FROM THE EDITOR'S DESK

We have all heard of some of the problems facing agricultural and food science education, research and extension in the future:

- A low public understanding of modern agriculture, science and technology;
- The need for a high quality, economical food supply produced with reduced impacts on air, land and water quality; and increased concern for animal welfare;
- A reduction in the number of high school graduates and size of the college applicant pool;
- Decrease in the support base and funding for agriculture, research and extension on the federal and state levels.

The Department of Food Science faculty discussed these and other concerns with Dr. Tom Monaco, head of Horticultural Science, at a recent faculty retreat. After this and several other prepared presentations, they began the task of defining the mission, visions and goals for the department’s future. The one and a half day retreat led to the formulation of many ideas. Faculty committees were formed to further define and condense these ideas into the following body of statements that were adopted by the faculty at a meeting on July 9:

Mission of The Department of Food Science:

To help the people of North Carolina realize an improved quality of life by providing excellence in programs of research and education in food science and technology.

Vision Statements:

We strive to have the people we serve make the following statements about The Department of Food Science at North Carolina State University:

1. The Department of Food Science provides the best education in the country for students who plan to make a career in food science and technology.
2. The Department of Food Science is a primary force for the growth of the food industry in North Carolina.
3. The Department of Food Science is a leader in the development of new technologies for the food industry of the United States.
4. The Department of Food Science is an important national and international resource for new insights into fundamental biological, chemical and physical mechanisms which affect food safety and quality.

Goals of the Department:

1. To continue to improve our teaching programs so as to increase student numbers by attracting outstanding students at the undergraduate (both associate and baccalaureate programs) and graduate levels.
2. Increase the awareness of Food Science as a discipline of study and scientific career.
3. Enhance opportunities for faculty involvement and growth of the existing research centers, as well as promote opportunities for additional centers.
4. Periodically evaluate departmental administrative and operational procedures to assure that these procedures are keeping pace with growth and program changes.
5. Utilize the Industry Advisory Council to assist the department in developing and maintaining excellence in all program areas.
6. Continue efforts to develop innovative and effective extension/research programs with active cooperation and collaboration among faculty.

A series of measurable and attainable objectives were formulated to support each of the stated goals. New committees are being formed to define and implement the objectives and goals. The faculty objective in this ongoing process is to find a more unified view of who we are, where we are going and how we can better serve our clientele as we meet some of the pressing problems of the future.

INSIDE
Food Science Student Achievements:
College Bowl Team
Chapter of the Year
Scholarships, Graduates
Extension Highlight
Industry Advisory Council
Research Centers: New Projects
and Patents
Activities and News
Late Afternoon Course Offerings
COLLEGE BOWL TEAM SECOND AT NATIONAL IFT

The North Carolina State University Food Science College Bowl Team won Second Place in the national College Bowl Competition at the national IFT meeting in June. The NCSU team, consisting of Joseph George, Janelle Howe, Bruce Hein, and Diego Darquea (Alternate — Carolyn Roff, Coach — Elaine Berry), won the right to represent the Southeastern Region by a victory over teams from the University of Georgia and Virginia Tech at the Southeast Area Regional Competition held in Raleigh in February. The team’s practices included a sound defeat of an NCSU faculty team during the April Food Science Club Meeting. At the national competition in Dallas, the NCSU team defeated the University of Arkansas team in the first round play, but lost to the Utah State team in the final round. Other competitors included College Bowl teams from Kansas State University, University of Wisconsin-River Falls, and University of Maryland. A prize of $750, provided by Phi Tau Sigma, was awarded to the NCSU team for their second place standing. Congratulations for an excellent season, NCSU College Bowl Team!

—Elaine Berry

FOOD SCIENCE CLUB WINS CHAPTER OF THE YEAR

The Food Science Club culminated the 1990-91 school year with the announcement of first place in the IFT Student Association Chapter of the Year competition at the annual meeting in Dallas. Outstanding student and faculty participation in club activities throughout the year propelled the club to this honorable award. The club captured the Chapter of the Year award by sponsoring a variety of social, fund raising, student development, community service and regional IFT activities. Highlights from the year include: barbecuing chicken for the fall kickoff, operating the dairy bar at the state fair, hosting a Carolina-Virginia sectional meeting, providing entertainment for the Christmas party, organizing the wine and cheese party, hosting a regional student association college bowl competition, sponsoring a blood drive, holding the student symposium and having a spring picnic. In addition, guest speakers, professors and companies spoke at monthly meetings and a freezer replacement or "dry" year fund was established. Faculty, staff and students are to be commended for the success of the club during the past year.

—Christine Averdung

OUTSTANDING CLUB MEMBERS

Bruce Hein and Julie Northcutt were elected the Outstanding Undergraduate and Graduate Members by the Food Science Club for 1990-91. Bruce served on the executive board as an Activities Co-chair. He was the primary organizer and moderator for the regional IFT meeting in Raleigh last fall, and was involved with most of the other activities listed above. Julie was club President and provided effective leadership for a very successful year; she seemed to take on any other job that needed doing. At the spring picnic, both students were presented plaques by outgoing Senior Advisor, Dr. Allen.

SCHOLARSHIPS/FELLOWSHIPS

Twelve students in Food Science have won scholarships or fellowships in national competition for 1991-92. The Institute of Food Technologists (IFT) awarded undergraduate scholarships to Cheryl Gaither, Mr. Arden, NC; Hillary Hunt, Mr. Clinton, NC; Diego Darquea, So. Ecuador; Carol Tompkins, Jr., Springfield, VA; Christy Wilson, Mr. Clinton, NC; Gregory Gilleland, Jr., Newton, NC; John Roberts, Sr., Newton, NC and Vanesa Daniels, Jr., Castalia, NC. IFG Graduate Fellowships were awarded to Polly Dimnshore, MS, College Station, TX, Tim Fairchild, MS, Cary, NC, Christine Averdung, MS, College Station, TX, and Kelly Rodgers, Ph.D., Charleston, IL.

Recipients of scholarships awarded by the department will appear in the next newsletter. The Food Science scholarships have helped in the recruitment of outstanding students as evidenced by the number of IFT scholarships recipients. Currently all Food Science majors with a grade point average of 3.0 and above receive a scholarship provided by the food industry and its leaders. Alumni can help in our recruiting efforts by alerting good students to the career opportunities in Food Science and the scholarships available at NCSU.

—V. Jones

FOOD SCIENCE GRADUATES

Diplomas were presented to 18 graduates in Food Science at May Commencement. B.S. degrees were earned by John Deluca (Smithtown, NY); Allen Ames (Horsehead, NY); Terry Caviness (Lakeview, NC); Ginger Goodman (Salisbury, NC); Maya Kryger (Lakeland, FL); Laura Wilison (Raleigh, NC); Lutitia Strowbridge (Goldsboro, NC); and Keith Petrofsky (St. Louis, MO). Ph.D. diplomas were presented to Catherine Culver (North Towson, NY); Linda Harris (Kitimat, Canada); Peter Muriana (Bridgeport, CT); Dennis Romero (St. Paul, MN); and Barry Yang (Taipei, Taiwan, ROC). Master of Science degrees were presented to Debra Daum (State College, PA) and Thomas Britton (Bristol, VA). Associate degrees were awarded to Andrea Bradshaw (Raleigh, NC); Albert Colwell (Raleigh, NC); and Alan Whitley (Wadkinville, NC).

BRUCE AMES LECTURES IN FOOD SCIENCE DEPARTMENT

Dr. Bruce N. Ames, director of the Environmental Health Sciences Center at the University of California, Berkeley, spoke on "Causes of Aging" at an informal seminar sponsored jointly by the Departments of Food Science and Toxicology on February 11. Dr. Ames spoke about the damage to DNA that occurs in all cells as part of the normal process of respiration. He discussed the nutritional and physiological mechanisms that are employed by the body to limit the damaging effects of oxygen radicals and anions that are a result of breathing and consuming oxygen. (Continued on page 4)
EXTENSION HIGHLIGHT
Donn R. Ward

HACCP in the Seafood Processing Industry

Over the past ten years there has been a growing concern among U.S. consumers regarding the quality and safety of seafoods. What precisely triggered this is a matter for speculation; increased consumption of seafoods, recognition of a number of pathogenic microorganisms indigenous to the marine environment, increased interest in the consumption of raw seafoods (sushi), greater awareness of parasites, or a greater awareness of pollution and the potential uptake of these pollutants by food fish. No doubt a combination of these factors, as well as others not mentioned, have fueled the debate regarding the issue of seafood quality and safety. As an outgrowth of this issue, a number of consumer groups have focused on the fact that the seafood industry is not inspected in a manner comparable to the meat and poultry industries. The underlying premise is that continuous inspection, as practiced in the meat and poultry industries, would somehow assure a greater level of quality and safety.

Because of the growing public and Congressional perception that consumption of fishery products in the U.S. may present an unacceptable health risk to consumers, in 1988 Congress mandated that the National Marine Fisheries Service (NMFS) design an improved system of inspection and certification for fishery products based on the Hazard Analysis Critical Control Point (HACCP) concept. The model program developed from this study is the basis for a national seafood surveillance program that Congress has been debating relative to mandatory seafood inspection legislation.

One of the key elements of a HACCP program is training. Thus, with the prospect of a Congressionally mandated HACCP surveillance plan emerging, the National Fisheries Institute (NFI), the seafood industry's trade association, recognizing that no uniform organized training directed to the specific needs of the seafood processing industry existed, contracted with the NCSU Department of Food Science to develop a National Training and Certification Program for the Seafood Processing Industry. The training program is directed to processing plant supervisory personnel. It introduces the principles of HACCP, provides instruction as to how to identify potential hazards associated with various seafood products, discusses the concept of critical control points, and the monitoring and record keeping required of these points. The training reaches beyond HACCP per se, and incorporates topics that are fundamental to food processing operations: microbiology, sanitation, product identification and product integrity, contaminants, product additives, and more. The intent is not just to teach an understanding of HACCP, but also to create an awareness of the major safety and quality issues related to seafoods, and the student's role in assuring safety and quality in the food distribution continuum from the producer to the consumer.

One of the challenges in developing training for the seafood industry is the large number of fish and shellfish species available in the U.S. and the many different practices used to process the various species. Since hazards differ with species and processes, it is important to assist the industry in recognizing and understanding these differences. An additional challenge is the definition of a "hazard". The traditional HACCP concept views a hazard strictly from a food safety perspective. The seafood program defines a hazard in a much broader sense; it encompasses not only food safety, but also food/plant hygiene and economic fraud. This more liberal definition makes it a bit more challenging to develop and implement an effective HACCP program.

The training program takes three days and is divided into sections with a test given for each section. Students achieving a passing grade are certified by NFI.

Currently, the NMFS and the Food and Drug Administration (FDA) are conducting a pilot seafood HACCP inspection program for companies that wish to voluntarily be inspected using the HACCP concept. Our training is being used to train companies entering the program. Ultimately the objective is to train other extension and Sea Grant specialists from around the country to use the training materials we have developed to train industry personnel in their respective states.

Development of this training program has been a team effort. Those participating include: Dr. Dave Stuber (U. Wisconsin); Dr. Bob Price (U. California, Davis); Dr. Steve Owell (U. Florida); Dr. George Picket (Va. Tech); Dr. Mike Moody (LSU); Mr. Roy Martin (NFI); Mr. Bob Collette (NFI); Mr. Joe Slavin (Consultant to NFI); Mr. John Emerson (Consultant to NFI); Mr. Chuck Arnold (NCSU) and Dr. Donn Ward (NCSU).

PHI TAU SIGMA INDUCTION AND SEMINAR

The North Carolina Chapter of the Phi Tau Sigma Honorary Society held its annual ceremonies for induction of new members and officers on April 15, 1991. New members added to the society roster were Hal E. Bland, Viviane A. Burdick, Patricia Curtis, Edgar Hardy, Stanley G. Herndon, and C. Howard Isley. New associate members are Food Science Department undergraduates Keith Petrofsky and Carolyn Roff, and graduate students Andrew Butler, Tim Fairchild, Dolly Joseph, Peychil Lee, Jeffery Jackson, Gwen Nystrom-D’Amello, Kelli Rodgers, Kelly Stevens, Jiangping Wu and Peifang Zhang.

Dr. Fred Tarver led the initiation ceremony for the new officers, Dr. Neil Webb, President; Dr. Brian Sheldon, President-elect; Dr. Duane Larrick, Secretary-treasurer; Dr. Tyre Lanier, Counselor; and Dr. John Rushing, Alternate Counselor.

Prof. Owen Fennema, University of Wisconsin, presented a seminar on "Edible Films". Dr. Fennema, a renowned food chemist, discussed his research on development of films for coating food ingredients to create barriers between components with different properties. The barriers could help to maintain the properties of the individual components during processing and storage. Coatings on fruits and vegetables are the only current uses of such edible films.
INDUSTRY ADVISORY COUNCIL BEING FORMED

The Department of Food Science is in the process of selecting members for an Industry Advisory Council (IAC) to assist and advise the department in development and evaluation of programs. Guidelines for the formation, function and operation of the IAC were recently prepared by a committee headed by Donn R. Ward, Specialist-in-Charge. A synopsis of that document is included to show the rationale, scope and benefits to the department and the food industry of this council.

Rationale: The need to improve cooperation between industry and academic institutions in many areas of mutual interest is particularly apparent in the case of a major food science department and food industries. The latter are the proving grounds for the products (students) of our educational programs, the users and adapters of the research knowledge we generate, and the supporters/critics of our teaching, research and extension programs...

The department has the broad responsibility of maintaining a good liaison and rapport with the food industries of North Carolina and the nation. Establishing an Industry Advisory Council (IAC) to the Department of Food Science will significantly increase the effectiveness with which the department relates to industry. Significant benefits will also accrue to the College of Agriculture and Life Sciences and to the university community as the ability of the Department of Food Science to more effectively serve its user clientele is increased.

Function and Purpose: The industry advisory council will be informed on a continuing basis about the teaching, research and extension programs and future plans of the Department of Food Science. The IAC will:

- Assist the department in increasing the effectiveness of its interactions with industry, the major employer of departmental graduates.
- Aid the department in identifying and prioritizing food processing needs...which represent potential research and extension opportunities.
- Assist in identifying potential opportunities for transfer of research and technology that results from departmental programs.
- Periodically review Food Science programs and objectives...to strengthen teaching, research and extension activities.

Scope: The Department of Food Science has earned state, national, and international reputations for excellence...The IAC should be composed of companies and associations that represent the interests of the state, as well as those whose interests extend nationally and internationally.

The department recognizes that it has a major obligation to the citizens of North Carolina. In addition, it is aware that much of the agricultural food products produced within the state are sold in other areas of the United States, with an increased volume going to export markets. Consequently, the IAC should be composed of representatives from North Carolina as well as other areas of the United States. An IAC with broad representation will be able to discern research and educational programs that meet the needs of North Carolina agricultural-based food industries as well as the requirements of national and international markets.

Composition: The Industry Advisory Council should be representative of as many aspects of the food processing industry as practical. The IAC will initially be established with members from North Carolina industries, associations and government agencies, and from corporations, associations and government agencies that are involved in national/international food processing and would not be restricted to North Carolina organizations. Nominations for membership on the IAC will be solicited from faculty and from members of the IAC annually. Members will serve three-year terms.

Some benefits anticipated for the Department of Food Science are:
- Enhanced viability with the leadership of the food processing industry in North Carolina and the nation.
- Creation of a unified body in North Carolina to bring together the leadership of the various agricultural commodity groups, food processing industries, industry associations, and regulatory personnel with a broad view of North Carolina's and the nation's food processing industry.
- To receive from the Council timely information and advice concerning trends and concerns that impact North Carolina's and the food industry as a whole.
- To receive advice on directions of future research, extension and teaching programs.

Benefits for members of the IAC are:
- To receive timely information about the department's activities.
- To have a focal point to address common issues concerning developing technology, food safety, competitiveness, regulations, etc., and to receive input from various university resources.
- To develop a better understanding of the department's and the university's capabilities to meet their individual and collective needs for information and education.
- To have an impact on specific and broad programs of interest to the industry.

If you would like additional information about the Department of Food Science Industry Advisory Council, please contact David R. Lineback, Department Head, or Donn R. Ward at The Department of Food Science Extension Office.

AMES—Continued from page 2

[Some of these factors, vitamin E, β-carotene, and superoxide dismutase are among the active research interests of members of our faculty.] Dr. Ames noted that very low calorie diets reduce aging in animal models by slowing cell replication, which is tied to the rate of genetic mutation. Dr. Ames was on campus to deliver the Seventeenth Annual Brooks James Memorial Lecture on "The Causes of Cancer".]
NEW PROJECTS FROM SDFRC

The Southeast Dairy Foods Research Center has recently made awards totaling over $700,000 for nine separate two-year research proposals from Food Science faculty in the center’s two member institutions, NCSU and Mississippi State University.

Five of the projects represent collaborative research between Drs. Harold E. Swaisgood, George L. Catignani, E. Allen Foegeding and Jonathan C. Allen in the areas of milk protein chemistry. Dr. Swaisgood will focus on immobilized proteins and enzymes for study of protein interactions, and for separation and processing of milk components. For example, one project will design techniques to separate the whey protein β-lactoglobulin from milk. Dr. Foegeding’s work will investigate the functional properties of the separated proteins. These results might help to develop ingredients that can be used to change the texture of foods. Dr. Allen will study the ways that calcium interacts with these isolated and processed protein systems, and use different processing techniques to reduce the potential of milk proteins to cause allergy. Drs. Swaisgood, Catignani, and Allen will look for particular regions of milk proteins that help give them their functional properties, such as solubility, emulsifying and gelling properties, and the ability to bind calcium.

Dr. Steven J. Schwartz, another NCSU food chemist, will separate different lipids from butter with supercritical carbon dioxide fractionation. These oils can then be purified and combined with other ingredients to make products with desired chemical, functional and nutritional properties.

Detection of bacterial spores in raw ingredients with monoclonal antibodies is a goal of the project awarded to Dr. Peggy M. Foegeding. Success in this project will permit rapid screening of ingredients to be used in a new class of minimally processed, premium quality products with long shelf lives. Two proposals by Dr. Charles White of MSU were also funded for development of low calorie yogurt with alternative sweeteners and bulking ingredients, and use of bifidobacteria in cultured/fermented dairy products.

The SDFRC, sponsored primarily by the National Dairy Promotion and Research Board, is entering its fourth year. Its goals are to support fundamental research that can be used to develop new products and strategies to increase the consumption of milk. The projects in this department funded for the next two years will support ten research associates and graduate students, whose training will contribute solutions to the needs of the dairy industry now, and for many years in the future. New corporate members of SDFRC are needed in the next few years to continue and expand these efforts.

CAPPS AWARDS GRANTS

The directors of The Center for Aseptic Processing and Packaging Studies (CAPPS) awarded grants for four projects to Food Science Department faculty at their Spring meeting. These projects were: Dr. P. M. Foegeding, $28,844. Designing Biological Indicator Organisms; Drs. P. M. Foegeding and N. A. Klapes, 829,136. Analysis of Inactivation Data for Continuous Processing; Dr. Klapes, 840,700. Methods for the Preparation of Hydrogen Peroxide Resistant Bacillus; Dr. S. J. Schwartz, 817,500. High Temperature, Short-Time Particulate Processing under Aseptic Conditions.

CAPPS FIRST PATENT AWARDED

"Thermal Memory Cell and Thermal System Evaluation", the first CAPPS patent filed with the U.S. Patent Office was awarded on June 4, 1991. The original patent, filed in December, 1988, was a complex mixture of Food Processing, Semiconductor Technology, and Data Processing, and consisted of 45 claims.

The Thermal Memory Cell (TMC) can be used to determine three of the most important parameters in Aseptic Processing containing Particulates: (a) The thermal history (or Time-Temperature profile) of particle centers, (b) The Residence Time Distribution (or RTD) of a system of particulates, and (c) the film side Heat Transfer Coefficient at the fluid-particle interface.

The TMC uses the latest developments in semiconductor technology and hence can be made millimeter size. At present however, tests are being conducted on a larger module. The "TMC test package", as the module is known, is approximately 1"×4"×1/4" in size, and therefore is easier to handle for testing purposes. "Even at its present size, it is still smaller and less bulky than anything available commercially," says Dr. S. Ganesh Ganesan, one of the principal research scientists working on the development of the TMC. "Coupling this with the fact that the TMC requires no wires or batteries, makes it a very useful remote thermal sensor with an infinite shelf life."

Efforts are underway to test the TMC package under typical aseptic conditions in a lab scale UHT system developed at N.C. State University by John Miles, Project Engineer at CAPPS. The next phase involves conducting similar tests at pilot plants of CAPPS member companies. The TMC can be used for many functions, including testing and designing process systems, quality assurance of existing processes, and as a Time-Temperature Indicator during product distribution.

—J. Giles

N.C. DAIRY TECH SOCIETY HOSTED

The Food Science Department served as host to the North Carolina Dairy Technology Society’s April Meeting. The purpose of the meeting was a tour of the NCSU Dairy and Process Applications Laboratory, with a focus on the operation of the Cherry Burrell EQ3 packaging machine, which has helped NCSU produce milk in cartons with over one month shelf life. Mr. David Pendleton of Cherry Burrell explained the equipment and Mr. Gary Cartwright, Plant Manager, discussed its role in the operations of the NCSU dairy plant.
FACULTY ACTIVITIES

Jonathan Allen presented a talk on "Molecular and cellular mechanisms for zinc entry into and availability from milk," at the First Annual Institute of Nutrition of the University of North Carolina Research Symposium, March 22 at the McKimmon Center. Speakers were recipients of the institute's first round of research grants. Nine of the twenty-nine researchers were from NCSU, including Dr. George Catignani who gave a talk on "Cis-Isomeric Beta Carotenes in Human Serum."

Leon Boyd was elected to the steering committee of the Carolina-Virginia Section of IFT for 1991-1992.

Dr. Henry P. Fleming, USDA-Food Science, is one of three persons to receive a 1991 National Award for Agricultural Excellence from the National Agri-Marketing Association (NAMA). Fleming is being honored for his contributions in the preservation of vegetables by fermentation and direct acidification—work that has caused dramatic changes in the pickle and sauerkraut packing industries. Through a collaborative research effort, he has solved several problems of spoilage during cucumber and sauerkraut fermentations, saving the industry $20,000 annually. He received a plaque commemorating the award and a $1,000 check at a luncheon in New Orleans April 4.

E. A. Foegeding presented an invited talk at the 1991 IFT-VFOS Symposium: "Physical Chemistry of Foods." He has been awarded two grants from the Southeast Dairy Foods Research Center.

Peggy Foegeding along with students and a technician, presented two papers/posters at the American Society for Microbiology General Meeting in May and three at the Institute of Food Technologists Annual Meeting in June.

M. E. Gregory received a $25,000 competitive grant from USDA entitled "A training program in sanitation and food safety for childcare personnel"—beginning July 1, 91 to July 1, 92. He gave an invitational paper at the 1991 IFT meeting in Dallas entitled "Foodservice Sanitation Training for Certification: A Model Program."

Hosni M. Hassan gave a lecture on "Oxygen Toxicity As Related to Anaerobic Bacteriology" as part of an "Advanced Anaerobic Bacteriology" course organized by Stanford University Medical Center and Anaerobic Systems Inc. and held in Monterey, California June 24-29, 1991. He received an 880,000 NSF Grant for 1991-1992 to work on the "Regulation of Manganese Superoxide Dismutase in Escherichia coli: Isolation and Characterization of the Repressor Protein" (Total = $240,000/3 yrs).

Arthur Hansen was selected by NCSU to receive the Outstanding Teacher Award for 1990-1991. He received the following grants: "Functional Properties and Sensory Qualities of Oat Fiber in Low Fat Frozen Dairy Desserts" from ConAgra and "The Functionality of Carrageenan In the Stabilization of Nutritional Beverages" from Marine Colloids. In May 1991, Hansen gave a seminar on aseptic processing and packaging of ultra processed dairy foods at Kohler Mix, Great Bear Lake, MN and also gave a seminar at Cherry Burrell in Louisville, KY, on aseptic processing and packaging of ice cream mix. Of local interest, he presented talks to the N.C. Dairy Tech Society and to the Raleigh Heart Association on low fat and fat free yogurts, and low fat and fat free dairy foods of the future. He also spoke at the University of Maryland Ice Cream Conference on low fat and fat free frozen desserts. Hansen will present a paper entitled "Functional Properties and Sensory Qualities of Cellulosic Gel in Low Fat and Fat Free Frozen Dairy Products" at the 68th annual ADSA meeting in Logan, Utah, August 12-15, 1991.

Todd Klaenhammer has been busy on the lecture circuit, presenting the following invited lectures this spring: "Bacteriocin systems in foods: designing antimicrobial peptides," at the Research Branch Seminar, Agriculture Canada, Ottawa, in March. "Designing antimicrobial proteins for use in foods," STELA-Universite Laval, Quebec City, Canada, March. "Development of bacteriophage resistant strains of lactic acid bacteria," Colloquium on Food Biotechnology, Royal Biological Society Meeting, University of Reading, UK. "Food Biotechnology--Bridging the Gap." IFT Scientific lectures presented at Texas A & M and the Northern Indiana section of IFT, April. "Genetics and regulation of bacteriocin production by lactic acid bacteria." Symposium presentation at the 1991 Annual meeting of the Institute of Food Technologists, June.

N. Arlene Klapes received a new grant on: "Comparative methods for the Preparation of Hydrogen Peroxide-Resistant Bacillus subtilis subsp. globigii Spores," $40,700 granted through CAFFS. She attended the American Society for Microbiology meeting in Dallas on May 6-9 and presented a poster entitled "Recovery media for Bacillus subtilis subsp. globigii treated with hydrogen peroxide" (coauthors: P. M. Foegeding and N. W. Stanley). Two graduate students also presented research findings at this meeting: Kelly Stevens - "Nisin Inactivation of Salmonella Species" (coauthors: Klapes, B. W. Sheldon, and T. R. Klaenhammer) and Lisa Abler - "Inhibitory Activity of Synthetic Magainin 2 Against Selected Foodborne Pathogens" (coauthors: Klapes and Sheldon).

D. R. Lineback was re-elected to the Board of Governors of Food Update (1991-94), elected president-elect of IFT, and received the Carl E. Fellers award of Phi Tau Sigma/IFT. He presented a lecture on "Management Expectations of Professionals in the University" at a special session in the Brunner Protein Symposium at Michigan State University and gave two invited presentations titled "Food Safety: Perceptions and Realities," and "The Path of Leadership" at the final session of the Phillip Morris Agricultural Leadership Development Program, Pinchurst NC. Lineback was an invited speaker at a symposium on starch at General Mills, Minneapolis and an invited participant in a teleconference on "Environmental Aspects of Cancer" sponsored by the American Cancer Society, NC Branch. He also participated as a member of the Scientific Advisory Committee for the proposed Center on Human Nutrition and Chronic Disease Prevention of Bowman Gray Medical School, Wake Forest University, Winston-Salem.

Brian Sheldon was appointed section editor (Processing and Products) of Poultry Science Journal. He was an invited speaker to the N.C. Poultry Processors workshop.
on "Waste Issues of the 90's," presenting "Research Overview of Poultry Chiller Water Recycling Systems." Dr. Sheldon was nominated to the Poultry Science Association's Environmental Quality Committee and elected as Vice President of the NCSU Chapter of Phi Tau Sigma.

Harold E. Swisgwood received the 1991 Award of Merit from the NCSU Chapter of Gamma Sigma Delta (The Honor Society of Agriculture). He presented an invited paper at the Nestle/Westresco Mini Symposium on Milk Protein Functionality, May 30-31, 1991.

Lynn Turner was selected as one of North Carolina State University's outstanding teachers for 1990-91. He attended the 1991 National Association of Colleges and Teachers of Agriculture (NACTA) conference.

William M. Walter made an invited presentation: "Frozen Sweet Potato Technology for the 21st Century Meeting held June 2-6, 1991, in Montgomery, AL.

Donn R. Ward co-edited a book entitled Microbiology of Marine Foods Products along with Cameron R. Hackney of Virginia Tech (Dr. Hackney received his Ph.D. from this department). He also received a grant from the National Fisheries Institute to develop a HACCP Training and Certification Program for the Seafood Processing Industry. Other members of the development team are from Food Science Departments at the University of Florida, LSU, University of California at Davis, University of Wisconsin, and Virginia Tech.

STUDENT, STAFF AND ALUMNI NEWS

Tim Fairchild, M.S. student advised by P. M. Foegeding and K. R. Swartzel received an IFT Graduate Fellowship and won first place in the IFT Microbiology Division Z. John Ordal competition for best oral paper presentation.

Ms. Tonya Horton joined Dr. Hussain's lab for this summer (June 17-Aug. 9) as a National Institute of Health Research Apprentice.

NCSU graduate students will be well represented among officers of the IFT Student Association. Curt Emenhiser, a new Ph.D. student in the department, will be Chairman-elect, Christine Averdung was elected Southeast Area Representative. Also, Dr. Peggy Foegeding will be Faculty advisor.

Veteran Food Science employees were honored by the University at the annual Employee Recognition Luncheon. Sally Winn and Odell Wood were recognized for 30 years of service and Jesse Brown was honored in the 25 year category. Their dedication is appreciated by many in the department.

FROM THE DAIRY PLANT:

Odell Wood Retires: After 30 years of dedicated service to the Dairy Plant, Odell Wood hung up his boots on April 30. Odell was well rostasted by family and friends at his retirement dinner held at Ballentine's Restaurant on April 26. The Dairy Plant will miss his experience and dedication.

Karl Hedrick III has been promoted to Dairy Plant Supervisor, Tony Chason to Operator II and David Stewart was hired on April 8 as a Dairy Plant Operator. Join us in wishing them a long, successful career.

The Dairy Plant has a new name. We are now the Dairy and Process Applications Laboratory - but we'll still answer to Dairy Plant, Creamery, Milk Plant…

IN THE DEPARTMENTAL OFFICE:

After eight years of hard work and effort for our department. Mrs. Rose Howard submitted her resignation effective May 31, 1991. In a very demanding position. Rose has shown great dedication and effort as our departmental bookkeeper. We thank her for that and wish her and her family the best of everything in the future.

Ms. Rose Marie Weatherford has assumed the duties of reconciling accounts and keeping bills paid.

NEW PEOPLE:

Dr. Klaushammer's lab reports Dr. Gracilda De Antoni, Visiting Professor from the University of La Plata, Argentina will be at NCSU for one year working on a SDFRC project on genomic characterization and development of integration vectors for Lactobacillus. Dr. Cheol Ahn, post-doctoral research associate from the University of Alberta, Edmonton, Canada will be investigating the structural and functional properties of antimicrobial peptides from Lactobacillus. Dr. Christophe Fremeaux, post-doctoral research associate from the University of Bordeaux, France. He is studying gene expression and processing systems for bacteriocins produced in Lactobacillus.

DEPARTING:

Dr. Raul Raya completed his Ph.D. Dissertation and is now at INRA, Jouy-en-Josas, Paris, in the laboratory of Dr. Alain Chopin, working on gene expression and regulation in lactococci.

ALUMNI NEWS:

Tammy Tsao (M.S. 1982) is currently a Senior Researcher with Best Foods Baking group, CPC International, Totowa, NJ. She recently visited the department with her husband and two children.

Allen Thomas (M.S. 1989) is now doing microbiology work for RSR laboratories in Bristol, Tennessee.

Doug Martin (B.S. Food Technology, 74) is a QA Supervisor with Ragu Foods Co. in Owensboro, KY. He and his wife of 18 years, Phyllis live in Utica, KY, with their 3 children, Matt, Ben and Ellen Ann. Doug's hobbies are children, coaching Little League baseball and basketball, and farming.

COURSE OFFERINGS FOR NON-TRADITIONAL STUDENTS

The Food Science Department tries to offer some of its courses at times that might meet the demands of people working in the Triangle area who would like to take some food science courses or even work toward a degree. During Fall 1991, we will offer FS 400, Principles of Human Nutrition at 4:05-5:20, Tues. and Thurs.; FS 585, Theology, is taught at 8:05-8:55 a.m. Tues. and Thurs. with a Fri. afternoon lab. The graduate seminar course, FS 680 is taught Fall and Spring semesters 3:40-4:30 Wednesdays. During Spring 1992, FS 403, Food Analysis meets 2:35 to 3:30 Mondays and 3:40 to 6:30 Wednesdays.