheim, CA.
  93. Abdelrahim, K.A., B.E. Farkas and **K.R. Swartzel**. 1995. Effect of particle size and secondary flow on residence time distributions (RTD) in helical and straight tubes of aseptic processing systems. Symposium on Food Science and Technology, in conjunction with the 26th Annual Meeting of the Fine Particle Society. Chicago.
  94. Abdelrahim, K.A., B.E. Farkas and **K.R. Swartzel**. 1995. Investigation of helical holding tubes for two-phase flow in aseptic processing of low acid particulate foods. International Symposium on Advances in Aseptic Processing and Packaging Technologies. Copenhagen, Denmark, Sept. 11-12. Abstract published in proceedings, SIK, Thomas Ohlsson, Ed., Goteborg, Sweden.
  95. Simunovic, J., **K.R. Swartzel**, B.E. Farkas and J.P. Adams. 1995. Particle residence time measurement and single and multiple solid phase particulate products in clear aseptic holding tube segments. International Symposium on Advances in Aseptic Processing and Packaging Technologies, Copenhagen, Denmark.
  96. **Swartzel, K.R.** 1995. Aseptics - Yesterday, today and beyond. International Symposium on Advances in Aseptic Processing and Packaging Technologies. Copenhagen, Denmark and Annual Food and Dairy Industries Conference, The Ohio State University, Columbus, OH.
  97. **Swartzel, K.R.** 1995. Department of Food Science at North Carolina State University - Handling and Processing Technologies for the Pickled Vegetable Industry. Pickle Packers International, Inc. Meeting, Raleigh, NC.
  98. **Swartzel, K.R.** 1995. Applications for the Equivalent Point Method of thermal evaluation. Conference of the Institute for Thermal Processing Specialists, Washington, D.C.
  99. Kyereme, M., **K.R. Swartzel**, B.E. Farkas and J. J. Miles. 1995. Computational improvements in the equivalent point method for thermal process evaluation through the use of a reference temperature and Romberg integration. International Symposium on Advances in Aseptic Processing and Packaging Technologies, Copenhagen, Denmark, Sept. 11-12.
  100. Kyereme, M., **K.R. Swartzel** and B.E. Farkas. 1996. Analysis of the thermal destruction kinetics of bacterial spores and nutrients using Arrhenius and Bigelow models. IFT Meeting, New Orleans, LA.
  101. Lechowich, R.V. and **K.R. Swartzel**. 1996. Co-moderators and organizing committee member, NCFST and CAPPS workshop on Aseptic Processing of Multiphase Foods. IFT Meeting, New Orleans, LA.
  102. Simunovic, J., **K.R. Swartzel**, B.E. Farkas and J.P. Adams. 1997. Multiphase Aseptic

- Processing- Particle Velocities. IFT Meeting, Orlando, FL. Paper No. 66-4
103. **Swartzel, K.R.** 1997. Past and Present Challenges for Aseptics and Future Challenges and New Markets for Aseptics. Presented at the International Symposium Advances in Aseptic Processing and Packaging Technologies. Food Industry Research and Development Institute, Hsinchu, Taiwan.
  104. Simunovic, J., **K.R. Swartzel**, B.E. Farkas and J.P. Adams. 1997. Multiphase Flow in Horizontal Aseptic Holding Tubes: Particle Velocity vs. Particle Density Relationships and Multiphase Flow in Horizontal Aseptic Holding tubes: Spatial and Temporal and Solids Distribution. International Symposium Advances in Aseptic Processing and Packaging Technologies. Food Industry Research and Development Institute, Hsinchu, Taiwan.
  105. Shoemaker, S.P. and **K.R. Swartzel**. 1997. Aseptic Processing and Packaging for the Production of Food Products. Am. Chemical Society National Meeting, San Fran., CA.
  106. **Swartzel, K.R.** 1997. Aseptics □ Ten Years Ago and Aseptic Processing Projects during the Past Ten Years. CAPPS Meeting, Raleigh, NC.
  107. **Swartzel, K.R.** 1997. Integration of Process Design and Plant Design, Suitt Food Ind. Training Forum, Greenville, SC.
  108. **Swartzel, K.R.** 1997. The Time is Now for the U.S. to Capitalize on Aseptic Processing and Packaging of Particulate Foods. AIChE Meeting. Paper No. 64a.
  109. Simunovic, J. and **K.R. Swartzel**. 1998. Methods and systems for residence time measurement of particles in continuous thermal bioprocessing, ACoFoP IV (Automatic Control of Food and Biological Processes), International Symposium, Goteborg, Sweden.
  110. Simunovic, J. and **K.R. Swartzel**. 1998. Particle velocity range characterization in continuous multiphase aseptic systems. Institute for Thermal Processing Specialists Conference, Washington, D.C.
  111. **Swartzel, K.R.** 1998. Aseptic Dairy Process Engineering in the United States. Nestle Konolfingen Dairy Aseptic Research Laboratory, Konolfingen, Switzerland.
  112. **Swartzel, K.R.** 1998. Challenges for the Process Specialist in the 21st Century. Conference of the Institute for Thermal Processing Specialists. Washington, DC. Keynote speaker.
  113. **Swartzel, K.R.** 1998. Engineering Innovations in Aseptic Processing and Packaging. The University of Missouri Biological Resources Unit Lecture Series. Invited presentation.
  114. **Swartzel, K.R.** 1998. Future Directions in Aseptic Technology Tomorrows Innovations Today. The New Innovation Symposium on Sterilization/Aseptics, sponsored by Becton Dickerson Company, Baltimore, MD. Invited presentation.
  
  115. **Swartzel, K.R.** 1998. Treatment of University Intellectual Property. Mississippi State University Technology Transfer Forum, Starksville, MS.
  116. Simunovic, J. and **K.R. Swartzel**. 1999. Multiple magnetic ID tagging for particle residence time characterization in multiphase aseptic systems. Abstract No. 60-1. IFT Meeting, Chicago, IL.
  117. **Swartzel, K.R.** 1999. Future Directions Challenges for the Process Specialist in the 21st Century. SME Update on Innovations in Aseptic Processing and Packaging.



118. Simunovic, J. and **K.R. Swartzel**. 1999. Multiple magnetic ID tagging for particle residence time characterization in multiphase aseptic systems. Abstract No. 60-1. IFT Meeting, Chicago, IL.
119. **Swartzel, K.R.** 1999. Future Directions Challenges for the Process Specialist in the 21st Century. SME Update on Innovations in Aseptic Processing and Packaging.
120. **Swartzel, K.R.** 2000. Challenges for the process specialist in the 21<sup>st</sup> Century. International Congress on Engineering and Food, Puebla, Mexico (to be published in Engineering and Food for the 21<sup>st</sup> Century in 2001, Technomic Publishing Company, J. Welt-Chanes, G. Barbosa-Canovas and J. Miguel Aguilera, eds.
121. Boldor, D., T.H. Sanders and **K.R. Swartzel**. 2000. Peanut maturity determination using machine vision and image processing. IFT Meeting, Dallas, TX. Paper No. 86A-34.
122. **Swartzel, K. R.** and J. Simunovic. 2001. Thermal processing-Still canning after all these years. To be presented at the IFT annual meeting, New Orleans as part of the 25<sup>th</sup> anniversary of the Division of Food Engineering.
123. **Swartzel, K.R.** 2001. Compact Planning. Invited Presentation In: Executive Workshop on Academic Strategic Planning @ 2001 AAAS Annual Meeting and Science Innovation Exposition, San Francisco. (Representing Chancellor Fox).
124. Simunovic, J., P. Coronel, J.M. Drozd, **K.R. Swartzel** and K.P. Sandeep. 2001. Rapid heating of fluid foods in cylindrical microwave reactors. Presented as paper #13-8. IFT Annual Meeting, New Orleans.
125. Simunovic, J. and **K.R. Swartzel**. 2002. What's new with microwave processing? Presented at the summer "What's New? At General Mills, Minneapolis Swartzel, K.R. 2001 & 2002. Managing a multi-site IUCRC. Presented @ the NSF IUCRC program annual Center Directors Meeting, Washington, D.C.
126. Palazoglu, T.K., Simunovic, J., Sandeep, K.P., **Swartzel, K.R.** 2003. Conservative process evaluation for multiphase aseptic processing: magnetic sensor arrays and thermo-magnetic switch implants. IFT Paper No. 29D-6. 2003 IFT Annual Meeting: Book of Abstracts, July 12- 16, Chicago, IL.
127. Jasrotia, A.K., Simunovic, J., **Swartzel, K.R.**, Sandeep, K.P. 2003. Multiphase aseptic processing: Selection and detection of magnetic particle implants for monitoring residence time and time-temperature history. CoFe '03, Technical Program and Extended Abstracts. 6<sup>th</sup> Conference of Food Engineering (Sponsored by the AIChE), Nov. 18-20, San Francisco, CA.
128. Simunovic, J., **Swartzel, K.R.**, Palazoglu, T.K., Sandeep, K.P., Cartwright, G. 2003. Aseptic Processing of Low Acid Multiphase Products: Recent Advances in Particle Flow Monitoring and Process Validation; Aseptipak 2003, Orlando, Florida.
129. **Swartzel, K.R.** 2003. Technology transfer-an inventor's perspective. Presented to a delegation from Russia in an university/industry technology transfer training session organized by Technology Commercialization Group, LLC. Raleigh.
  
130. Palazoglu, T.K., Simunovic, J., Sandeep, K.P., **Swartzel, K.R.** 2003. Conservative process evaluation for multiphase aseptic processing: magnetic sensor arrays and thermo-magnetic switch implants. IFT Paper No. 29D-6. 2003 IFT Annual Meeting: Book of Abstracts, July 12- 16, Chicago, IL.
131. Jasrotia, A.K., Simunovic, J., **Swartzel, K.R.**, Sandeep, K.P. 2003. Multiphase aseptic

- processing: Selection and detection of magnetic particle implants for monitoring residence time and time-temperature history. CoFe '03, Technical Program and Extended Abstracts. 6<sup>th</sup> Conference of Food Engineering (Sponsored by the AIChE), Nov. 18-20, San Francisco, CA.
132. Simunovic, J., **Swartzel, K.R.**, Palazoglu, T.K., Sandeep, K.P., Cartwright, G. 2003. Aseptic Processing of Low Acid Multiphase Products: Recent Advances in Particle Flow Monitoring and Process Validation; Aseptipak 2003, Orlando, Florida.
133. **Swartzel, K.R.** 2003. Technology transfer-an inventor's perspective. Presented to a delegation from Russia in a university/industry technology transfer training session organized by Technology Commercialization Group, LLC. Raleigh.
134. Simunovic J., **Swartzel K.R.**, Palazoglu, T. and Sandeep, K. P.2004.Multi-Functional System for Particle Flow Monitoring and Validation of Continuous Thermal Processing for Multiphase Aseptic Products. International Conference for Engineering and Food. Montpellier, France March 7-11.
135. Schirack, A.V., P. Coronel, C.M. Sobliov, K.P. Sandeep, J. Simunovic, G. Cartwright, **K.R.Swartzel.** 2003. Continuous flow microwave heating of liquid foods. 5<sup>th</sup> International Conference of Food Science and Technology. October 22-24, Wuxi, China.
136. **Swartzel, K. R.** 2004. Food Processing Case Studies: Engineering the Future-Yesterday, Today and Tomorrow. Invited IFT Fellow lecturer presented in the Iowa State University-Modern Views of Nutrition Seminar Series and Sponsored by IFT and The Nutritional Sciences Council. Iowa State University, March 30, 2004.
137. **Swartzel, K.R.** 2004. Intellectual property in the university-what is it, how do we know we have it, and if we find out we have it, what do we do with it? Presented to the faculty of the College of Agricultural, Iowa State University, March 31<sup>st</sup>, 2004.
138. Jasrotia, A. K., T.K. Palazoglu, J. Simunovic, **K.R. Swartzel** and K.P. Sandeep. 2004. Conservative process evaluation for multiphase aseptic processing: Design, fabrication and testing of implant-carrier simulated particles. 17H-9 2004 IFT Annual Meeting July 12-16, Las Vegas, NV.
139. Jones, Steve and **K.R. Swartzel.** 2004. North Carolina State University Proposal for the national Food Systems Leadership Institute (FSLI). Presented to the NASULGC FSLI Commission on FSLI in Washington, DC, April 30<sup>th</sup>, 2004.
140. **Swartzel, K.R.** 2004 Implementation of the FSLI, presented to the NASULGC FSLI Design Team, Orlando, Fl. July 27-28.
141. **Swartzel, K.R.** 2004. Presentation to various groups during three sites visits to establish secondary sites for the FSLI- University of Vermont (October 13-15), University of California-Davis (November 17-19) and The Ohio State University (October 20-22).
142. **Swartzel, K.R.** and J. Simunovic. 2004. Integrated system for conservative process establishment for multiphase aseptic products. ASEPIPAK Europe-Global Forum on Aseptic Processing, Filling & Packaging. Frankfurt, Germany, December 2-3. Scotland Business Research, Inc. Group.
143. Simunovic, J. and **K.R. Swartzel.** 2004. Continuous flow microwave sterilization: Feasibility testing for aseptic products-from dielectric analysis to shelf life studies. ASEPIPAK Europe-Global Forum on Aseptic Processing, Filling & Packaging.

- Frankfurt, Germany, December 2-3. Scotland Business Research, Inc. Group.
144. **Swartzel, K.R.** 2004. The Food System Leadership Institute. Presented at Both the Administrative Heads Meeting and the Board on Agricultural Assembly at the NASULGC Annual Meeting in San Diego.
  145. **Swartzel, K.R.** 2005. Food Systems Leadership Institute. Presented at the 2005 National Extension Directors/Administrators Meeting. Nashville.
  146. **Swartzel, K.R.** and Josip Simunovic. 2005. Validation of Continuous Aseptic Processes Including Particulate Foods. Presented at the Institute for Thermal Processing Specialists Annual Meeting, Orlando, Florida.
  147. **Swartzel, K.R.** 2005. The Food System Leadership Institute. Presented to the Administrative Heads at the Annual CARAT Meeting, Washington, D.C.
  148. **Swartzel, K.R.** 2005. Advancing and strengthening the Food Chain. Presented at the International Food Symposium. Calgary, Alberta, Canada.
  149. Jasrotia, A.K.S., Simunovic, J, Sandeep, K.P., Palazoglu, T.K, and **Swartzel, K.R.** 2005. Construction and Testing of Implant Carrier Particles for Validation of Multiphase Aseptic Processes. IFT Paper No. 71D-11. July 16-20, New Orleans.
  150. **Swartzel, K.R.** 2005. Transition to Self-Sufficiency: Critical Questions. Invited presentation at the Annual Meeting of the National Science Foundation IUCRC Center Director's Conference. Washington, D.C. January, 13.
  151. **Swartzel, K.R.** 2005. Food Systems Leadership Institute. Presented at the National Extension/Administrators meeting, Nashville, TN. February 17.
  152. **Swartzel, K.R.** and J. Simunovic. Validation of Continuous Aseptic Processes Including Particulate Foods Presented at the Institute for Thermal Processing Specialists 24<sup>th</sup> Annual Conf. & General Meeting February 22-24, 2005 Orlando, FL.
  153. **Swartzel, K.R.** 2005. Food Systems Leadership Institute. Presented at the Winter Meeting of the National Association of State Universities and Land-Grant Colleges, Administrative Heads Section Meeting, Washington, D.C. February 28, 2005
  154. **Swartzel, K.R.** 2005. Your Leadership Toolbox Presented at the 1<sup>st</sup> Residential week of the FSLI, Chapel Hill, October 7.
  155. **Swartzel, K.R.** 2005. Research at a Land-Grant College of Agriculture and Life Sciences (The Next Twenty Years). Presented to the College Of Agricultural and Life Sciences, NCSU, May 19.
  156. **Swartzel, K.R.**, J. Simunovic, Lee-Ann Jaykus and K.P. Sandeep, USDA National Integrated Food Safety Initiative-. Safety of Foods Processed by Four Alternative Processing Technologies: Aseptic Processing Using Continuous Flow Microwave Heating. Presented at the Annual USDA Project Update, Columbus, Ohio, Oct. 19.
  157. **Swartzel, K.R.** 2005. Developing individual and institutional leadership for a 21<sup>st</sup> century food system. Presented at the NASULGC Annual Board on Agriculture Assembly Meeting, Washington, D.C. 11/14/2005.
  158. **Swartzel, K.R.** and C. Fernandez. 2005. Food Systems Leadership Institute Curriculum Update.
  159. **Swartzel, K.R.**, FSLI. Presented at the NASULGC Annual Administrative Heads Meeting, Washington, D.C. 11/14/2005.
  160. **Swartzel, K. R.** 2005. Food Processing Case Studies: Engineering the Future- Yesterday, Today and Tomorrow. Invited IFT Fellow lecturer presented in the Southern Food Industry Research & Development Institute, Tainan, Taiwan. 12/12/05

161. **Swartzel, K. R.** 2005 Multiphase Aseptic Processing-Addressing the US Regulation Considerations. Invited speaker at the Uni-President Enterprise Co. Headquarter and R&D Division, Tainan, Taiwan. 12/12/05
162. **Swartzel, K. R.** 2005. Continuous Flow Microwave Sterilization: the Future is Now! Invited Keynote speaker at the FIRDI/Taiwanese Institute for Food Technology Symposium on Microwave Heating Applications for the Food Industry. Tainan, Taiwan. 12/13/05.
163. **Swartzel, K. R.** 2005 Ultra-pasteurization of Liquid Eggs & Pasteurization of Shell Eggs-the future of Microwave heating. Invited speaker at the FIRDI sponsored workshop for liquid –egg processing. Tainan. Taiwan. 12/14/05.
164. **Swartzel, K. R.** 2005. Food Processing Case Studies: Engineering the Future- Yesterday, Today and Tomorrow. Invited IFT Fellow lecturer presented in the National Chong-Hsing University, Taichung, Taiwan. 12/15/05
165. **Swartzel, K.R.** 2006. Food System Leadership Institute. Strong Leadership and Industry Renewal: Maximizing Human Resources. Presented @ the Outlook Conference 2006, Toronto, Canada. November 9, 2006.
166. **Swartzel, K.R.** 2006. Food Systems Leadership Institute. Presented at the Winter Meeting of the National Association of State Universities and Land-Grant Colleges, Board on Agricultural Assembly, Houston, TX., November 13.
167. **Swartzel, K.R.,** J. Simunovic, Lee-Ann Jaykus and K.P. Sandeep ,USDA National Integrated Food Safety Initiative-.Safety of Foods Processed by Four Alternative Processing Technologies: Aseptic Processing Using Continuous Flow Microwave Heating. Presented at the Annual USDA Project Update, Raleigh, October 11<sup>th</sup>.
168. **Swartzel, K.R.** and C. Fernandez. 2006. Food Systems Leadership Institute Capstone Project Overview. Presented at the NASULGC Annual Administrative Heads Meeting, Houston, TX November 13<sup>th</sup>-facilitated with Craig Beyrouy from Purdue University.
169. Fernandez, C.S. Plaisted, M.Bryan, and **K.R. Swartzel.** 2006. Food Systems Leadership Institute: Positioning leaders in nutrition & dietetics to influence the food systems of the future. Presented at the 2006 American Dietetic Association, Honolulu, Hawaii.
170. Simunovic, J. & **K.R. Swartzel.** 2006. Investigation of the effect of rapid heating and cooling on the quality of aseptically processed multiphase foods. Presented as paper # 078D-2@ Annual Meeting of IFT, Orlando.
171. Kumar, P., P. Coronel, J. Simunovic, **K.R. Swartzel** & K.P. Sandeep. 2006. Comparison of dielectric properties of “ salsa con Queso” products measured under static-indirect heating and cont. flow microwave heating conditions. Presented as paper # 0780-22@ Annual Meeting of IFT, Orlando.
172. Kumar, P., P. Coronel, J. Simunovic, **K.R. Swartzel** & K.P. Sandeep. 2006. Dielectric property measurement of particulate and homogenized vegetable salsa ingredients for simulated particle design. Pres. as paper # 078D-23 @ Annual Meeting of IFT, Orlando.
173. Coronel, P., V. Truong, P. Kumar, J. Simunovic, **K.R. Swartzel** and K. P. Sandeep.2006. Microwave-assisted aseptic processing: Dielectric properties of vegetables purees under static and continuous flow conditions. Presented as paper # 078D-24 @ Annual Meeting of IFT, Orlando.
174. Coronel, P., V. Truong, P. Kumar, J. Simunovic, **K.R. Swartzel** & G. Cartwright. 2006. Microwave-assisted aseptic processing of vegetable purees: Cross-sectional temperature profiles during heating and sterilization. Presented as paper # 078D-25 @ Annual

- meeting of IFT, Orlando.
175. Brinley, T. A., C.N. Stam, V.-D. Truong, P. Coronel, P. Kumar, J. Simunovic, K.P. Sandeep, G.D. Cartwright, **K.R. Swartzel** and L.-A. Jaykas. 2007. Feasibility of utilizing bio-indicators for testing microbial inactivation in sweetpotato puree processed with a continuous microwave system. IFT Paper No.8-05.
  176. Steed, L.E., Truong, V.D., Kumar, P., Simunovic, J., Cartwright, G.D., **Swartzel, K.R.** 2007. Microwave-assisted aseptic processing and packaging of purple-fleshed sweetpotato puree for functional foods. IFT Paper No.10046.
  177. Kumar, P., Simunovic, J., Coronel, P., Truong, V.D., Sandeep, K.P., **Swartzel, K.R.**, Strizak, Z. 2007. Determination of thermal conductivity and diffusivity of solid food ingredients at sterilization level temperatures. IFT Paper No. 96-04. IFT annual meeting, July 28-Aug 1, Chicago, IL.
  178. Steed, L.E., Truong, V.D., Kumar, P., Simunovic, J., Cartwright, G.D., **Swartzel, K.R.** 2007. Microwave-assisted aseptic processing and packaging of purple-fleshed sweetpotato puree for functional foods. IFT Paper No. 100-46. IFT, July 28-Aug 1, Chicago, IL.
  179. **Swartzel, K.R.** 2007. Asset Management and Commercialization-a University Perspective. Presented to the 3rd Cohort of the Food System Leadership Institute by way of conference call and slides.
  180. **Swartzel, K.R.** Biofuels Initiatives. December 2007, Company recruitment-Presented to a delegation from ADM. RTI.
  181. **Swartzel, K.R.** 2007. Are Farms the Answer to North Carolina's 21st Century Energy Needs? Summer 2007 NC Research Station Superintendent's Meeting, Boone, NC.
  182. **Swartzel, K.R.** and J. E. Marcy. 2007. Food, Food Packaging and Storage Issues Associated with Base Camp Sustainability. Base Camp Sustainability Conference sponsored by the US Army Research Office, September 12 - 14, 2007, Raleigh.
  183. **Swartzel, K.R.** 2007. Food, food packaging and storage issues associated with base camp sustainability. Presented and published in the proceedings of the The Army Research Office Base Camp Sustainability Workshop, Raleigh, N.C.
  184. Truong, V.D., J. Simunovic, P. Coronel, K.P. Sandeep, G. Cartwright and **K.R. Swartzel**. 2008. Recent development in processing of sweetpotato puree for functional food ingredient. Presented at the Annual Meeting of the National Sweetpotato Collaborators Group, Asheville, N.C.
  185. Coronel, Pablo M., J. Simunovic, **K. R. Swartzel**, Van Den Truong, K. P. Sandeep, 2008. Potential for minimization of color degradation of aseptically processed banana purees by continuous flow microwave sterilization. Poster # 133-07. IFT Annual Meeting, New Orleans.
  186. Simunovic, J, P. M. Coronel, Van Den Truong, G. D. Cartwright, **K.R. Swartzel**, K. P. Sandeep. 2008. Development and commercialization of microwave-assisted aseptic processing and packaging of vegetable purees. Paper # 084-06 presented at the IFT Annual Meeting, New Orleans.
  187. Josip Simunovic, P. M. Coronel, **K. R. Swartzel**, Van Den Truong, and K. P. Sandeep. 2008. Rapid microwave heating for preservation of fruit pulps and homogenates: Dielectric properties and heating characteristics of berries. Poster # 133-12. IFT Annual

- Meeting, New Orleans.
188. Steed, L. E., V. D. Truong, K. P. Sandeep, P. Kumar, J. Simunovic, G. D. Cartwright, and **K. R. Swartzel**. 2008. Nutraceutical content and quality of purple-fleshed sweet potato puree as affected by canning and microwave-assisted aseptic processing. Poster 133-19. IFT Annual Meeting , New Orleans.
  189. Coronel,P.M., J. Simunovic, Van Den Truong,**K. R. Swartzel**, and K. P. Sandeep. 2008. Poster 095-34. IFT Annual Meeting , New Orleans.
  190. Simunovic, J.,T. K. Palazoglu, P. Coronel, P. Kumar, C. Stam, **K. R. Swartzel**, A. K.S. Jasrotia, Gary Cartwright, and K.P. Sandeep. 2008. Monitoring and validation of microwave-assisted aseptic processing of multiphase foods: Comprehensive overview. Poster 095-30. IFT Annual Meeting ,New Orleans.
  191. Truong, V.D., J. Simunovic, P. Coronel, K.P. Sandeep, G. Cartwright and **K.R. Swartzel**. 2008. Recent development in processing of sweetpotato puree for functional food ingredient. Presented at the Annual Meeting of the National Sweetpotato Collaborators Group, Asheville, N.C.
  192. **Swartzel, K.R.** 2008. Management and Commercialization-. Asset a University Perspective. Presented to the 3rd Cohort of the Food System Leadership Institute by way of conference call and slides.
  193. **Swartzel, K.R.** 2008. Biofuels Initiatives presented as part of a group to several company recruitment presentations, including to the new BCNC administration.
  194. Fernandez, C. and **K.R. Swartzel**. 2008. Major Changes at MajorState University: Challenges for Administrative Leaders in the School of Agriculture. Presented at the fall residential session of the FSLI, Chapel Hill.
  195. **Swartzel, K.R.** 2009. Faculty Entrepreneurship: The Good, The Bad & The Ugly. Presented in the University of Southern Alabama Research Seminar Series.
  196. Fernandez, C. and **K.R. Swartzel**. 2009 Power and Persuasion at MajorState University:Challenges for Administrative Leaders in the School of Agriculture II. Presented at the winter residential session of the FSLI, Columbus, Ohio.
  197. **Swartzel, K.R.,** 2009. Faculty Entrepreneurship. Presented at University of South Alabama, Mobile, AL.
  198. Kumar, P., Simunovic, J., Truong, V.D., **Swartzel, K.R.,** Cartwright, G.D., Sandeep, K.P. 2009. Temperature distributions and dielectric properties of vegetable purees under continuous flow microwave heating. IFT Paper No. 225-28. IFT Annual Meeting, Anaheim,
  199. **Swartzel, K.R.** 2010. Asset Management and Commercialization-a University Perspective. Presented to the 5th Cohort of the Food System Leadership Institute by way of conference call and slides.
  
  200. Abata, D.L., D. Dixon, D. Mahajan, S. Peretti, M.Rezac, **K.R. Swartzel**, S. Turn & R. Winter. 2010 The Center for Bioenergy Research and Development-an NSF Industry University Cooperative Research Center. Accepted to be presented @ the April 32nd Symposium on Biotechnology for Fuels and Chemicals, Clearwater Beach, Fl.
  201. Druga, M., J. Simunovic and **K.R. Swartzel**. 2010. Particle flow monitoring system for aseptic processing of multiphase/particulate foods. Real-time analysis and optimization of

- detection sensitivity. Poster # 071-28 presented at the 2010 IFT annual meeting in Chicago.
202. Thibault, Y, M., J. Simunovic, K.P. Sandeep, G.D. Cartwright, **K.R. Swartzel** and Throng. Continuous-flow microwave sterilization and aseptic packaging of diced Roma tomatoes. Presented as paper # 074-03 at the 2010 IFT annual meeting in Chicago.
  203. Truong, V. D., R. L. Thompson, R. F. McFeeters, J. Simunovic, G. D. Cartwright, P. Coronel, P. Kumar, K. P. Sandeep and **K. R. Swartzel** 2010. Carotenoids and Tocopherols in Sweetpotatoes Subjected to Pureeing and Continuous Flow Microwave Sterilization. Presented at the 2010 IFT Annual Meeting in Chicago.
  204. Steed, L.E., V.D, Truong, J. Simunovic, K.P. Sandeep, G. Cartwright, **K.R. Swartzel**. 2010. Texture and color retention of sweetpotato cubes subjected to continuous flow microwave processing. Paper # 088-12 at the 2010 IFT annual meeting in Chicago.
  205. Simunovic, J., M. Druga and **K.R.Swartzel** . Ultraseptics particle flow monitoring system for conventional and advanced multiphase aseptic processing. Presented as paper # 208-02 in the New Products & Technologies Symposium at the Annual meeting of IFT in Chicago.
  206. Gray, D., Drew Rivers and **K.R. Swartzel**. 2011. Developing Scientific and Technological Leadership and Human Capital: Impact of IUCRC Directorship on Career Paths and Achievement. 2010 NSF Center Director's Annual Meeting
  207. **Swartzel, K.R.**, Promoting and capitalizing on knowledge transfer and commercialization. Accepted for presentation at the NSF Annual Center's Director's Meeting in DC, January, 2011.
  208. **Swartzel, K.R.**, Advanced meal processing and preparation. Invited Keynote speaker at the International Conference on Engineering and Food. Athens, Greece.
  209. **Swartzel, K.R.** 2011. Promoting and Capitalizing on Knowledge/Technology Transfer and Commercialization. Presented at the NSF IUCRC Center Director's Annual Meeting in Washington, DC . Jan. 11, 2011.
  210. **Swartzel, K.R.** 2011. FSLI Conference Call Series-Asset Management and Commercialization, Jan. 20th, 2011.
  211. **Swartzel, K.R.** 2011. FSLI Conference Call Series-Peter Jennings' "How to get Fat without really trying." Dec. 2nd, 2010.
  212. **Swartzel, K.R.** 2011. Quality considerations, process optimization, and scale-up. Presented at the Michael Foods, Inc. Short Course on Conventional and Advanced Continuous Flow Thermal Processing, August 22, 2011.
  213. **Swartzel, K.R.** 2011. CAPPS: An Industry-University-Government Center. Presented at the Michael Foods, Inc. Short Course on Conventional and Advanced Continuous Flow Thermal Processing ,August 22, 2011.
  214. **Swartzel, K.R.** 2011. Kinetics of chemical, microbiological, and enzymatic reactions. Presented at the Michael Foods, Inc. Short Course on Conventional and Advanced Continuous Flow Thermal Processing, August 22, 2011.
  215. **Swartzel, K.R.** 2011. Kinetics of chemical, microbiological, and enzymatic reactions. Presented at the Conventional and Advanced Continuous Flow Thermal Processing Short Course-Raleigh, October 5, 2011.
  216. **Swartzel, K.R.** 2011. CAPPS: An Industry/University/Government Center, presented at the Conventional and Advanced Continuous Flow Thermal Processing Short Course, Raleigh. October 5, 2011.

217. **Swartzel, K.R.** 2011. Determination of D and z values for microorganisms and quality attributes. Presented at the Thermal Process Design & Calculations Short Course, Raleigh, October 6, 2011.
218. **Swartzel, K.R.** 2011, 2012, 2013 & 2014. Asset Management and Commercialization-a University Perspective. Presented to the 5<sup>th</sup>-8<sup>th</sup> Cohort of the Food System Leadership Institute by way of conference call and slides.
219. Truong, V., R. Thompson, J. Simunovic, G. Cartwright, P. Caronel, P. Kumar, K. Sandeep, **K. Swartzel**. Carotenoids and Tocopherols in Sweet Potatoes Subjected to Pureing and Continuous Flow Microwave Sterilization. N.C. State Univ., Raleigh, N.C. Paper # 230-06 presented at the 2012 IFT meeting in Las Vegas.
220. **Swartzel, K.R.** 2013. Developing Professionally. Paper #S103cd presented at the Annual Meeting of IFT in Chicago.
221. **Swartzel, K.R.** 2013. Feeding the World in 2050 will take Strong Leadership. Presented at the SERA42 National Leadership Meeting. 126<sup>th</sup> APLU Meeting, Washington, D.C.
222. **Swartzel, K.R.** 2014. Space to Food Processing. February NCSU Encore Presentation. Raleigh, N.C.
223. Masri, Samir and **K.R. Swartzel**. November 2<sup>nd</sup>, 2016. Exhibiting and training associated with food processing equipment associated with Aseptia. Expo at the Dogwood Sectional, IFT Meeting, Concord, NC,
224. **Swartzel, K.R.** 2017. Food for 2050 and Beyond. Presented at the Taiwan Food Industry R & D Institute. April 19, Chiayi, Taiwan.
225. **Swartzel, K.R.** 2017. Keynote Address to the 2017 Symposium on Aseptic Processing and Packaging- The Challenge of Validating Aseptic Particle-Laden Systems, April 20, Chiayi, Taiwan.
226. **Swartzel, K.R.** 2019. The Future of Food Processing. Texas A & M Distinguished Lecture Series-April 29<sup>th</sup>, 2019.

## **CONSULTATIONS/ EXPERT WITNESS**

20+ Industrial consultations (domestic and foreign) and several expert witness patent infringement lawsuit cases, including 22 days of depositions and 5 days total on the stand in several federal courts.