

Department of Food Science



Dale Bumpers College of Agricultural,
Food & Life Sciences

2005 Annual Report
Department of Food Science
July 2006

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I. Mission and Goals

The Department of Food Science is responsible for advancing knowledge and technology associated with the discipline of Food Science through effective education, research and outreach programs according to the Land Grant Mission of the University of Arkansas. The Department of Food Science promotes programs for achieving regional, national and international recognition of excellence while contributing to the quality of life and professional development. Primary goals are to:

- Recruit and retain highly qualified students
- Educate students to their academic and creative potential and graduate students who are professionally competent and prepared for successful careers.
- Improve basic and applied research productivity, quality and importance.
- Enhance multidisciplinary, multi-institutional and industrial funded research initiatives.
- Enhance recognition of research and outreach programs based on significance and impact of contributions.
- Provide environment and opportunities for advancing professional development of faculty and support personnel.

During 2005 substantial progress was accomplished in educational, research and outreach programs which are highlighted in this annual report.

II. Significant Achievements and Changes

A. Progress Related to Strategic Plans and University Priorities

The Department of Food Science accomplished major changes during 2005 that will greatly improve capabilities, productivity and quality of Food Science research, teaching and outreach programs.

The employment of a faculty member (Dr. Steve Ricke) in an endowed chair and professor position to serve as the Director of the Center of Food Safety and a faculty member (Dr. Ruben Morawicki) in the position of assistant professor of food processing and packaging will have a significant impact on future advancement and contributions of essential programs. These two new faculty will substantially strengthen organization and research capabilities of UA food safety

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programs and add expertise in food processing and packaging that are critical to food science and technology educational, discovery and outreach advancements.

Significant achievement was accomplished in expanding and renovating the Food Science building during 2005, which will allow integration of new programs and improving current activities. When completed by the end of FY06, the Food Science building will have four new research laboratories and instrumentation rooms, additional faculty and staff offices, a new conference/teaching room, a 'state of the art' sensory science facility and a maintenance/repair shop. Development of the new sensory facility more than doubled the previous capacity, which was critically needed to address research and service requests. The additional lab and office facilities will provide space for new programs. Other facility changes that will assist with energy efficiency installation of new ceiling insulation in the food processing pilot plant and replacement windows in section A of the Food Science building

Revising the FDSC PhD program requirements for admission and completion was another significant achievement. The revisions substantially improve the quality of the doctoral program and national competitiveness to recruit highly qualified students to study for their PhD degrees in FDSC.

During 2005, the Food Science faculty continued their commendable achievement of securing external grant support to finance research and outreach, graduate assistantships and employment of support personnel and accomplishing a high level of research productivity. Recognition of faculty for their accomplishments were particularly significant during FY06 with Dr. Siebenmorgen being selected as a Fellow and appointed to University Professor and Dr. Hettiarchchy's appointment to the position of University Professor. In addition, Dr. Hettiarchchy received the AFLS outstanding teaching in recognition of her outstanding teaching contributions.

Improvements were accomplished in student recruiting and advising, which have positively impacted enrollment and retention of qualified students. Also, changes that were implemented in 2004 in administration of FDSC internships, Food Science Orientation and exit interviews, were further revised to improve student education and experiences associated with Food Science.

Improvements were made in extracurricular student learning activities which resulted in participation of students from several disciplines in the UA Food and Beverage Innovations Competition and active engagement of student participation in Ozark-section Institute of Food Technologist programs. In addition, improvements were made in the Career Development Education in Food Science program for Arkansas high school students and the Food Science in the Classroom workshop for high school teachers. These initiatives appear to be having a significant impact on student recruitment, retention and overall recognition of Food Science.

B. Assessment of Effectiveness

The Department of Food Science was highly effective in advancing knowledge and technologies through research programs, educating undergraduate and graduate students and serving the food industry and public through outreach programs. Productivity and overall effectiveness of research, teaching and outreach programs continued to improve during 2005.

Specific indicators of effectiveness were demonstrated by faculty, student and support personnel accomplishments and associated impact. During 2005, Food Science faculty, research support staff and students published 4 book chapters, 43 national refereed articles, 27 state/regional articles, and give 64 presentations at national and international conferences with several of these being invited. In addition faculty contributed 13 Impact Statements based on AAES supported research. Several faculty members worked closely with food companies, providing outreach services and transfer of information as well as problem solving research. Grant support to address research subjects also served as an indicator of effectiveness. Considerable faculty time and effort was given to securing external research grants and Food Science faculty members were highly effective in 2005, receiving approximately \$2.15 million dollars from granting agencies. While benchmark data are not available for comparisons, research productivity and effectiveness of Food Science faculty based on appointment FTE exceed those of peer departments and institutions.

Important indicators of faculty effectiveness are through professional recognitions such as invitations to contribute to prestigious national or international events, selection for awards and appointments. In FY06, FDSC faculty members were recipients of all of these recognitions with some faculty receiving multiple recognitions for their outstanding contributions.

Effectiveness and productivity associated with academic programs were exceptional during 2005. Overall quality of students recruited to FDSC undergraduate and graduate programs continued to improve. Particularly notable was the ability to sustain undergraduate student enrollment through effective efforts given to recruiting qualified students and successful retention of students in Food Science. Another major indicator of FDSC academic program effectiveness was the success of graduates in securing employment directly associated with their professional career goals, which continued to be outstanding.

The Food Science undergraduate curriculum meets the national standards required by the Institute of Food Technologist. The requirements have been changed since our program was approved to focus on student achievement of competencies rather than courses in the curriculum. Adjustments have been made along with an assessment plan, which are expected to be approved. Meeting the national academic standards is a critically important indicator of program effectiveness and the

implementation of appropriate assessment of student learning and achievement of expected competencies will serve as a guide for improving effectiveness. To assess learning outcomes, faculty are required to identify specific outcomes for all subject areas taught and construct appropriate methods to assess level of learning. In addition, exit interviews are held with each student that includes a comprehensive questionnaire to evaluate learning of core competencies.

III. Achievements in Teaching, Research and Public Service

A. Teaching and advising

To implement IFT committee of higher education standards of our undergraduate academic program, faculty revised and standardized course syllabi, identified competencies and level of each competency that students are expected to achieve and described methods used to assess learning outcomes. A series of meetings were held to discuss the new national requirements, which along with preparation of the document, stimulated and elevated faculty awareness and engagement toward effective teaching to achieve student learning. While this initiated a strong foundation, a substantial amount of work was required to maintain and advance the momentum focused on student learning through improvement of assessment procedures, course content and teaching.

During 2005, Cathy Hamilton continued responsibilities of advising and curriculum management as well as development of the new 8-semester curriculum plan. Through Ms. Hamilton's dedication to students' education and careful attention to specific details required for student degree program planning and scheduling, major improvements have been implemented. Skillful advising substantially improved student retention and contributed to student recruitment. In addition, students were assigned to a faculty member who served as mentor during the academic year. The main problem with the faculty mentor program was that many students did not participate.

Major improvements were made in management of internship applications and placements. Procedures and requirements were development as an internship guide for students by Ms. Hamilton that will improve students' internship experience and their reports.

Faculty members, Hettiarchchy, Howard and Wang served as advisors to four honors student research projects.

Through efforts of Dr. Andy Proctor an international inter-institutional educational program was coordinated for UA graduate student studies. The program funded by the Department of Education and the European Union involves study at EU institutions and exchange of UA and EU graduate students.

A total of 46 undergraduate, 19 MS and 18 PHD students were enrolled in FDSC in 2005. Undergraduate enrollment was maintained at the level achieved last year. The number of students (27) earning degrees in FDSC during FY06 was notably high.

B. Achievements in Research or Creative Activity

Research productivity by Food Science faculty and research support personnel was substantial during 2005 through 25 AAES projects. Research projects focus on a wide-range of subjects with emphasis on pre-harvest practices, post-harvest handling and storage, microbial food safety, processing, quality enhancement, chemistry and biochemistry of food carbohydrates, lipids, proteins and phytonutrients, sensory evaluation and analysis, product development and waste utilization. Advancements were accomplished in all research areas through support of grants secured through sources such as the national competitive USDA-NRI, Arkansas Bioscience Institute, USDA Food Safety Consortium, commodity promotion boards, the Institute of Food Science and Engineering and food companies. Approximately \$2.15 million dollars were obtained from granting sources by the Food Science faculty to support their research programs.

Patent applications were submitted by Drs. Hettiarchy and Meullenet for inventions important to the food industry fermentation to produce value added products and analysis of meat texture, respectively.

Specific research accomplishments are illustrated in the extensive list of research publications and presentations contributed by Food Science faculty and Research Support Personnel.

C. Public Service

The Department of Food Science actively contributes to public service through several outreach programs ranging from short communications for addressing minor questions of the general public to major conferences and services focused on assistance and information transfer for food industries. The primary emphasis of Food Science outreach programs is providing assistance to food companies through education, problem solving and advancement of technology for efficient, safe and effective production of foods. In addition to a full-time Cooperative Extension Service (CES) faculty member with specialization in food processing, all Food Science faculty contribute to outreach service. Particularly notable public service outreach contributions are through food industry-based programs such as the Sensory Evaluation Service Center, Product Evaluation Program, Rice Processing Program, Grapes and Enology Program and the Food Safety Program. The Rice Processing Program directed by Dr. Siebenmorgen and the Institute of Food Science and Engineering and Ozark Food Processors, directed by Dr. Morris provide periodic newsletters and an annual meeting for distributing science-based information to supporting industry members. Another important contribution to public service was through CES/IFSE, which organized workshops on food

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labeling, biosecurity and good manufacturing practices during 2005 for the food industry.

A workshop on Food Science in the Classroom was held for high school teachers by the Food Science faculty. Enrollment consisted of 30 high school teachers from throughout Arkansas. A Career Development Event competition was organized and managed for 11 teams of high school student. Also, the Department of Food Science implemented sponsorship of the annual World Food Day Teleconference for the public in 2005.

Dr. Hettiarchy coordinated another successful program for MasterFoods-IFT sponsored students during 2005. This program focuses on increasing student diversity in FDSC graduate studies by offering summer research experience to under-represented undergraduate students.

Food Science faculty members actively participate and contribute leadership to departmental, college, university and professional organization committees and functions including national review panels and editorial boards.

Public Services to Department, College, University and Community 2005-2006

	AEAB	AEED	ANSC	BAEG	CSES	ENTO	FDSC	HESC	HORT	PLPA	POSC
Committee Chair							8				
Committee Member							20				
Invited Seminars/ Speakers							10				
Editor							3				
Judges or Consultants							4				
Grant Reviewers							6				
Journal Reviewers or Editors							24				
Research Reviewers							10				
Professional Session Chair							4				
Service							30				

D. Faculty and Staff Awards/Notable Recognitions

Faculty Awards/Recognitions – 2005:

Dr. Pam Brady

FDSC Distinguished Teaching Achievement Award

Dr. Navam Hettiarachchy, Professor

IFT College Bowl Team Coach

Coordinator of Masterfoods Minority Student Summer Research

Recognition of Honors College Outstanding Teaching and Advising

Bumpers College Exceptional Service

John W. White Outstanding Teacher Award

Dr. Luke Howard, Professor

John W. White Outstanding Team Award

Dr. Michael Johnson, Professor

Distinguished Service Award from Food Microbiology Division of IFT

Outstanding Division Member Award from Food Microbiology Division
of IFT

Dr. Jean-Francois Meullenet, Associate Professor

Graduate Program Coordinator

FDSC Outstanding Teaching Award

Coordinator of Sensory Analysis Center

FDSC Outstanding Faculty Award

Food Science Club Advisor

Dr. Justin Morris, Distinguished Professor

Executive Vice President of Ozark Food Processors

Director of Institute of Food Science and Engineering

Dr. Andy Proctor, Professor

FDSC Outstanding Educational Program Initiative Award

Dr. Terry Siebenmorgen, Professor

Appointed to University Professor

Inductee- Arkansas Academy of Biological & Agricultural Engineering

Inductee- Fellow of the American Society of Agricultural Engineers

FDSC Outstanding Research Award

Coordinator of Rice Processing Program

Support Personnel Awards/Recognitions/Promotions:

Dr. Rusty Bautista, FDSC Outstanding Post-Doctoral Associate Award
Ms. Cindi Brownmiller, FDSC Outstanding Program Associate Award
Ms. Susan Cannon, FDSC Outstanding Departmental Program Support Award
Ms. Arnelia Couch, FDSC Outstanding Program Technician Award
Ms. Cathy Hamilton, UA Employee of the Quarter Award
Ms. Cathy Hamilton, FDSC Outstanding Program Associate Award
Ms. Cathy Hamilton, Promoted to Program Associate II
Mr. Ronny Horax, FDSC Outstanding Program Technician Award
Dr. Henry Lam, FDSC Outstanding Post-Doctoral Associate Award
Mr. David Mitchell, FDSC Outstanding Departmental Service Award
Mr. Chris Petre, FDSC Outstanding Departmental Service Award

Faculty and Staff – Changes

Ms. Brenda Wheat, Secretary II resigned
Ms. Tamara Reith, new Secretary II
Dr. Steven Ricke- new faculty- Buddy Wray Endowed Chair, Professor of Food Safety and Director of the Center for Food Safety
Dr. Ruben Morawicki-new faculty- Assistant Professor with specialization in food processing and packaging
Ms. Vesela Chalova-Zhekova- new Post Doctoral Associate with Dr. Steven Ricke

IV. Achievements of Students and Alumni

A. Significant Achievements of Food Science Graduate and Undergraduate Students

Student Authored Publications and Presentations

- **Adams, B.T.**, T. Sivarooban, N.S. Hettiarachchy, and M.G. Johnson. 2005. Inhibitory activity against *Listeria monocytogenes* by soy-protein edible film containing grape seed extract, nisin, and malic acid. *Discovery* 6:3-9.
- **Alpers, T.K.**, J.-F. Meullenet, and R. Xiong. 2005. A novel density plot method for determining the optimal sensory profile of vanilla ice cream from an internal preference map. IFT Annual Meeting Book of Abstract, New Orleans, LA.
- **Cameron D.K.**, Y.J. Wang. 2005. A better understanding of the factors that affect the hardness and stickiness of long-grain rice. *Cereal Chem.* 82:113-119.
- **Cheatham, B.** and J-F. Meullenet. 2005. Prediction of the tenderness of cooked pectoralis major muscles from near-infrared reflectance analysis of raw meat. *Inquiry* 6, 92-96.
- **Davis, A.**, N.S. Hettiarachchy, T. Sivarooban, and M.G. Johnson. 2005. Pretreated heat-stabilized defatted rice bran (HDRB) as growth medium for

yeast fermentation. IFT Annual Meeting and Food Expo, New Orleans, Louisiana. July 15-20.

- **Eswaranandam, S.**, N.S. Hettiarachchy, and M.G. Johnson. 2005. Effect of UV irradiation on tensile strength and anti-*Listeria*, anti-*Salmonella* and anti-*E. coli* O157:H7 activities malic/lactic acid incorporated soy protein films. IFT Annual Meeting and Food Expo, New Orleans, Louisiana, July 15-20.
- **Feliz, D.J.**, A. Proctor, M.A. Monsoor, and R.L. Eason. 2005. The effects of damage kernel caused by combine harvester settings on milled rice free fatty acid levels. *J Food Sci.* 70:376-379.
- **Finney, M.** and J-F. Meullenet. 2005. Biting velocities, perceived hardness and instrumental imitative measures of gelatin gels texture. 6th Pangborn Sensory Science Symposium, Harrogate, UK.
- **Finney, M.**, and J.F. Meullenet. 2005. Measurement of biting velocities, and pre-determined and individual crosshead speed instrumental imitative tests for predicting sensory hardness of gelatin gels. *J Sensory Studies* 20(2):114-129.
- **Gangidi, R.R.**, A. Proctor, F.W. Pohlman, J.F. Meullenet. 2005. Rapid determination of spinal cord content of ground beef by near-infra red spectroscopy. *J Food Sci.* 70:397-400.
- **Hager, T.**, L.R. Howard, and J.R. Clark. 2005. Polyphenolic composition and antioxidant capacity of blackberries as affected by maturity stage. Abstract 18E-2. Institute of Food Technologists Annual Meeting, New Orleans, LA. July.
- **Han, A.**, W.K. Chung and J-F. Meullenet. 2005. Comparison of instrumental tests for the assessment of cooked rice texture and their correlation to sensory profiles. 2004 AAES B.R. Wells Rice Research Studies, 387-394.
- **Horax, R.**, N.S. Hettiarachchy, M. Jalaluddin, and R.S. Walnofer. 2005. Phenolic composition, antioxidant, and antimutagenic activities of bitter melon (*Momordia charantia* Linn.) extracts from various solvents. IFT Annual Meeting and Food Expo, New Orleans, Louisiana. July 15-20.
- **Landerito, N.A.** and Y.-J. Wang. 2005. Preparation and properties of starch phosphates using eaxy common, and high-amylose corn starches. I. Oven-Heating Method. *Cereal Chem.* 82(3):264-270.
- **Landerito, N.A.** and Y.-J. Wang. 2005. Preparation and properties of starch phosphates using waxy, common, and high-amylose corn starches. II. Reactive Extrusion Method. *Cereal Chem.* 82(3):271-276.
- **Lungu, B.**, and M.G. Johnson. 2005. Fate of *L. monocytogenes* inoculated onto the surface of model turkey frankfurter pieces treated with zein coatings containing nisin, sodium lactate and sodium diacetate at 4°C. *J. Food Protect.* 68(4):855-859.
- **Lungu, B.**, and M.G. Johnson. 2005. Potassium sorbate does not increase control of *l. monocytogenes* when added to zein coatings with nisin on the surface of full fat turkey frankfurter pieces in a model system at 4°C. *J. Food Sci.* 70(2):95-99.
- **Pandjaitan, N.**, L.R. Howard, T. Morelock, and M.I. Gil. 2005. Antioxidant capacity and phenolic content of spinach as affected by genetics and maturation. *J Agric. Food Chem.* 53:8618-8623.

- **Piland, D.**, L.R. Howard and J.R. Clark. 2005. Effect of harvest data on total anthocyanins, total phenolics, antioxidant capacity and berry weight in blueberry genotypes. Abstract 36E-70. IFT Annual Meeting, New Orleans, LA. July.
- **Saleh, M.** and J-F Meullenet. 2005. Changes in the pasting properties of rice constituents during storage. 2004 AAES B.R. Wells, Rice Research Studies, 405-412.
- **Schluterman, D.** and T.J. Siebenmorgen. 2005. Incorporating glass transition concepts to explain rice milling quality reductions during the drying process. Discovery 6:29-37.
- **Schluterman, D.A.**, Siebenmorgen, T.J., and D.M. Bowman. 2005. Relating rough rice moisture content removal and tempering duration to head rice yield reduction. ASABE Paper No. 056003. Tampa, FL. July 17-20.
- **Sivarooan, T.**, N.S. Hettiarachchy, and M.G. Johnson. 2005. Inhibition of *Listeria monocytogenes* by nisin combined with grape seed extract or green tea extract in soy protein film coated on turkey frankfurters. J Food Sci. JFS MS-JFS-2005-0382. R2.
- **Sivarooan, T.**, N.S. Hettiarachchy, B. Adams, and M.G. Johnson. 2005. Anti-*Listerial* activities of soy protein edible film coating containing grape seed extract (GSE), Nisin and EDTA and their combinations on full fat turkey frankfurters stored at 4°C and 10°C. IFT Annual Meeting and Food Expo, New Orleans, Louisiana. July 15-20.
- **Sivarooan, T.**, N.S. Hettiarachchy, S. Elser, and M.G. Johnson. 2005. Inhibitory effect of green tea extract (GTE) against *L. monocytogenes* on the surface of cooked Ready-To-Eat chicken breast meat stored at 4°C. IFT Annual Meeting and Food Expo, New Orleans, Louisiana. July 15-20.
- **Tran, K.H.**, N.S. Hettiarachchy, and S. Eswaranandam. 2005. Effect of malic acid incorporated carboxymethyl cellulose and soy protein isolate film coatings on the color of alfalfa and mung bean sprouts on storage at 4°C. IFT Annual Meeting and Food Expo, New Orleans, Louisiana. July 15-20.
- **Tran, K.H.**, N.S. Hettiarachchy, and S. Eswaranandam. 2005. Textural properties of malic acid incorporated carboxymethyl cellulose and soy protein isolate coatings on alfalfa and mung bean sprouts on storage at 4°C. IFT Annual Meeting and Food Expo, New Orleans, Louisiana. July 15-20.
- **Walnofer, R.S.**, N.S. Hettiarachchy, and R. Horax. 2005. Effects of heating on hydrophobicity, viscosity, and gelling properties of soy products. Discovery 6:38-44.
- **Watson, N.**, T.J. Siebenmorgen, and P.A. Counce. 2005. Effects of nighttime temperature during grain filling on rice processing quality. Poster of the AACC Annual Meeting, Orlando, FL. Sept. 11-14.
- **Watson, N.T.**, P.A. Counce, and T.J. Siebenmorgen. 2005. Growth stages of 12 rice cultivars (*Oryza sativa* L.) expressed in DD50 thermal heat units. 2004 AAES B.R. Wells Rice Research Studies, 529:56-62.
- **Watson, N.T.**, P.A. Counce, T.J. Siebenmorgen, and K.A.K. Moldenhauer. 2005. Explaining head rice yield variation using historical weather data. 2004 AAES B.R. Wells Rice Research Studies, 529:425-432.

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- **Webber, D.**, N. Hettiarachchy, R. Horax, R. McNew, M. Jalaluddin, P. Chen. Extraction, optimization, characterization, and antioxidant capacity of phenolics from cowpea (*Vigna unguiculata*). The Sixth International Conference and Exhibition on Nutraceuticals and Functional Foods. Anaheim, San Francisco, CA. October 16–19.
- **Webber, D.M.**, N.S. Hettiarachchy, R. Horax. 2005. The effectiveness of various solvents in the extraction of phenolic acids from cowpea. IFT Annual Meeting and Food Expo, New Orleans, Louisiana. July 15-20.

Student Research Paper Competition Awards

- 1st place Tabra Alpers, M.S., 2005 IFT Annual Meeting Graduate Oral Research Paper Competition.
- 2nd place Vishal Jain, M.S., 2006 Gamma Sigma Delta Masters Oral Paper Competition; 1st place, 2006 Gamma Sigma Delta Masters Poster Competition.
- 3rd place Daniel Webber; M.S., 2006 Gamma Sigma Delta Masters Oral Paper Competition.
- 3rd place Sivarooban Theivendran, Ph.D., 2006 Gamma Sigma Delta PhD Oral Paper Competition.
- 1st place Daris Kuakpetoon Ph.D., 2005 poster presentation by Corn Refiners Association at the AACCC International Annual Meeting in Orlando, Florida.

Student Product Development Competition Award

- 2nd place, Cilantro Pesto Sauce, Kenneth Over and Vishal Jain, 2006 Food and Beverage Innovations Competition.

Student College Bowl Team Competition

- UA Food Science College Bowl team: Brittany Adams, Ken Over, Michael Kaminski (undergraduate students), Vishal Jain, Daniel Webber (MS students), and Arvind Kannan (PhD student) won 1st place in South-Central Regional Competition. The team will be competing for the national championship at the Annual IFT Meeting June 24-28, 2006 in Orlando, FL.

Student Research Grants

- Brittany Adams, Bumpers College Undergraduate Research Grants.

Student Scholarships and Fellowships

- Sixteen undergraduate student scholarships were awarded by the Department of Food Science for the total amount of \$10,650. An additional seventeen scholarships in the total amount of \$22,250 were awarded by outside organizations supporting education in the field of Food Science.
- Doctoral Academy Fellowships - Tiffany Hager, Devon Cameron and Ken Over

Student Involvement Including Internships

- FDSC Club Officers: Brittany Adams (undergraduate student), President; Christy Adams (MS student), Vice President; Josh Saldivar (MS student), Treasurer; Lydia Rice (undergraduate student), Secretary; Erik Friedly (MS student), Auxiliary Officer.
- Bumpers College Ambassadors: Suzanne Elser, Senior Ambassador
- Internships: Suzanne Elser – Simmons Foods, Siloam Springs, AR; Elizabeth Watkins – Cargill Value Added Meats, Springdale, AR; David Perez – Wal-Mart Quality Assurance, Bentonville, AR; Alicia Yancey – Wal-Mart Food Safety & Security, Bentonville, AR; Kerry Spurlock – Wal-Mart Product Development, Bentonville, AR; Brittany Adams – Food Industry Foundation, Edinburgh, Scotland.
- Study Abroad: Marianne Rice – University of Graz, Graz, Austria (Fall 05 and Spring 06); Brett Helms – University of Queensland, Brisbane, Australia (Fall 05); Cecilia Gonzalez – Bumpers College Honors Study Tour, Scotland; Devon Cameron (PhD student) – University of Graz, Graz, Austria (Fall 05); Caroline Lovely – University of Gent, Belgium and Toulouse, France; Tabra Alpers – Budapest, Hungary

Academic Awards

- Brittany Adams, Presidential Scholar Award
- Nora Watson, Outstanding M.S. FDSC Student Award
- Vishal Jain, Outstanding M.S. FDSC Student Award
- Ilankovan Paraman, Outstanding FDSC Ph.D. Student Award
- Tiffany Hager, Outstanding FDSC Ph.D. Student Award
- Emily Bennett, Outstanding FDSC Senior Award
- Susanne Elser, Outstanding FDSC Senior Award

Academic Achievements

- Chancellor's List – 5 students Fall 05, 5 students Spring 06
Dean's List – 3 students Fall 05, 7 students Spring 06
Honor Roll – 4 students Fall 05, 4 students Spring 06
- Graduation Honors – Cecilia Gonzalez (Honors Program Distinguished Graduate), Ken Over (*summa cum laude*), Kerry Spurlock (*summa cum laude*), Emily Bennett (*magna cum laude*), David Perez (*magna cum laude*), Cecilia Gonzalez (*cum laude*), Jennifer Hall (*cum laude*), Molly Marshall (*cum laude*), Nettie Spurlock (*cum laude*), Alicia Yancey (*cum laude*).
- Degrees awarded (Summer 05, Fall 05 & Spring 06) – 17 B.S.A., 7 M.S., and 3 Ph.D.

V. Significant Achievements of Food Science Graduates

Food Science graduates continued to demonstrate successful careers through their promotions and advancement in their professions. This year an alumnus was honored by the Bumpers College by being selected as the 2006 Outstanding Alumnus for his service contributions and professional achievement.

- Don McCaskill, 2006 Outstanding Alumnus (received MS degree 1972)

A. Career Opportunities for Graduates

Graduates have successfully secured employment or acceptance to graduate studies following their graduation from Food Science. Employment opportunities continue to be abundant for Food Science graduates. The Institute of Food Technologists provides data from annual surveys on employment and salaries of Food Scientists based on types of positions and regions of the country. The national, state and local projections for employment opportunities of FDSC graduate are very positive. Currently there are more employment opportunities than there are graduates.

VI. Publications

A bibliographic listing of 2005 publications and presentations contributed by the Food Science Faculty, research support personnel and students are as follows and are also submitted as an electronic file:

Bibliographic Listing of FDSC 2005 Publications and Presentations

A. Book Chapters:

Hettiarachchy, N. and S. Eswaranandam. 2005. Edible films: Physical and mechanical properties, edible films and coatings from soy bean and other protein sources. Wiley & Sons. Pp. 371-387.

Morris, J.R. and P.L. Brady. 2005. Temperature effects on produce degradation. In: Produce Degradation: Pathways and Their Prevention, O. Lamikanra (Ed.) CRC Press, Boca Raton, FL. Pp 599-647.

Morris, J.R. and R.K. Striegler. 2005. Grape juice: Factors that influence quality, processing technology, and economics. In Processing Fruits: Science and Technology, 2nd Ed. D.M. Barrett, L. Somogyi, and H. Ramaswamy eds. CRC Press, Boca Raton, FL. Pp. 585-616.

Proctor, A. and D.D. Brooks. Chapter: Adsorptive separation of oils. In Baileys Oils and Fats Products. Ed. 6th Edition. John Wiley Publishers. Pg. No. 267-284.

B. Referred Journal Articles:

Bautista, R.C. and T.J. Siebenmorgen. 2005. Individual rice kernel moisture content variability trends. Applied Engineering in Agriculture 21(4):637-643.

Bautista, R.C., T.J. Siebenmorgen, R.M. Burgos, and A. Mauromoustakos. 2005. Investigations of IRRI test tube mill operating parameters. *Applied Engineering in Agriculture* 21(1):105-114.

Boykin, J.C., T.S. Soerens, and T.J. Siebenmorgen. 2005. Treatment of rice cooker wastewater and recovery of by-products by membrane microfiltration. *Applied Engineering in Agriculture* 21(4):689-694.

Cameron D.K., Y.J. Wang. 2005. A better understanding of the factors that affect the hardness and stickiness of long-grain rice. *Cereal Chem.* 82:113-119.

Cavitt, L.C., J.F. Meullenet, R.K. Gandhapuneni, G.W. Youm, C.M. Owens. 2005. Rigor development and meat quality of large and small broilers and the use of Allo-Kramer shear, needle puncture, and razor blade shear to measure texture. *Poultry Sci.* 84(1):113-118.

Cavitt, L.C., J.F.C. Meullenet, R. Xiong, C.M. Owens. 2005. The relationship of razor blade shear, Allo-Kramer shear, Warner-Bratzler shear and sensory tests to changes in tenderness of broiler breast fillets. *J Muscle Foods.* 16(3):223-242.

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Siebenmorgen, T.J., G. Qin, and C. Jia. 2005. Influence of drying on rice fissure formation rates and mechanical strength distributions. *Trans. of the ASAE* 48(5):1835-1841.

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Zhu, D., N. Hettiarachchy, R. Horax, P. Chen. 2005. Isoflavone contents in germinated soybean seeds. [Plant Foods Hum. Nutr.](#) 60:147-151.

C. Non-Refereed Publications:

Bautista, R.C. and T.J. Siebenmorgen. 2005. Milling quality trends with harvest moisture content and the relationship to individual kernel moisture content distribution. *Arkansas Rice Research Studies, 2004. AES Research Series 529:364-370.*

Bautista, R.C., T.J. Siebenmorgen, A. Mauromoustakos, and R.M. Burgos. 2005. Small sample mill protocol development: Evaluation of a Genogrinder 2000. *Arkansas Rice Research Studies, 2004. AES Research Series 529:357-363.*

Bautista, R.C., T.J. Siebenmorgen, and R.M. Burgos. 2005. Moisture adsorption effects on rice milling quality of current cultivars. *Arkansas Rice Research Studies, 2004. AES Research Series 529:351-356.*

Brady, P. and J. Morris. 2005. Production and handling practices for safe produce. *AAES Research Report #978.*

Cheatham, B. and J-F. Meullenet. 2005. Prediction of the tenderness of cooked pectoralis major muscles from near-infrared reflectance analysis of raw meat. *Inquiry* 6, 92-96.

Chung, W.K., J-F. Meullenet. 2005. Prediction of cooked rice texture in long-grain rice using Rapid-Visco-Analyzer data. 2004 AAES B.R. Wells Rice Research Studies, 371-379.

Feliz, D.J., A. Proctor, M.A. Monsoor and R.L. Eason. 2005. The effects of kernel damage caused by combine harvester settings on milled-rice free fatty acid levels. *B.R. Wells Rice Studies*, p. 380-386.

Han, A., W.K. Chung and J-F. Meullenet. 2005. Comparison of instrumental tests for the assessment of cooked rice texture and their correlation to sensory profiles. 2004 AAES B.R. Wells Rice Research Studies, 387-394.

Matsler, A.L., T.J. Siebenmorgen, and A.L. Couch. 2005. Influence of kernel thickness on yellowing of rough rice. 2004 AAES B.R. Wells Rice Research Studies, 529:395-404.

Morris, J.R. 2005. Institute establishes partnerships in food processing industry. 2004 AAES B.R. Wells Rice Research Studies, 528, p. 100-101.

Morris, J.R. 2005. Mechanization system maintains quality and helps vineyards remain competitive. 2004 AAES B.R. Wells Rice Research Studies, 528, p. 44.

Morris, J.R. 2005. Successful total vineyard mechanization. *Vineyard & Winery Management*, 31(1):84-90.

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Nannapaneni, R., R. Story, K. Wiggins and M.G. Johnson. 2005. MGJ-01 ELISA reactivities of newly developed monoclonal antibody producing hybridoma clones against *Listeria monocytogenes* and *L. innocua* no starved and saline starved cells. USDA Food Safety Consortium Annual Research Meeting, Manhattan, K.S. October 2-4.

Nannapaneni, R., K.C. Wiggins, R. Story and M.G. Johnson. 2005. MGJ-02 *Listeria monocytogenes* Scott A cells starved in physiological saline for one year remain highly virulent. USDA Food Safety Consortium Annual Research Meeting, Manhattan, K.S. October 2-4.

Nannapaneni, R., R. Story, K. Wiggins and M.G. Johnson. 2005. MGJ-05 Monoclonal antibody probes to *Campylobacter jejuni*. USDA Food Safety Consortium Annual Research Meeting, Manhattan, K.S. October 2-4.

Nannapaneni, R., R. Story, K. Wiggins, and M.G. Johnson. 2005. MGJ-03 Total *Campylobacter* and total ciprofloxacin resistant *Campylobacter* loads in rinses from retail raw chicken carcasses from 2001-2004. USDA Food Safety Consortium Annual Research Meeting, Manhattan, K.S. October 2-4.

Noguera, E., J. Morris, K. Striegler, and M. Thomsen. 2005. Production budgets for Arkansas wine and juice grapes. *AR Agric. Exp. Sta. Research Report # 976*.

Noguera, E., J. Morris, K. Striegler, and M. Thomsen. 2005. Update on vineyard economics in Arkansas. *Wine East 2005 Buyer's Guide*, 12,15—25, 27-31.

Saleh, M. and J-F. Meullenet. 2005. Changes in the pasting properties of rice constituents during storage. 2004 AAES B.R. Wells, *Rice Research Studies*, 405-412.

Siebenmorgen, T.J. and R.C. Bautista. 2005. Predicting rice bulk physicochemical properties using weighted-average properties of thickness fractions. 2004 AAES B.R. Wells *Rice Research Studies*, 529:413-424.

Striegler, R.K, J.R. Morris, G.L. Main, and C.B. Lake. 2005. Effect of rootstock on fruit composition, yield, growth, and vine nutritional status of Cabernet franc. *In Grapevine Rootstocks: Current Use, Research, and Application. Proceedings of the Rootstock Symposium*. Peter Cousins and Keith Striegler (Eds.). pp. 84-93.

Watson, N.T., P.A. Counce, and T.J. Siebenmorgen. 2005. Growth stages of 12 rice cultivars (*Oryza sativa* L.) expressed in DD50 thermal heat units. 2004 AAES B.R. Wells *Rice Research Studies*, 529:56-62.

Watson, N.T., P.A. Counce, T.J. Siebenmorgen, and K.A.K. Moldenhauer. 2005. Explaining head rice yield variation using historical weather data. 2004 AAES B.R. Wells *Rice Research Studies*, 529:425-432.

D. Invited Presentations:

Scientific Meetings:

Hettiarachchy, N.S., R. Horax, and T. Rababah. International conference on “antioxidant and free radicals in health-nutrition and radio-protectors” and iv annual conference of the society for free radical research in india” (SFRR), total phenolics, phenolic acid constituents, antioxidant and antimutagenic activities of selected plant extracts including bitter melon (Bitter Gourd). St. John's National Academy of Health Sciences Bangalore, India, January 10-12.

Hettiarachchy, Navam, R. Horax and Jalaluddin Chen. 2005. Antimicrobial activities of bitter melon flesh extract. Sixth International Conference and Exhibition on Nutraceuticals and Functional foods. Anaheim, California. October 16-19.

Howard, L.R. Antioxidant Capacity and Polyphenolic Content of blueberries and blackberries as affected by genotype, maturation and growing season. 2005 International Berry Health Benefits Symposium. Corvallis, OR. June 13.

Howard, L.R. High pressure liquid extraction of flavonoids from spinach. 2005 National Spinach Conference. Fayetteville, AR. November 16.

Howard, L.R. Phytochemicals in Pepper (*Capsicum annuum* L.) Fruit. 2005 International symposium on functionalities of hot red peppers and hot sauces. Korea University, Seoul, Korea. July 1.

Howard, L.R. Pressurized hot water extraction of procyanidins from grape seeds. Green Processes for Extraction and Formulation of Phytochemical-derived Products Symposium. American Chemical Society National Meeting. Washington, DC. August 29.

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Lam, H.S., A. Proctor, and L.R. Howard. 2005. Rapid antioxidant capacity determination of fruit extracts by Fourier transform infrared spectroscopy. Annual Meeting of the American Oil Chemists Society. Salt Lake City, Utah. May 4th.

Meullenet, J-F. 2005. Developing the perfect Jasmine rice. Guest Speaker, AACC Rice Division Luncheon, Orlando, FL

Meullenet, J-F. 2005. Development of the BITE master II and its application to studies on food firmness. WCFS Food Summit: Making Sense of Food.

Meullenet, J-F. 2005. Mechanical and bio-mechanical considerations for relating sensory and instrumental measures of cheese texture. Symposium. Annual IFT Meeting, New Orleans, LA

Morris, J.R. Health values of muscadine grapes. Keynote presentation at Muscadine Grape Conference at E. Carolina State University, Conway, SC. October.

Morris, J.R. The U of A Enology and Viticulture program and its research on muscadine grapes. NC Muscadine Grape Grower's Assoc. Pine Level, NC. July.

Owens, C.M., J.M. Mehaffey, J-F.C. Meullenet, S.R. McKee, and J.L. Emmert. 2005. Evaluating the effect of shortened aging times on meat quality of breast fillets from five commercial broiler strains at 6 and 7 weeks of age. Proceedings of XVII European Symposium on the Quality of Poultry Meat & XI European Symposium on the Quality of Eggs and Egg Products. Doorwerth, The Netherlands. May 23-26.

Owens, C.M., L.C. Cavitt, J.M. Mehaffey and J-F.C. Meullenet. 2005. Tenderness assessment of commercial broilers. Proceedings of the ANECA Annual Meeting, Puerto Vallarta, Mexico. April 27-30.

Proctor, A. and V. Jain. 2005. Conjugated linoleic acid synthesis from soy oil by photoisomerization. International conference on Renewable Resources and Biorefineries. Gent, Belgium. September 21st.

Proctor, A., S.H. Lam and M. Monsoor. 2005. Impact of free fatty acid formation and off flavor formation on milled rice brewing quality. Symposium - Grain based Products: Health and Flavor and Safety Aspects (Co-sponsored by German Food Chemistry Society). Biannual Meeting of the American Chemical Society, Washington, DC. August 31st.

Proctor, A., S.H. Lam, J. Nyalala, M.D. Morris & W.G. Smith. 2005. FTIR evaluation of LDL oxidation, in the presence of flavonoids, and α -tocopherol. 2005. Annual Meeting of the American Oil Chemists Society. Salt Lake City, Utah. May 4th.

Industry or Extension Meetings:

Hettiarachchy, N.S. Development of tailor-made biodegradable film spray applications in roses. Exon Science Inc. Guei Shan County, Taoyuan, Taiwan, R.O.C. May 14.

Hettiarachchy, N.S. Development of tailor-made biodegradable film spray applications in tulips. Exon Science Inc. Guei Shan County, Taoyuan, Taiwan, R.O.C. May 14.

Hettiarachchy, N.S. Development of tailor-made biodegradable film spray applications in lilies. Exon Science Inc. Guei Shan County, Taoyuan, Taiwan,

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R.O.C. May 14.

Hettiarachchy, N.S. Development of tailor-made biodegradable film spray applications in carnation. Exon Science Inc. Guei Shan County, Taoyuan, Taiwan, R.O.C. May 14.

Hettiarachchy, N.S. Development of tailor-made biodegradable film spray applications in mums. Exon Science Inc. Guei Shan County, Taoyuan, Taiwan, R.O.C. May 14.

Hettiarachchy, N.S. I. Effect of edible film coating on the shelf-life of cut water melon pieces. Exon Science Inc. Guei Shan County, Taoyuan, Taiwan, R.O.C. May 14.

Hettiarachchy, N.S. Effect of edible film coating on mung bean and soybean sprout. Exon Science Inc. Guei Shan County, Taoyuan, Taiwan, R.O.C. May 14.

Hettiarachchy, N.S. Effect of edible film coating on the shelf-life of strawberry. Exon Science Inc. Guei Shan County, Taoyuan, Taiwan, R.O.C. May 14.

Hettiarachchy, N.S. Effect of edible film coating on the shelf-life of cut banana slices. Exon Science Inc. Guei Shan County, Taoyuan, Taiwan, R.O.C. May 14.

Hettiarachchy, N.S. Effect of film coating on the shelf-life of eggs. Exon Science Inc. Guei Shan County, Taoyuan, Taiwan, R.O.C. May 14.

Hettiarachchy, N.S. Part IV: "Solubility and emulsifying properties of rice protein hydrolysates. DSM, Switzerland. October 28.

Morris, J.R. Commercializing the M-O system. Presented for French Camp and Gallo managers Santa Margarita, CA. November.

Proctor, A. and M. Monsoor. 2005. Method Development for solvent extraction of oil from soy flour I. Harry Snyder consultant/IFSE.

Proctor, A. and M. Monsoor. 2005. Method development for solvent extraction of oil from soy flour II. Harry Snyder consultant/IFSE.

Siebenmorgen, T.J. 2005. Annual program report of the Rice Processing Program. 2005. Update of research and extension activities of the Rice Processing Program to corporate sponsors. Fayetteville.

Siebenmorgen, T.J. 2005. Factors affecting rice milling quality. RiceCap Newsletter. University of Arkansas.

Siebenmorgen, T.J. 2005. Milling quality factors. Oral presentation at the Rice Research and Extension Center Field Day. Stuttgart, AR. August 9.

Siebenmorgen, T.J. 2005. Recent drying and milling research. Presentation to representatives of Buhler. Uzwil, Switzerland. June 9.

Siebenmorgen, T.J. 2005. Summary of research on degree of milling assessment. Presentation to representatives of the rice milling industry and the Grain Inspection, Packers, and Stockyards Administration. Kansas City, MO. March 23.

Siebenmorgen, T.J. 2005. Update of research being conducted in the U of A Rice Processing Program. Presentation to the Annual Convention of the Arkansas Driers and Warehousemen's Assoc. Tunica, MS. February 25.

Siebenmorgen, T.J. 2005. University of Arkansas Rice Processing Program Research Update Series. 2004. These are quarterly research reports sent to corporate sponsors of the Rice Processing Program.

E. Presentations and Abstracts (National/International Meetings):

Alpers, T.K., J.-F. Meullenet, and R. Xiong. 2005. A novel density plot method for determining the optimal sensory profile of vanilla ice cream from an internal preference map. IFT Annual Meeting Book of Abstract, New Orleans, LA.

Bautista, R.C., T.J. Siebenmorgen, and R.M. Burgos. 2005. Water absorption effects on milling quality of thickness fractionated rough rice. ASABE Paper No. 056200. Tampa, FL. July 17-20.

Bautista, R.C., T.J. Siebenmorgen, A. Mauromoustakos, and R. Burgos. 2005. Evaluation of a Genogrinder 2000 for milling small brown rice samples. Poster of the AACC Annual Meeting, Orlando, FL. Sept. 11-14.

Bautista, R.C., T.J. Siebenmorgen, and R. Burgos. 2005. Water absorption effects on milling quality of thickness fractionated rough rice. Presentation at the AACC Annual Meeting, Orlando, FL. Sept. 11-14.

Brownmiller, C.R. and L.R. Howard. 2005. Polyphenolic composition and antioxidant capacity of canned blueberries. Abstract 36E-12. Institute of Food Technologists Annual Meeting. New Orleans, LA. July.

Cho, M.J. and L.R. Howard. 2005. Flavonoid content and antioxidant capacities of selected spinach genotypes determined by high-performance liquid chromatography/mass spectrometry. Abstract 54G-25. Institute of Food Technologists Annual Meeting. New Orleans, LA. July.

Chung, W.K., A. Han, J-F. Meullenet and D. Schluterman. 2005. Effect of infra-red treatment on rice functionality. Presentation to AACC 2005, Orlando, FL.

Chung, W.K., J-F. Meullenet, and A. Han. 2005. Alpha-amylase activity assessment by a Rapid Visco-Analyzer. IFT Annual Meeting Book of Abstract, New Orleans, LA.

Davis, A., N.S. Hettiarachchy, T. Sivarooban, and M.G. Johnson. 2005. Pretreated heat-stabilized defatted rice bran (HDRB) as growth medium for yeast fermentation. IFT Annual Meeting and Food Expo, New Orleans, Louisiana. July 15-20.

Eswaranandam, S., N.S. Hettiarachchy, and M.G. Johnson. 2005. Effect of UV irradiation on tensile strength and anti-*Listeria*, anti-*Salmonella* and anti-*E. coli* O157:H7 activities malic/lactic acid incorporated soy protein films. IFT Annual Meeting and Food Expo, New Orleans, Louisiana, July 15-20.

Finney, M. and J-F. Meullenet. 2005. Biting velocities, perceived hardness and instrumental imitative measures of gelatin gels texture. 6th Pangborn Sensory Science Symposium, Harrogate, UK.

Gandhapuneni, R.K. and J-F. Meullenet. 2005. BITE Master II: A tool to study the perception of cheese firmness. 6th Pangborn Sensory Science Symposium, Harrogate, UK.

Hager, T., L.R. Howard, and J.R. Clark. 2005. Polyphenolic composition and antioxidant capacity of blackberries as affected by maturity stage. Abstract 18E-2. Institute of Food Technologists Annual Meeting, New Orleans, LA. July.

Hettiarachchy, N.S. 2005. Rice endosperm proteins modification and functional properties. DSM, Switzerland, August 15-17.

Horax, R., N.S. Hettiarachchy, M. Jalaluddin, and R.S. Walnofer. 2005. Phenolic composition, antioxidant, and antimutagenic activities of bitter melon (*Momordia charantia* Linn.) extracts from various solvents. IFT Annual Meeting and Food Expo, New Orleans, Louisiana. July 15-20.

Howard, L.R. 2005. Antioxidant capacity and polyphenolic content of blueberries and blackberries as affected by genotype, maturation and growing season. Proceedings of the International Berry Health Benefits Symposium, Abstract. Corvallis, OR. June.

Howard, L.R. 2005. Phytochemicals in *Capsicum annum* L. fruit. 2005 Proceedings of the International Symposium on Functionalities of Hot Red Peppers and Hot Sauces, Abstract, Seoul, Korea. July.

Howard, L.R. and Z.Y. Ju. 2005. Pressurized water extraction of procyanidins from grape seeds. Abstract 0067. American Chemical Society National Meeting, Washington, DC. August.

Huff, G., W.E. Huff, N.C. Rath, M.G. Johnson, and R. Nannapaneni. 2005. Chronic sequelae of *L. monocytogenes* respiratory infection of turkey poults and implication of biofilm involvement. ASM General Meeting, Atlanta, GA. Abstr. No. P 097, p. 457. June 5-9.

Jain, V. and A. Proctor. 2005. Conjugated linoleic acid synthesis from soy oil by photoisomerization. IFT Annual Meeting. New Orleans, LA. July 19th.

Kuakpeeton, D., Y-J. Wang. 2005. Locations of hypochlorite-oxidation within corn starch granules with different amylose contents, AACC annual meeting, Orlando, FL. (poster).

Lam, H.S., A. Proctor and L.R. Howard. 2005. Rapid antioxidant capacity determination of fruit extracts by fourier transform infrared spectroscopy. AOCS Annual Meeting, Abstract. Salt Lake City, UT. May.

Lam, H.S., A. Proctor, J. Nyalala, M.D. Morris, and G.W. Smith. 2005. Fourier transform infrared spectroscopy evaluation of low density lipoproteins oxidation in the presence of quercetin, catechin, and alpha-tocopherol. IFT Annual Meeting. New Orleans, LA. July 18th.

Lungu, B., and M.G. Johnson. 2005. Control of *L. monocytogenes* on raw or cooked ground white or dark turkey meat using nisin, sodium diacetate and sodium lactate. ASM General Meeting, Atlanta, GA. Abstr. No. P. 029, p. 443. June 5-9.

Main, G.L. and J.R. Morris. 2005. Influence of macerating enzymes and grape seed tannin on color extraction and retention in Cynthiana wine. Am. J. Enol. Vitic. 56(4):419A. Abstract.

Mehaffey, J.M., A. Saha, J.F. Meullenet, and C.M. Owens. 2005. Bone strength of clavicles from four commercial high yielding broiler strains. Poultry Sci. 84:19 (Suppl.1) (Abstr.)

Meullenet J-F., R. Xiong, and T. Alpers. 2005. A mapping method for determining optimum sensory profiles. 6th Pangborn Sensory Science Symposium, Harrogate, UK.

Meullenet, J-F., R. Xiong, A. Saha and C.M. Owens. 2005. Novel shape profiling method for classifying tender and tough broiler breast meat. IFT Annual Meeting Book of Abstract, New Orleans, LA.

Meullenet, J-F. 2005. Mechanical and bio-mechanical considerations for relating sensory and instrumental measures of cheese texture. IFT Annual Meeting, Book of Abstract, New Orleans, LA.

Monsoor, M., A. Proctor, R. Liyange and J. Lay. 2005. Effect of frying oil quality and frying time on the acrylamide content of fried foods. IFT Annual Meeting. New Orleans, LA. July 18th.

Monsoor, M.A., and A. Proctor. 2005. Aqueous extraction of rice bran emulsified oil and the oxidative stability of rice bran. Annual Meeting of the American Oil Chemists Society. Salt Lake City, Utah. May 4th.

Morris, J.R. and G.L. Main. 2005. Evaluation of mechanical pruning on Cynthiana grape and wine composition. Presented at the Amer. Soc. Enol. Vitic., 56th Annu. Mtg, Seattle, WA, June.

Morris, J.R. 2005. University of Arkansas Division of Agriculture, IFSE. SERA014 Viticulture and Enology Research Reports. pp. 2-14.

Morris, J.R. and G.L. Main. 2005. Evaluation of mechanical pruning on Cynthiana grape and wine composition. Am. J. Enol. Vitic. 56(3):304A. Abstract.

Morris, J.R., G.L. Main, and R.K. Striegler. 2005. Rootstock effects on sunbelt productivity and fruit composition. In Grapevine Rootstocks: Current Use, Research, and Application. Proceedings of the 2005 Rootstock Symposium. Peter Cousings and Keith Striegler (eds.). pp. 77-83.

Nannapaneni, R., K.C. Wiggins, R. Story, A.F. Mendonca, and M.G. Johnson. 2005. *Listeria monocytogenes* Scott A cells starved in physiological saline for one year remain highly virulent. ASM General Meeting, Atlanta, GA. Abstr. No. P. 096, p. 456-457. June 5-9.

Nannapaneni, R., R. Story, K.C. Wiggins, and M.G. Johnson. 2005. Development of new monoclonal antibody probes for *Campylobacter jejuni*. IFT Meeting. New Orleans, LA. Abstr. No. 18D-10. July 16-20.

Nannapaneni, R., R. Story, K.C. Wiggins, and M.G. Johnson. 2005. Highly Virulent *Campylobacter jejuni* in Retail Raw Chicken Carcass Rinses. IAFP Meeting. Baltimore, MD. Abstr. No. P5-35. August 14-17.

Nannapaneni, R., R. Story, K.C. Wiggins, and M.G. Johnson. 2005. Development of a new monoclonal antibody probe specific for *Campylobacter jejuni*. ASM General Meeting, Atlanta, GA. Abstr. No. P. 069, p. 451. June 5-9.

Nannapaneni, R., R. Story, K.C. Wiggins, J. Saldivar, and M.G. Johnson. 2005. Total campylobacter and total ciprofloxacin-resistant *Campylobacter* loads in rinses from retail raw chicken carcasses from 2001 to 2004. ASM General Meeting, Atlanta, GA. Abstr. No. P. 068, p. 451. June 5-9.

Patindol, J., Y-J. Wang, N. Phoumivong. 2005. Composition and properties of the different fractions obtained in the preparation of rice starch by alkaline steeping, AACCC annual meeting, Orlando, FL. (poster).

Piland, D., L.R. Howard and J.R. Clark. 2005. Effect of harvest data on total anthocyanins, total phenolics, antioxidant capacity and berry weight in blueberry genotypes. Abstract 36E-70. IFT Annual Meeting, New Orleans, LA. July.

Saleh, M.I., J-F. Meullenet, T.J. Siebenmorgen, and L. Wang. 2005. Effect of moisture content at harvest of various kernel thickness fractions on rice instrumental texture properties. IFT Annual Meeting Book of Abstract, New Orleans, LA.

Schluterman, D.A., T.J. Siebenmorgen, and D.M. Bowman. 2005. Relating rough rice moisture content removal and tempering duration to head rice yield reduction. ASABE Paper No. 056003. Tampa, FL. July 17-20.

Siebenmorgen, T.J. 2005. Recent advances in rice drying technology. Invited presentation at the Rice Division Symposium at the AACC Annual Meeting, Orlando, FL. Sept. 11-14.

Sivarooban, T., N.S. Hettiarachchy, B. Adams, and M.G. Johnson. 2005. Anti-*Listerial* activities of soy protein edible film coating containing grape seed extract (GSE), Nisin and EDTA and their combinations on full fat turkey frankfurters stored at 4°C and 10°C. IFT Annual Meeting and Food Expo, New Orleans, Louisiana. July 15-20.

Sivarooban, T., N.S. Hettiarachchy, S. Elser, and M.G. Johnson. 2005. Inhibitory effect of green tea extract (GTE) against *L. monocytogenes* on the surface of cooked Ready-To-Eat chicken breast meat stored at 4°C. IFT Annual Meeting and Food Expo, New Orleans, Louisiana. July 15-20.

Threlfall, R.T. and J.R. Morris. 2005. Yeast rehydration aid and nutrients t enhance initiation and completion of wine fermentation. Am. J. Enol. Vitic. 56(4):420A. Abstract.

Threlfall, R.T., G.L. Main and J.R. Morris. 2005. Laboratory handling of red grapes to estimate wine composition. Am. J. Enol. Vitic. 56(3):309A. Abstract.

Tran, K.H., N.S. Hettiarachchy, and S. Eswaranandam. 2005. Effect of malic acid incorporated carboxymethyl cellulose and soy protein isolate film coatings on the color of alfalfa and mung bean sprouts on storage at 4°C. IFT Annual Meeting and Food Expo, New Orleans, Louisiana. July 15-20.

Tran, K.H., N.S. Hettiarachchy, and S. Eswaranandam. 2005. Textural properties of malic acid incorporated carboxymethyl cellulose and soy protein isolate coatings on alfalfa and mung bean sprouts on storage at 4°C. IFT Annual Meeting and Food Expo, New Orleans, Louisiana. July 15-20.

Truitt, E.E., T.J. Siebenmorgen, and D. Schluterman. 2005. High temperature rough rice drying characteristics. Poster of the AACC Annual Meeting, Orlando, FL. Sept. 11-14.

Wang .Y-J., M-I. Kuo, N.A. Landerito. 2005. Effects of protein matrix on starch gelatinization in corn and rice grits, AACC annual meeting, Orlando, FL. (poster).

Wang Y-J. 2005. Physical and chemical properties of medium and long grain rices and their relevance to end-users. AACC Annual Meeting, Orlando, FL. (Oral presentation).

Wang, L., J. Patindol , Y-J. Wang. 2005. Increasing oligosaccharides content in rice bran by physical and enzymatic treatments, AACC annual meeting, Orlando, FL. (poster).

Wang, Y-J., M-I. Kuo, L. Wang, J. Patindol. 2005. Structure responsible for swelling and granule integrity of rice starch as revealed by surface chemical

gelatinization. AACC annual meeting, Orlando, FL. (poster).

Watson, N., T.J. Siebenmorgen, and P.A. Counce. 2005. Effects of nighttime temperature during grain filling on rice processing quality. Poster of the AACC Annual Meeting, Orlando, FL. Sept. 11-14.

Webber, D., N. Hettiarachchy, R. Horax, R. McNew, M. Jalaluddin, P. Chen. Extraction, optimization, characterization, and antioxidant capacity of phenolics from cowpea (*Vigna unguiculata*). The Sixth International Conference and Exhibition on Nutraceuticals and Functional Foods. Anaheim, San Francisco, CA. October 16–19.

Webber, D.M., N.S. Hettiarachchy, R. Horax. 2005. The effectiveness of various solvents in the extraction of phenolic acids from cowpea. IFT Annual Meeting and Food Expo, New Orleans, Louisiana. July 15-20.

Wood, D., G. Cagampang, A.L. Matsler, and T.J. Siebenmorgen. 2005. A method for determining lipid distribution in rice grain using fluorescence microscopy. Presentation at the AACC Annual Meeting, Orlando, FL. Sept. 11-14.

Xiong, R., J-F. Meullenet and C. M. Owens. 2005. Classification of tender and tough broiler breast meat by a non-destructive deformation test. IFT Annual Meeting Book of Abstract, New Orleans, LA.

Xiong, R., J-F. Meullenet, L.C. Cavitt and C. M. Owens. 2005. Effect of razor blade penetration depth on correlation of razor blade shear values and sensory texture of broiler major pectoralis muscles. IFT Annual Meeting Book of Abstract. New Orleans, LA.

Yucel, S., S. Turkey and A. Proctor. 2005. Triacylglycerol and oleic acid adsorption on magnesium silicate produced from rice hull ash. IFT Annual Meeting. New Orleans, LA. IFT Annual Meeting. New Orleans, LA. July 18th.

F. Presentations: (Regional, State and Local Meetings):

Bautista, R.C. and T.J. Siebenmorgen. 2005. Variability in rice properties. Poster Presentation at the Rice Research and Extension Center Field Day. Stuttgart, AR. August 9.

Eswaranandam, S., N. Hettiarachchy, M.G. Johnson. Development of lactoferrin and malic/lactic acid incorporated antimicrobial soy and whey protein film coatings for inhibiting *Salmonella Typhimurium*, *Listeria monocytogenes*, *Escherichia coli* O157:H7 and *Campylobacter jejuni* in raw and Ready-To-Eat chicken and turkey: Activation of lactoferrin by citric/lactic/malic acid alone and in combination with EDTA and the effect of activated lactoferrin on the antimicrobial activity against *Listeria monocytogenes* and *Escherichia coli* O157:H7. The Food Safety Consortium. Manhattan, Kansas. Oct. 2-4.

Hettiarachchy, N., T. Sivarooban, B. Adams, M.G. Johnson. Selected herbal and plant extracts and nisin incorporated edible films to inhibit growth of *Listeria monocytogenes* (V7 serotype 1/2a, 1/2c separately), *E. coli* O157:H7 and *Salmonella Typhimurium* (DT 104) on raw and cooked Ready-To-Eat poultry meat: Inhibitory activities of grape seed extract, nisin and EDTA incorporated soy protein edible films against *Listeria monocytogenes*, *E. coli* O157:H7 and *Salmonella Typhimurium*. The Food Safety Consortium. Manhattan, Kansas. Oct. 2-4.

Hettiarachchy, N.S. I. Phenolics, antioxidant, antimutagenic, and antimicrobial activities of bitter melon (*Momordia charantia* Linn.) extracts from

various solvents; II. Effectiveness of various solvents in the extraction of phenolic acids from cowpea. Department of Agriculture, School of Agriculture, Fisheries and Human Sciences, University of Arkansas at Pine Bluff. July 28.

Hettiarachchy, Navam S., R. Horax, and P. Chen. 2005. Nutraceutical and functional properties (including protein) of bitter melon and cow pea. Pine Bluff, Arkansas, August 3.

Hettiarachchy, Navam S., S. Eswarandandam, T. Sivarooban, B. Adams, M. Johnson. 2005. Effectiveness of plant extracts and lactoferrin in inhibiting major food-borne pathogens; Irradiation and poultry meat quality. Manhattan, Kansas City, October 3-4.

Hettiarachchy, Navam. 2005. Research and commercialization. Washington Carver and Summer Scholars. University of Arkansas, Fayetteville.

Hettiarachchy, N.S. 2005. Soybean by-product film and adhesive applications. For: Exon Science Inc. Guei Shan County, Taoyuan, Taiwan, R.O.C. Dept. of Food Science, University of Arkansas, Fayetteville, Arkansas, March 29.

Hettiarachchy, N.S. 2005. Value-added applications of films. For: Exon Science Inc. Guei Shan County, Taoyuan, Taiwan, R.O.C. Dept. of Food Science, University of Arkansas, Fayetteville, Arkansas. April 13.

Howard, L. 2005. A food chemists perspective on research and development in the food industry. University of Arkansas, Department of Food Science Seminar. Fayetteville, AR. March 28.

Lam, H.S., A. Proctor, J. Nyalala, M.D. Morris, and G.W. Smith. 2005. Fourier transform infrared spectroscopy evaluation of low density lipoproteins oxidation in the presence of Quercetin, Catechin, and alpha-Tocopherol. Arkansas Biosciences Institute Fall Research Symposium. October 28th.

Main, G.L. and J.R. Morris. 2005. Influence of macerating enzymes and grape seed tannin on color extraction and retention in Cynthiana wine. Presented at the American Society of Enology and Viticulture Eastern Section, 30th Annual Meeting, St. Louis, MO, July.

Morris, J.R. G.L. Main, and R. K. Striegler. 2005. Rootstock effects on Sunbelt productivity and fruit composition. Presented at the Rootstock Symposium. Osage Beach, MO. February.

Proctor, A., T.J. Siebenmorgen and R.L. Eason. 2005. Harvest conditions and kernel damage effects on milled rice free fatty acid quality. Rice Research and Promotion Board Report. Spring/Summer/Fall reports.

Rababah, T., N. Hettiarachchy, S. Eswaranandam, J.F. Meullenet. 2005. Maintenance of raw and cooked Ready-To-Eat product quality of infused poultry meats with selected plant extracts during electron beam irradiation and after storage: Sensory evaluation of irradiated and non-irradiated poultry breast meat infused with plant extracts. The Food Safety Consortium. Manhattan, Kansas. Oct. 2-4.

Siebenmorgen, T.J. 2005. Recent advances in rice processing. Presentation to the Annual Arkansas Section of Agricultural and Biological Engineers. Little Rock, AR. October 7.

Striegler, R.K., J.R. Morris, G.L. Main, and C.B. Lake. 2005. Effect of rootstock on fruit composition, yield, growth, and vine nutritional status of

Cabernet franc. Rootstock effects on Sunbelt productivity and fruit composition. Presented at the Rootstock Symposium. Osage Beach, MO. February.

Watson, N. and T.J. Siebenmorgen. 2005. Historical analysis of the effects of nighttime air temperatures on rice quality. Poster Presentation at the Rice Research and Extension Center Field Day, August 9. Stuttgart, AR.

G. Other Creative Endeavors:

Meullenet, J.F. Attended workshop on probabilistic unfolding: Multivariate mapping, drivers of liking and product portfolio optimization. The Institute for Perception, The Cloister, Sea Island, Georgia, February 23-25.

Morris, J. Acted as adviser to Wiederkehr Wine Cellars, Altus, AR; Mount Bethel Wine Cellars, Altus, AR; Post Familie Winery, Altus, AR; Chateau Aux Arc Vineyards and Winery, Altus, AR.; Cowie Wine Cellars, Paris, AR; and several wineries and vineyards throughout the United States.

Morris, J. Acted as judge for 'Wines of the South' Regional Wine Competition at Knoxville TN, in October.

Morris, J. Acted as judge for the Arkansas State Fair Wine Competition in Little Rock.

Morris, J. Advised colleagues from other Universities on viticulture and enology research issues.

Morris, J. Conducted a seminar for French Camp and Gallo managers on: Vineyard Mechanization. Santa Margarita, CA.

Morris, J. Evaluated harvesting operations in four Central Coast California vineyards

Morris, J. Member Steering Committee of National Grape & Wine Initiative – an initiative to promote sustained agricultural growth throughout the country. They support the effective communication of research results to growers, wineries, and processors through enhanced extension and education efforts. Attended an ARS – Grape/Wine Industry Workshop in St. Louis in July as part of duties on this committee.

Morris, J. Met with OXBO in January and in October for meetings concerning the vineyard mechanization patent implementation.

Morris, J. Organized and implemented matching grants between industry and scientists through the Institute of Food Science and Engineering.

Siebenmorgen, T. Attended meeting to discuss issues in rice drying and storage with Riceland Foods. Little Rock, AR. February 23.

Wang, Y. Worked with Brewing Research and Technology of Anheuser-Busch, Inc., and secured continuing financial support for next year.

Bumper's College of Agricultural, Food and Life Sciences

Publications & Other Research Activities 2005

	AEAB	AEED	ANSC	BAEG	CSES	ENTO	FDSC	HESC	HORT	PLPA	POSC	Total
Books							0					0
Book Chapters							4					0
Refereed Articles							43					0
Un-Refereed Publications & Proceedings							27					0
Invited Lectures							22					0
Other Lectures, Papers & Oral Presentations							57					0
Other Creative Endeavors							20					0
Total	0	0	0	0	0	0	0	0	0	0	0	0

VII. State of the Department

Through the dedication of highly competent and hard-working faculty and support personnel, the Department of Food Science is highly productive as demonstrated from research contributions, grants secured, educational programs and service activities. Through the addition of two faculty members in 2005 with expertise in food safety and food processing and packaging and the addition of new expanded facilities Department of Food Science has a strong foundation for future growth, development and further advancement of Food Science teaching, research and service programs. In view of the importance of food and food related industries to Arkansas, there are many employment opportunities for Food Science graduates and many research and service opportunities to assist with further development.

The Department of Food Science at the University of Arkansas meets the educational standards required by the national committee on higher education of the Institute of Food Technologists. Programs accomplishing the national educational requirements are considered to be equal in stature and no ranking has been attempted. In contrast, programs that do not meet the national education requirements are not nationally recognized.

Department of Food Science

In terms of graduate students, students completing degree requirements, grant support, publications and presentations based on faculty FTE, the Department of Food Science would be expected to have a superior ranking. The quality of Food Science students and research contributions are nationally competitive as demonstrated from awards and scholarships earned.

Typical of other Food Science programs in the USA, student enrollment has declined; however, this trend has been reversed at the UA, which is attributed to enhanced resources, professional student advising and recruiting, and emphasis on academic program quality. Student enrollment in Food Science at the UA during 2005 was maintained at the high number achieved the previous year, which was substantially higher than it ever has been. Continued growth in enrollment is expected to occur through the recruiting efforts of the university, college and department. With increased student enrollment more scholarships designated for Food Science students are critically needed.

With additional faculty appointments and new programs offered, Food Science at the UA has the potential to become one of the most highly recognized programs in the USA. While current programs and individual faculty are nationally recognized, more areas associated within the discipline of Food Science along with strengthening of certain program areas will allow the department to elevate stature appropriate for the UA.