COMMENTS FROM THE DEPARTMENT HEAD

As we look to the future, many questions are being raised about food science. What kind of learning experiences (education) should students have to prepare them for productive lives as citizens and food scientists/technologists? How many food scientists with A.A., B.S., M.S., and Ph.D. degrees are needed during the next ten years? Should all undergraduates in food science/technology have an internship in industry before graduation? What core subject matter should be included in all food science degree programs?

The Education Committee of the Institute of Food Technologists is reviewing the minimum standards for a B.S. degree in food science. A forum was held at the recent IFT meeting in Anaheim. Several speakers briefly addressed what they perceived as needs of food science graduates in small and medium industries, large corporations, graduate schools and government. An interesting discussion followed involving participants from the audience. Many different viewpoints and recommendations were presented. The complexity of the issue was vividly illustrated. The Education Committee is expected to have a report and recommendations within the next year.

Several vice presidents and directors of research and development at major food companies of the U.S. belong to an informal Research Directors Round Table. This group has become concerned with the relatively small number of food science graduates they are hiring for research and development positions. They have discussed the issue, visited with several heads of food science departments, and have retained a consulting firm to conduct a study of food science departments at selected universities. Emphasis will be on the degree programs and the nature of the students in those programs when compared with departments such as biochemistry, chemistry, microbiology, and engineering. Representatives from admissions and placement officers in the university will also be interviewed. A report is expected in the fall. Our department is one of those included in the study.

At a one-day retreat this spring, departmental faculty addressed a number of the above issues relative to our teaching, research and extension programs. It was not a time for conclusions, but rather for raising and initiating discussion of subjects important to the future of the department and its programs. This was done in the context of reviewing and revising departmental objectives for the next five years. With a budget shortfall in the state and the probability of further restriction of available resources, it was an opportune time for such a review. Several areas for continued focus became readily apparent. These included:

1. An emphasis on student quality at the undergraduate and graduate levels, with particular attention to increasing the enrollment in the four-year B.S. degree program and the two-year A.A. degree program.
2. Increased attention to the relationships with industry. This includes strengthening current working relationships, forming new ones, and seeking ways to ensure that such linkages are mutually beneficial.
3. Improved utilization of space and facilities in Schaub Hall, with the acquisition of research and teaching instrumentation/equipment representing a critical need.
4. Increased emphasis upon curriculum, learning experiences, and the creation of a climate in which excellence in teaching is expected and rewarded.
5. Increased attention to the relationship between the department, the Center for Aseptic Processing and Packaging Studies (CAPPS), and the Southeast Dairy Foods Research Center (SDFRC). The creation of CAPPS and SDFRC have strengthened the overall food science program at NCSU. Closer cooperation and integration should further enhance the program.

These represent our challenges and goals. Strategies must be developed if they are to be realized. — David R. Lineback

Educational Opportunities for Area Food Scientists

Food Science courses offered in afternoon and evening time slots will accommodate potential students employed in local food industries. Food Microbiology (FS MB 405) will be taught from 3:40 to 5:30 Wednesdays with lab from 3:40 to 6:35 Mondays by Dr. P.M. Pogosbog, Dr. K.R. Swartzel will teach Food Kinetics (FS 580) Tuesday, 6:00 to 9:00 p.m. Contact the instructors or the department (737-2952) for more information. We would like to add more Raleigh area food industry employees to our list of alumni.
CAPPES Welcomes New Member

Ross Laboratories became the newest industrial member of the Center for Aseptic Processing and Packaging Studies (CAPPES), effective April 1, bringing the membership to nine.

Based in Columbus, Ohio, Ross is a division of Abbott Laboratories. Ross Laboratories has been committed to the field of nutrition for 85 years and is a worldwide leader in the competitive health care industry.

"An important dimension is added to the CAPPES program by the Ross Laboratory membership," said Director Kenneth R. Swartzel. "Industries emphasizing health and care-giving supplies have needs and concerns related to the use and development of aseptic technology not unlike traditional food processing industries," Swartzel added.

NCUS Hosts ADSA

The American Dairy Science Association held its 85th Annual meeting on the NCUS campus June 24-27, 1990. Many of the Food Science and Animal Science faculty served on planning committees to attend to the numerous arrangements needed to host over 1700 scientists and guests who attended the meeting. Over 150 papers were presented in 16 sessions in the Dairy Foods Division, keeping graduate student-projectionists busy. The Dairy Plant in Schaub Hall was open for tours, and many participants took advantage of this opportunity to visit our facility. Numerous complementary remarks were received about the overall organization of the meeting and the excellent facilities available in the McKimmon Center; the ADSA Board of Directors ended their closing meeting with a round of applause and a thank you to all who helped to organize and carry on such a successful meeting.

Dairy Center Highlights Research Technologies to International Audience

The Southeast Dairy Foods Research Center (SDFRC) sponsored a one-day pre-meeting workshop prior to the ADSA Annual Meeting in Raleigh on June 23, 1990. "Designing New Dairy Foods: Applications for Biological Technologies in the Dairy Food Industry" attracted 20 participants from university, government and industrial research centers across the U.S. and Canada, and as far away as Switzerland, Finland and New Zealand. The morning session featured welcoming remarks by organizer and moderator Dr. John Rushing, followed by explanations of "Genetic Technologies" by Dr. Todd Klaenhammer, "Supercritical Fluids Extraction" by Tina Lorenzo and Hao Chen, "Food Gels Rheological Tools" by Dr. Allen Foegeding, and "Continuous Bioreactors" by Dr. Harold Swaisgood. The afternoon session consisted of a series of laboratory demonstrations and discussions of these important technologies in use at the SDFRC at NCUS.

Hao Chen demonstrated the supercritical fluid extraction apparatus in use in Dr. Steve Schwartz’s laboratory and explained how it can be used to separate various lipid fractions from milk fats, possibly leading to the production of foods with improved nutritional and functional properties. Sara Morrison-Rowe and Randy Koch assisted Dr. Foegeding with the demonstration of cutting and milling various types of cheese to a standard dumbbell shape for testing rheological properties with a Brookfield viscometer. The group observed a data collection from the Bolin rheometer as Dr. Foegeding explained the relationships between the rheological data and the textural properties of the cheeses.

Dr. Klaenhammer’s talk emphasized the importance of genetic technologies in the dairy industry and explained the design and function of cloning, expression and integration vectors for transmitting genes to the microorganisms involved in the fermentation of dairy foods. He pointed out an FDA ruling that gives GRAS status to chymosin produced in E. Coli via recombinant DNA techniques, which shows that the FDA recognizes that the product, not the production technology, is the item of concern for consumer protection. The audience split up into smaller groups for the demonstration of genetic techniques by students and staff in Dr. Klaenhammer’s lab. Linda Harris and Raul Raya demonstrated membrane transfer and DNA integration procedures; Lynette Miller and Gwen D’Amello showed techniques involved in DNA analysis and sequencing, while Evelyn Durmaz and Kathy Milton put on a shocking display of electroporation techniques developed in the lab for introducing foreign DNA into bacterial cells.

To conclude the afternoon session, Dr. Swaisgood immobilized the audience with a discussion of how continuous bioreactors can be used to enzymatically treat milk or other fluids without introducing the enzymes to the final product. The two bioreactors that were demonstrated have enzymes attached to a solid support to interact with the fluids that are pumped past them. Participants felt the demonstrations were a particularly good idea, and left with an understanding of how designs for new dairy foods can be helped by the technologies being investigated at SDFRC.

Faculty Searches in Progress

A series of interviews is in progress to select new extension faculty members in the areas of poultry products and fruit and vegetable processing to fill the positions created by the retirement of Drs. Fred Tarver and Frank Thomas. Although we are actively recruiting several hot candidates, the process has been slowed by a freeze on hiring for all university positions due to the state budget shortfall. We hope this situation will thaw by the time the best candidates for the positions have been selected and that our ability to hire top quality individuals will not be impaired.
Red Meat Extension in the 1990's

Dr. Dwain Pilkinson is an Associate Professor and Extension Specialist in the Food Science Department. His primary responsibility is the red meat processing industry. In this context, he has a strong applied research and extension education program devoted to the needs of this industry. The following provides some insight into the direction of this extension program and highlights current projects.

The Red Meat Extension program has been changing to better serve clients within the State of North Carolina. These changes are in line with the demographic changes within the state and objectives of the Extension Service. Our overall objective is to help the red meat industry meet the desires of today's consumer.

The major programmatic thrust is to bring new science-based meat technology to the attention of the industry. In addition, we must be aware of changes in the consumer attitude about red meat and what they desire in table-ready meat products. This requires that we use both on-campus and off-campus resources and conduct applied research to determine how fundamental research findings may benefit the industry. The following will explain, in capsule form, how the Red Meat Extension Program ranges from the live animal to meeting the needs of today's nutrition-conscious consumer.

The final quality of fresh and processed meat products is related to the beginning raw material. North Carolina now has the largest swine producing county in the United States. With increased concentration in live animal production and a decrease in the number of meat slaughtering and processing plants, there is a need for optimum quality in fresh meat to meet the rigors of longer distribution cycles. Some processors have become concerned with the firmness of fresh pork and have encountered shortages of normal fresh color stability of pork products in the retail counter. In response to these needs, we recently received funding from the North Carolina Pork Producers' Association to conduct a study for improving the desirability of fresh pork at the retail level. This is a joint program with the Department of Animal Science, Swine Nutrition.

Many consumers are concerned about the sodium (salt) content of processed meat products. We have been involved in sodium reduction projects over the last several years. One approach has been to reduce the salt content with potassium chloride. With North Carolina being the largest country ham producing state, the industry raised the question of how to achieve sodium reduction when the Food Safety and Inspection Service, United States Department of Agriculture (USDA/FSIS) regulations require 4.0% salt in the finished product. Further, no research had been conducted showing that Trichina would be devitalized when potassium was used in place of sodium. Funds were received from Agricultural Foundation, industry and a commodity organization for such a study. Results of this joint research project conducted with the Food Science Microbiology group showed there was no difference in Trichina kill when potassium chloride was used as a partial replacement for sodium chloride. We are finalizing results of processing studies in order for the USDA/FSIS to publish a federal regulation permitting the use of potassium chloride as an ingredient in country hams.

Another industrial, consumer and National Extension concern has been listeriosis associated with processed meat products. We organized and held a workshop on the meat processing industry of the USDA/FSIS Hazard Analysis Critical Control program in this area and measures the plants need to follow to prevent listeria on meat products. Further, we have a research study underway of red meat cultures that produce a protein that will inhibit the growth of Listeria monocytogenes — the microorganism that causes listeriosis. This study is currently underway with cooperation of the Food Science Microbiology research group. It is being financed by the National Live Stock & Meat Board from "Check-Off Dollars". Findings from this study should lead to a practical method for preventing outbreaks of listeriosis.

Applying these research findings to everyday meat processing practices is the objective of the red meat extension program. Traditionally extension has conducted in plant programs. Although we still utilize this approach, we are expanding the workshop concept to economically and effectively reach more processors. This technique has been utilized for the sodium reduction program and in being used to familiarize some of the processors with the use of new "tumbling" techniques for developing new processing procedures.

Our consumer education program varies from individual telephone contacts to formal presentations before different organizations such as with livestock groups at their county and annual meetings. Also, we participate in radio and television programs. A recent concern has been over the "decreased consumption" of red meat, specifically beef. Actually, the mathematical decrease in per capita consumption has been the result of the USDA using a different statistical constant to more accurately reflect the marketing of fat-trimmed, boneless cuts of beef desired by the consumer. Therefore, the emphasis of this education program has been to show that there really has not been a decrease in beef consumption. Instead, the consumer is demanding and buying boneless beef with less fat.

Food Science Red Meat Extension is committed to helping the red meat processing industry in North Carolina meet the needs of our 1990's consumer. In order to achieve this goal, it is involved in implementation of research-based technology, from producing live animals to the consumer-ready products.

— Donn R. Ward and Dwain H. Pilkinson
FOOD SCIENCE CLUB

Food Science Club Awards Banquet

The 24th Annual Food Science Club Banquet was held March 29 at Ballantines Restaurant. Ginger Goodman (Salisbury) received the B.M. Newell Outstanding Senior Award and the Forbes Leadership Award. The Ambrosia Chocolate Award (engraved watch) went to Jaime Mullerat (Spain) for the highest overall grade point average of seniors. Lisa Shaw (Galthersburg, MD) was presented the Croucher Scholastic Achievement Award for the highest average of juniors. Outstanding Club Member plaques were presented to Jaime Mullerat, undergraduate, and Marie Walsh (Brantree, MA), graduate student.

Food Science Club Officers elected for 1990-91: President—Julie Northcutt (Ph.D., Greer, SC) Vice President—Sharon Ramsey Bottcher (MS, Raleigh) Secretary—Sandy Metko (MS, Raleigh) Treasurer—Lettitia Strowbridge (Sr. Goldsboro) Publicity Historian—Andrew Butler (MS, Gahanna, OH)

Activities Co-Chairs—Alfredo Maruri (Jr., Raleigh) Bruce Heim (Jr. Winston-Salem) Leola Henry (MS, Springfield, AI) Agri-Life Council Representatives—Lettitia Strowbridge David Guisbert (So., Clemons) Keith Petrofsky (Sr., Creve Coeur, MO) Advisers—Dr. Jonathan Allen & Dr. Don Ward Major Club projects this year included the Dairy Bar at the State Fair, planning a Carolena-Virginia IFT Meeting, the 5th Annual Food Science Symposium, and the 24th Annual Awards Banquet.

Student Research Symposium Held

One highlight of the Food Science Club activities this year was the Fifth Annual Food Science Student Symposium, held at the Brownstone Hotel on March 16. Over 60 people attended the session in which twelve students from all food science disciplines presented 15-minute talks on their research projects. The symposium provides attendees with the opportunity to learn about research being conducted in various labs within the department. Speakers benefit from having a friendly audience on which to test a presentation before having to speak at a national meeting. The evening was followed by a catered reception.

A few selected examples of presentations: Fatima L. Canjura's talk, "Determination of Chlorophylls and their Derivatives by High Performance Liquid Chromatography", described a method she has developed in Dr. Schwartz's lab to derivitize the chlorophyll pigments from spinach leaves, separate the compounds using HPLC and identify them by their absorption spectra and mass spectrometry. Jianqin Wu, a student in Dr. Hamann's group, gave a detailed account of the kinetic theory that related to protein gelation in his talk, "Myosin Gelation Kinetic Study Based on Rheological Measurements". Joanna Massey, an undergraduate working with Colin Hill in Dr. Klaenhammer's group, presented "A Rapid Method to Identify Lactococcal Bacteriophages by Restriction Analysis". This test allows a host bacteria to replicate the phage, and the harvested phage DNA is cut into identifiable segments which the authors visualize on agarose gels. They have investigated the relatedness of phage which were isolated from different cheese plants at various times. Nutrition research in the department was represented by Lisa Haedrich, a student in the Nutrition Program working with Dr. Allen. Her talk, "Hydrocortisone Stimulation of Zinc Transport Rates in COMMA-1D Mammary Cells", described some of her studies on the hormonal regulation of cellular zinc metabolism using a cell culture system. Other presentations were made by Mark Beaumont, Marie Walsh, Sharon Chen, Jennifer Maruri, Debra Daum, Joseph George, Jean Marie Michaelis and Tim Fairchild. Jean Marie Michaelis and her committee put together a balanced and enjoyable program.

Honored at IFT

The NCSU Food Science Club received a ranking of third best in the nation at the Institute of Food Technologists meeting in Anaheim, California, in June. Food Science Clubs from different Universities compete on criteria such as membership, participation, and number and quality of educational and service activities. The club scored especially high in the areas of programs at meetings, social and outside activities and fundraising. Officers for the coming year are planning to do even better next year.

SCHOLARSHIPS/FELLOWSHIPS

Six students in Food Science have won scholarships or fellowships in national competition for 1990-91. The Institute of Food Technologists (IFT) awarded undergraduate scholarships to Keith Petrofsky, Carol Tompkins (So, Springfield, VA), Christy Wilson (So, Clinton) and Hillary Hunt (Fr, Clinton). Carol Tompkins is also the recipient of an RJR Nabisco Scholarship and a Carolina-Virginia IFT Scholarship. Ginger Goodman (Sr, Salisbury), was awarded a National Dairy Promotion and Research Board Scholarship. IFT Graduate Fellowships were awarded to Janelle Howe (MS, Lincoln, NB) and Polly Dinsmore (MS, Richardson, TX). Anne Tieleman (B.S., 1986) also received an IFT Fellowship. She is pursuing her graduate work at the University of Minnesota.

Recipients of scholarships awarded by the department will appear in the next newsletter. The last two or three years scholarships have been awarded every Food Science major with a grade point average of 3.0 or higher. This fall we expect 21 continuing B.S. candidates with...
Scholarships (continued from page 4)

GPA’s above 3.0. In addition there will be a number of entering freshmen, transfer students, and associate degree students who are good scholarship candidates. Our success in recruiting outstanding students is helped by scholarships. If the recruitment success continues, it is tuition as expected, Food Science scholarship funds will fall far short of covering the tuition and fees of worthy students. Last year tuition and fees amounted to $1150 for most students. — V. A. Jones

Food Science Graduates

Diplomas were presented to 15 graduates in Food Science at May Commencement. B.S. degrees were earned by Renee Alexander (North Wilkesboro), Suzanne Halthcock (Cary), Stanely Leslie (Cary), Judy Lewis (Raleigh), Marco Muelink (Holland), and Lisa Wilson (Durham). Master of Science degrees were awarded to Patricia Butcher (South Africa), Fatima Canjura (Fullbright Scholar, Guatemala), and Sayyaparaju Raju (India). Melissa Joerger (Newberg, OR) and Ganesh Kamath (India) received Ph.D. diplomas. Associate degrees in Food Processing, Distribution and Service were awarded to Martha Alexander (Raleigh), John Boyette (Hurdle Mills), Jonathan Morgan (Rockwell), and Fred Richman, Jr. (Siler City).

Phi Tau Sigma and Food Science Department Sponsor

Fourth John L. Etchells Memorial Lectures

The North Carolina Chapter of the Phi Tau Sigma Honorary Society held April 2-3 with a reception, business meeting, installation of new members and officers, and presentation of lectures by Dr. Clifford W. Hesseltine, former Chief of the Fermentation Laboratory, U.S. Department of Agriculture, Northern Regional Research Center, Peoria, Illinois. Hesseltine, whose USDA research on mycotoxins, cereal microbiology, fermentations involving fungi, Oriental and African fermented foods, and methods for and maintenance of microbial culture collections has gained international prominence, spoke on "Peoria, An International Center of Fermentation Excellence" during the Monday afternoon meeting and lectured the next morning on "An Overview of Oriental Fermented Foods." The Etchells Lecture Series has been held biennially since 1984 in memory of Dr. John L. Etchells (1909-1981) who, for 38 years as bacteriologist and leader with the United States Food Fermentation Laboratory at NCSU, and professor in the Departments of Food Science and Microbiology, was a charter member of the Phi Tau Sigma. This year's lecture successfully introduced some culture to the food science seminar series.

The 1989-90 Phi Tau Sigma Officers are: Lynn Turner, President; James Kelly, President-Elect; Duane Larick, Secretary; Neil Webb, Councilor; and Brian Sheldon, Alternate Councilor. Roy E. Carawan is outgoing President. The new members inducted were Dr. Donald D. Hamann, Dr. Tyre C. Lanier, Dr. Jonathan Allen, and Dr. Linda R. McDonald. New Associate Members are undergraduate students Jaime Mullerat and Ginger Goodman and graduate students Mark D. Baumont, Sharon Botcher, Fatima Canjura, Sharon Chen, Debra L. Daum, Evelyn Durmaz, Leola Henry, Erik W. Karas, Tina Lorenzo, Jennifer Maruri, Jean Marie Michaels, Raul Nunes, Dennis Romero, Walter W. Stewart, Marie K. Walsh, Laura Schrum, and K. Mark Wieneck.

Food Science Journal Club Initiated

The start of the spring semester signaled the beginning of the new Food Science Journal Club, a monthly series of noon-time, informal lecture/discussions of issues and topics of interest to those in food science. The first meeting was on "The Dietary Fiber Controversy", presented by the USDA National Needs Fellows who composed the organizing committee for the series. Faculty who presented the next three sessions and their topics were: Jonathan Allen, "Vitamins, Growth Factors and Essential Nutrients; or What do Consumers Really Need to Know About Nutrition?"; Todd Klaenhammer and Tom Hoban, "Biotecnology and Social Issues"; and Duane Larick, "Dietary Fatty Acids and Lipid Oxidation Products: Effect on Coronary Heart Disease". The format, consisting of a presentation by the speaker, followed by a lively discussion of the issues surrounding the topic, added a new dimension to interactions within the department.

Maria Walton Retires

Maria Walton, a secretary at NCSU for over 26 years, retired in February. Ms. Walton began work in the Extension Division of Food Science several years prior to the move from Polk Hall to the "new" Schaub Hall. Later, she became secretary for faculty in the food chemistry section on the second floor. She was instrumental in moving departmental paperwork into the computer age, and was involved in the training and orientation of many of our current office staff. Last year she was nominated for the NCSU Outstanding Employee Award. Her retirement and service was recognized with a reception in the department and a retirement dinner at Meredith College's Belk Dining Hall. Due to the state hiring freeze, her position is still vacant, and she is missed. However we know all along that her personal attributes and level of service were not replaceable.
FACULTY ACTIVITIES

Jonathan Allen was elected to membership in the American Institute of Nutrition at their annual meeting in Washington, DC, in April, where he presented/co-authored two papers reporting on a comprehensive, longitudinal study of human milk composition. Dr. Allen received a grant from the Institute of Nutrition, UNC-Chapel Hill for studies on "Molecular and Cellular Mechanisms for Zinc Entry into and Availability from Milk". In May, he participated in the first C.A.L.S. Teaching Effectiveness Workshop on "Developing an Effective Teaching Style."

Herschell Ball presented lectures on new developments in egg product technology to the California Egg Marketing Association at their meetings in Riverside and Modesto, CA and a seminar on egg research for faculty and students at the University of California, Davis, last January. March 1 he discussed factors impacting on the development of new egg products at the Midwest Poultry Federation meeting in Minneapolis. Drs. Ball and Humann served as mentors for two North Carolina School of Science and Mathematics seniors, Hillery Hunt from Clinton, NC, and Loraine Lanningham from Mount Airy. The mentorship program allows seniors at NCSS&M to explore areas of interest beyond its campus. Ms. Hunt will be a freshman in the department next fall. She has been awarded a national IFT Freshman Scholarship.

George L. Catignani presented a paper entitled "Determination of beta-carotene and its predominant cis-isomers in human serum" at the April Meeting of the Federation of American Societies for Experimental Biology in Washington, D.C. Catignani and S.J. Schwartz received a grant from the Institute of Nutrition, UNC-Chapel Hill to study methods of carotene analysis. Schwartz and Catignani were also awarded a USDA Competitive Grant in Human Nutrition titled "Assay of Cis-Carotene Isomers in Human Plasma" that will further study carotene metabolism.

Dr. Henry Fleming visited Seville, Spain, area May 21-26, 1990, by invitation of the Instituto de la Grasa y sus Derivados. While there, he gave two presentations dealing with cucumber and sauerkraut fermentations, visited olive oil making companies, visited a manufacturer of olive fermenters, and discussed research on vegetable fermentations of mutual interest with scientists of the Instituto. He also got to see some of the city of Seville (site of EXPO '92) and the countryside. He returned with new impressions of Spain, particularly the olive industry, and slides and words for anyone who dares to ask.

E. Allen Foegeding received a grant from the National Dairy Promotion and Research Board entitled "Deterioration protein gelation mechanisms which can be used to create new and unique textures with milk proteins". Funding for two years is $78,994.

Peggy Foegeding presented invited seminars at University of Tennessee Department of Food Science and Technology on March 5, University of Georgia Department of Food Science on April 28, and at the ADSA meeting in Raleigh on June 26, 1990.

Dr. M.E. Gregory was appointed to N.C. Environmental Health "State of Practice" committee, which is responsible for Environmental Health Specialist training. He recently completed four years of participation as a member of the N.C. Restaurant Rules Revision Committee. The new regulations will go into effect in 1992. Dr. Gregory was appointed an Associate Member of the Graduate Faculty.

Arthur Hansen was honored with the Kraft Inc. Teaching Award for outstanding teaching and training of Dairy students for the dairy industry. He received a grant for #6956 from FMC to study functional properties and sensory qualities of cellulose gel in low-fat and fat-free frozen dairy products, CAPPS funded a project on the effect of UHT processing, packaging, material ingredients, flavorants, oxygen and storage on the flavor stability of UHT products. Dr. Hansen and his research group presented five papers at the 85th annual ADSA meeting in Raleigh, and one paper at IFT in Anaheim, CA.

Todd R. Klaenhammer received the 1990 Dairy Research Foundation Award in recognition of his outstanding research contributing to the solution of significant dairy industry problems at the 85th Annual Meeting of the ADSA in Raleigh. Dr. Klaenhammer also recently received an Outstanding Alumni Research Award for work that represents the first successful application of "food grade" genetic engineering for improvement of microorganisms used in dairy fermentation.

N. Arlene Klapes presented a paper entitled "Application of ozone as a surface decontaminant/sterilant" at the 90th Annual Meeting of American Society for Microbiology in Anaheim, CA on May 13-17. A new $10,000 grant was funded by American Sterilizer Company (AMSCO) titled "Application of vapor phase hydrogen peroxide as an egg shell decontaminant" with Brian Sheldon as co-investigator. Ongoing collaborative research between Klapes and Sheldon on use of naturally-occurring antimicrobial peptides to control foodborne pathogens and spoilage microorganisms in poultry products will be supported with an award of $4,000 from the Biomedical Research Support Grant. Dr. Klapes was inducted into Sigma Xi Scientific Research Society on April 18, 1990.

Duane K. Larick, recently promoted to Associate Professor of Food Science, had a new project titled "Aseptic Processing of Comminuted Meat Products: Affects on Texture and Flavor" funded by the National Live Stock and Meat Board.

David R. Lineback chaired a session on "Strategic Approaches Strategies for Survival" at Food Update '90 (Naples FL, April 22-25). He had been Chairman of the Board of Governors of Food Update for the previous year. Lineback co-chaired a joint ECOP-ESCP ad hoc committee to develop two publications on "Food Safety" and "Nutrition and Health" for informing members of congress and their staff of current research and extension programs and needed
future efforts in these areas. At the Flour Milling and Baking Research Association in the UK, June 4-5, he directed and taught in a short course on "Starch: Structure, Properties and Uses in Food Systems," jointly sponsored by AACC and FMBRA. Lineback gave an invited presentation in a forum on "A Discussion of the Undergraduate Food Science Minimum Curriculum Standards" at the IFT meeting in Anaheim. He attended the 53rd Congress of the International Association of Cereal Chemistry, the pre congress symposium on "Oats in Human Nutrition" and "Bread, Ancient Food for Modern Times," and the joint ICA/AACC symposium on "Bacterial and Viral Contamination of Cereal Components and Their Implications for the Future" in Vienna, Austria, May 28-31. [Dr. Lineback also negotiated a new roof for Schaub Hall, a creditable achievement in our current fiscal climate. This will help to keep the new Interior paint job from washing away.—Ed.]

Steven J. Schwartz was awarded the Sigma Xi 1990 Outstanding Young Investigator Research Award. Two grants were received for collaboration with G. L. Catignani and another award came from CAPPS on "Reaction Chemistry of HTST Particulate Processing Under Aseptic Conditions", $36,980 for 1 year. Dr. Schwartz attended the 9th International Symposium on Carotenoids, May 20-25 in Kyoto, Japan where he chaired a technical session and presented a paper.

John Rushing organized and moderated the ADSA workshop "Designing New Dairy Foods" and gave a talk "Who's Minding the Store? Regulatory Agencies Involved in Food Safety" at the Eloise S. Cofe Family Living Seminar on "Food Safety: Today's Headlines". A grant entitled "Method for Sanitizing and Improving the Hatchability of Hatchery Eggs" was granted to Brian Sheldon and Dr. John Brake of the NCSU Department of Poultry Science. Dr. Sheldon received grants from Degussa Corporation on "Efficacy of H2O2 disinfection in Poultry Hatcheries. Phase II" and from AMS/CO and the BRSG with Dr. N.A. Klapes. A North Carolina Agricultural Foundation Assistantship was awarded to Drs. Sheldon and Klapes on "Potential Applications of Bacteriocins in Controlling Poultry Pathogens." CAPPS awarded 817,195 to Dr. Paul Dawson and Dr. Sheldon for a project on "Effect of Preheating Treatment and Sinking on the Particulate Texture and Integrity of Aseptically Processed Chicken." Dr. Sheldon was elected as an Alternate Counselor to Phi Tau Sigma. He presented a poster at the American Society for Microbiology Annual Meeting in Anaheim, CA on "Application of Oxygen Surface Decontaminant Sterilant."

William M. Walter Jr. will present an invited paper to the International Conference on Starch and Other Carbohydrates in Kagoshima, Japan, August 1990. He will serve as president of the National Sweet Potato Collaborator Group for 1990.

Clyde Young presented a training session on peanut flavor at the Peanut Business Marketing Seminar in January. He was invited to present a review paper on the structure of peanut seed.

### Student, Alumni and Staff News

Joseph A. George was named a recipient of the Sixth Annual Alumni Association International Graduate Fellowship this May. Jean Marie Michaels presented a paper at the Southern Poultry Science Association Meetings held last January in Atlanta and one at the IFT meeting in Anaheim entitled "Contribution of ovalbumin, conalbumin and lysozyme to the gelation of egg white." Graduate students Molly Warren, Jean Marie Michaels, and Hershell Ball, Brian L. Daniel joined Promega at a booth at the Southeastern Poultry and Egg Association's International Trade Show held in Atlanta January 31-February 2. The display presented information about poultry research being done in the department and information about departmental educational programs. Karen Motsinger Young finished her M.S. in Microbiology (directed by P.M. Foege funding) in June and is employed as a research technician in Cancer research at Duke. K. Mark Wienczek completed his M.S. in Microbiology (directed by P.M. Foege and N.A. Klapes) and related CAPPS research. Mark has begun a Ph.D. at the University of Maryland. Dr. Jungho Kim, a Research Associate in Dr. Peggy Foege's lab for the past 2 years returned to Korea in July for an academic position there.

Personnel turnover has been reported in Dr. Kienhammer's lab. Post-doc Colin Hill returned to Ireland on July 1 to take a position at the Moorepark Research Institute. Pete Murriana is now an Assistant Professor at Purdue University. Dennis Romley joined Promega in Madison, WI, as a fermentation/molecular biology specialist on July 1. Best wishes to these scientists on their new careers.

Susan Sumner (B.S., 1982) followed her NCSU food science education with M.S. and Ph.D. degrees from the University of Wisconsin. After spending a couple of years as Assistant Manager of the Microbiology Division, National Food Processors Association in Washington, DC, she started as an Assistant Professor in the Department of Food Science and Technology at the University of Nebraska on February 1, 1990.

Her position is 70% Extension and 30% Food Microbiology research. She has been happily married to another NCSU graduate for 9 years and is expecting her first child in late July.

The IFT Graduate Student Paper Competition normally selects one finalist from each of five regions of the country and covers travel expenses to present their papers at the National Meeting. This year, tradition was broken as Debbie Daum and Tricia Butler, both working in Dr. Allen Foege's lab, were selected as finalists and presented their papers in Anaheim, CA. Tricia's presentation was awarded second place winner. By coincidence (?), both contestants were also married in May. Debbie's new name is Debra Daum Thunberg, and Tricia answers to Patricia Ruth Kuhn. Tricia received her M.S. Degree in May and presented a poster at the ADSA meeting in June.