

# Food Science Newsletter

June 2006



## INTRODUCTION

Again, we come to you in your home or office and bring you greetings from the Food Science Department at UW-Madison. We continue to be surrounded by change. The college has a new dean, Molly Jahn, a plant geneticist from Cornell University; she begins her new duties on August 1, 2006. On July 1, 2006, a new chairman heads the Food Science Department—He is Srinivasan Damodaran. The new Microbial Sciences Building across the street continues to grow and will be much larger than the Bacteriology Building that is being replaced. The street between the Natatorium and parking lot 62 is still torn up to ultimately provide cooling and heating services to the campus.

When Harold Calbert was departmental chairman, from time-to-time, he prepared a “Christmas Letter,” perhaps 2-to-3 pages in length, which described some departmental happenings and was sent to alumni. With his departure from the chairmanship, this practice stopped. Early in 1985, Daryl Lund, then chairman, felt we should again have a newsletter to tell our story to alumni and friends. He asked me to prepare the newsletter. I agreed and have been doing it ever since. How did that first newsletter of the “modern era” appear and what did it contain? The text appears to have been done with an IBM electric typewriter and the printing, although a cut above the old mimeograph process, was inferior by today’s standards. The newsletter opened with a message from the chairman which was followed by brief articles on the W. V. Price Cheese Research Institute, sensory analysis laboratory, aquaculture program and dairy plant. Also included was a list of titles and authors of recently completed theses, dates of events on campus, and faculty activities (3 pages). The newsletter also included a brief biography of a young food chemist who joined the faculty in 1984. His name is Srinivasan Damodaran.

My thanks go to Yvonne Bushland for help in obtaining information for this newsletter. Thanks also to those who contributed articles that appear on pages to follow and to Molly Fischer Bjork for preparing the manuscript so it could be printed. Printing and distribution of the newsletter was supported, in part, by the Wisconsin-Agriculture and Life Sciences Alumni Association (WALSAA).

*Elmer Marth*

*I'm sorry to report that Dr. Marth was diagnosed with leukemia this spring, and passed away shortly before publication of this newsletter. An article honoring Dr. Marth's life can be found on page 8.*

*Molly Fischer Bjork*

## From the Chairman - Bill Wendorff

Greetings from the Department of Food Science at the University of Wisconsin-Madison. We are finalizing the last year of our 5-year transitional plan, “Design for the Future.” I will be finishing my five-year term as Chair at the end of June. Within the Newsletter, you will read a message from our new incoming Chair, Prof. Srinivasan Damodaran. Damo and I will be working to make this transition as seamless as possible as we move through this upcoming summer session.

Over the past five years, we have had our share of challenges with the state budget shortfall and successive annual budget cuts. Since 2003, we have had an 8.8% decrease in our departmental budget. With 97.5% of our budget in personnel, this has been a challenge for us. We have had to cut our support staff from 3.5 FTE's to 2.5 FTEs plus downgrade three positions to meet the reduced budgets. This coming year's budget is flat, so that is a promising sign that we may be through the worst.

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In spite of the budget constraints, we have had some very positive experiences over the past 5 years. We have gone from a low undergraduate enrollment of 46 students in 2001 to 69-71 students over the last 2 years. We are servicing over 200 dietetics students with 6 food science courses. Over the past two years, we have gone through a complete assessment of our undergraduate curriculum and will be putting together a new revised curriculum at our faculty-staff retreat in June. This whole assessment and potentially revised program will be moving us toward a greater emphasis on the science of food in relations to health concerns.

Unfortunately, Phase II of the Babcock Hall remodeling project has been moved back again to the '09-'11 biennium. However, there may be a chance that some funding may be available in the next 2 years to move the food preparation labs, used by the dietetics students, from the Human Ecology Building to Babcock Hall. This will be necessary, since the School of Human Ecology is planning on remodeling its building in '09-'11.

In our December 2005 Newsletter, we introduced the public portion of our Food Science Educational Investment Initiative: Creating the Future Campaign. At that time, we had indicated that we had reached 57% of our target goal of \$7.2 million. Since then, we have received another \$110,600 in commitments and we are at 59% of our goal. We have reached our goal for endowed professorships, 47% of our goal for research assistantships, 12% of our goal for scholarships, and 9% of our goal for instructional and pilot plant equipment. We sincerely appreciate the support that you have provided thus further enhancing the teaching, research, and outreach programs of the Department by contributing to the Campaign. Further information on contributions is covered on the back of the Newsletter.

I have enjoyed the opportunity to serve as Chair on the Food Science Department over the past five years. I will return to full-time status as Extension Dairy Mfg. Specialist for possibly the next two years before retirement. We have an outstanding young faculty that has really broadened the expertise we have in food chemistry, food engineering, and food microbiology. In the past five years, with the "Design for the Future," we have been able to evaluate how we might better integrate that expertise into our instructional and outreach program. Under the guidance of our new Chair, Prof. Damodaran, we will continue to build on the expertise for continued excellence in our programs in the Food Science Department at UW-Madison.

**ON WISCONSIN!**

*Bill Wendorff*

### **Food Science Campaign Donors**

Since the December newsletter, the following people have graciously donated to the Food Science Educational Investment Initiative: Creating the Future. Details on how to donate are on the inside back cover.

Thomas & Tracy Arndt	William T. Hamann	Kim T. Manthei	Joseph R. Shebuski
Cargill Inc.	Ken & Joellen Heiman	Kren L. Merlau	Susan S. Sumner
Lindsey Christy-Klemens	Peggy Henninger	Franco X. MilaniOlson	Monica L. Theis
Maribeth A. Cousin	Barbara H. Ingham	Susan Nielsen	Russell A. Tietz
Carol L. Diebel	Aileen M. Kacvinsky	Pepsi Bottling Group	Ventura Foods
Linda G. Felton	Thomas a. Kelman	Foundation	Joe von Elbe
R.I. Fenton-May	Christian R. Kirk	Robert B. Rennebohm	Jerome & Karen Wallander
Galloway Company	Michael J. Mack	Bruce & Carol Seeman	Dana W. Wiseman
Robert & Yvonne Buhler	Edward L. Magee		

### **From the Chairman-Elect - Srinivasan Damodaran**

In his famous play 'As you like it', Shakespeare wrote, "All the world's a stage, And all the men and women merely players: They have their exits and their entrances; And one man in his time plays many parts....." On July 1, I will be assuming the role of the Chairperson of the Department of Food Science.

These are exciting times for food science. A paradigm shift is slowly but definitely taking place in food science: It is moving away from traditional production, processing, and product development-type research activities and entering into the fields of nanotechnology, biotechnology, and biophysical chemistry of food constituents. What is driving this integration of food science into the fields of biosciences is the society's increased awareness of the link between food and health and the industry's search for alternative food ingredients. The old paradigm of food-for-fun (or is it food-for-survival?) is being replaced by the new paradigm food-for-health and hence the demand for "functional foods".

At this juncture, the question we must ask ourselves is: are we prepared for this changing scenario? Do we have the necessary infrastructure in terms of faculty expertise and facilities to make changes within to take advantage of the emerging research opportunities and position the department on a stronger footing for the next 20 years? As a first priority, we need to initiate a discussion on this and define the strategic research areas that we should invest in now and be a leading institution for the next 20 years. Any structural imbalances that may exist in our program that impede achieving our strategic goals should be identified and addressed as well. We have a relatively young and energetic faculty. With additional retirements and replacements in the next four years, our faculty will be one of the youngest in 20 years and I look forward to acting as a catalyst to fire up their imagination and build a stronger department. The next few years are very critical, and if we really want to redefine our course this is the time to do it.

One of the trends that concerns me the most is the dwindling enrollment of graduate students in the department. There are several reasons for this situation, which include a decrease in the number of research faculty FTEs over the past 10 years, a stagnant level of research dollars, and the increasing cost of educating graduate students. The impending new policy on tuition remission is going to make the situation worse. The Food Science Education Fund drive, a part of which is earmarked for graduate assistantships, will address this issue to some extent but more needs to be done. A long-term strategy would be to develop research consortia partnerships with the food industry and use those funds to support graduate training. As I have often said, our graduate students are our ambassadors to the food industry and we must maintain and enhance these links. We will set up a task force to explore the consortium strategy and come up with recommendations by October, with next spring as the target date for its implementation.

These are exciting times for the department. My main message is it is time to change. What we do in the next four years is going to define the course of this department for the next 20 years.

*Srinivasan Damodaran*

### **Overview of Current Departmental Research**

Food Science faculty, their graduate students, and postdoctoral workers continue to do research on an array of topics of concern to the food industry. A summary of those topics appears in the following paragraphs.

#### **Whey**

This byproduct from cheese manufacture is being researched as follows: (a) production of whey protein concentrate with a clear, tasteless consistent flavor; (b) development of charged ultrafiltration membrane technology for whey protein fractionation; (c) improving whey protein isolate functionality for beverage applications; (d) dietary control of PKU with glycomacropptide from whey; (e) drying characteristics of delactosed permeate; (f) process technology to control color of dry whey products; (g) increasing whiteness of sweet whey powder; (h) improved process technology for value-added products from salty whey; and (i) control of annatto cheese colors in whey products.

#### **Cheese and Process Cheese**

Work on cheese and on process cheese is being done. Topics of research include the following: (a) cheese serum component's role in inhibition of calcium lactate crystallization; (b) relating rheological properties to cheese functional performances; (c) understanding structure/function relationships in cream cheese responsible for its performance; (d) applications of membrane processing for cheese manufacture; (e) a chemistry-based approach to understand process cheese functionality; (f) design of low-fat process cheese suitable for baking applications; (g) authenticating the flavor and functional character of U.S. made Hispanic Cheese; (h) linking filled milk with authentic Hispanic cheese flavor; (i) chemical characterization of black spot defect in cheese; (j) identifying energy sources used for growth of non-starter lactic acid bacteria in ripening cheese; (k) moisture migration to cheese pieces in process meats; and (l) microstructure and functionality of process cheese: the role of milkfat.

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### **Other Dairy Foods**

Limited attention is being given to dairy foods other than cheese. Here is a list of topics being investigated: (a) development of process technology for dried sheep milk products; (b) understanding the structure-function relationships that control the rheological and sensory properties of stirred-type yogurt; (c) Physical and chemical interactions responsible for development of yogurt texture; and (d) Phase I: substantiating advantages of fermented milks as delivery vehicles for *Bifidobacterim*.

### **Food Safety**

This topic continues to be important and is being addressed by the following projects: (a) HACCP assistance for small and very small meat processors: Challenge studies and predictive modeling for validation of critical limits; (b) exposure assessment for foodborne *Streptococcus pyogenes*; (c) cranberry juice as a an anti-pathogen additive to apple cider; (d) antimicrobial effects of acidic marination of pork; (e) lactic acid bacteria as thermotolerance surrogates; (f) predictive modeling of pathogen growth in raw meat; (g) control of acrylamide in processed foods: chemical intervention technology; and (h) effects of cheese solids and condiments on Clostridium botulinum in process cheese products.

### **Nutraceuticals**

The following topics in this area are being studied: (a) nutracentic aspects of ginkgolide lactones found in ginkgo tree leaves; (b) identifying cancer chemopreventative agents in soybeans; (c) selenium-enriched vegetables as dietary vehicles for delivering cancer chemopreventive benefits; (d) control of organosulfur transformation in *Alliicim* through processing for retention and health-related bioactivities; (e) identifying potentially anticarcinogenic compounds in common vegetables; and (f) identifying potentially cancer preventive agents in maize *Zea mays*.

### **Other topics**

A variety of other subjects are also getting research attention and are listed here; (a) peptide cryoprotectants; (b) virus-ligand interactions in adsorptive membrane biosparations; (c) ice crystallization in a scraped surface heat exchanger; (d) micro-spectroscopic study of moisture mobility in amorphous saccharide materials; and (e) novel food ingredients from food protein-polysaccharide complexes.

If you are interested in information about any of the aforementioned projects, please call the departmental office (608) 262-3046) and you will be put in touch with the responsible faculty member.

*Elmer Marth*

## **Food Science Extension and Outreach Activities**

Another successful year of extension programming is in the books, so to speak. The Web-based materials continue to be a source of new programmic development and client support. A few specific highlights to note include: (a) Department homepage: <http://www.wisc.edu/foodsci/>, (b) The overall short course calendar is at: <http://www.wisc.edu/foodsci/conted/>, (c) For consumer safety, Barb Ingham's Food Industry Research Service and Training webpage: <http://www.wisc.edu/foodsafety/>, (d) The Center for Meat Process Validation: <http://www.wisc.edu/foodsafety/meatresearch/> and (e) Apple Cider Safety: <http://www.wisc.edu/foodsafety/cider/index.htm>.

**Rich Hartel** will be coordinating the 44<sup>th</sup> version of the Resident Course in Confectionary Technology, co-sponsored by the National Confectioner's Association. Dates are July 9-21, 2006.

This past year, **Bill Wendorff** had over 350 students from the dairy industry in the short courses that were offered. He worked with the Wisconsin Association for Food Protection to transition the coordination of the Dairy and Food Plant Wastewater Short Course for future years. This past November, 23 dairy plant operators earned continuing education credits for renewal of their license. A chapter on sheep milk production and processing that was coauthored by Wendorff with Dr. George Haenlein, of the Univ of Delaware, has appeared in a new book, "Handbook of Milk of Non-Bovine Mammals," published by Blackwell Publishing. In July, Bill will be returning to full-time status as dairy manufacturing specialist.

**Steve Ingham** continued efforts to provide scientific information and decision-making tools for use by meat processors validating their HACCP plan critical limits or evaluating process deviations. These efforts resulted in the Isothermal-Based Prediction Tool for evaluating potential pathogen growth during short-term temperature abuse or extended slow-cooking of raw meats. This predictive tool is available on-line at a website <http://www.wisc.edu/foodsafety/meatresearch> developed by **Dr. Barbara Ingham** and her Outreach Specialist, Justin Kral. Summaries of other validation studies are also available on the website. During the fall semester, Steve spent a sabbatical with the Wisconsin state meat inspection program. This sabbatical resulted in development of model HACCP packets meeting all state regulatory expectations that can be used by meat and poultry processors.

**Scott Rankin** coordinates programming for four events (three offered biannually) including the milk pasteurization course, premium ice cream course, cheese grading and evaluation course, and Wisconsin dairy field rep's annual meeting. Over 300 professionals attended these programs over the last year. Additionally, Scott acts as chair for the FFA dairy foods career development event, attracting nearly 300 high school students from throughout Wisconsin.

*Scott Rankin*

### Update on Undergraduate Curriculum

The Food Science Department is nearing completion of a thorough review and revision of the undergraduate curriculum. The concerns that have led to this 3-year-long process include: (i) a lack of electives in the program, (ii) an uneven distribution of major courses (no required Food Science courses in the first two years and a heavy senior load), and (iii) the lack of certain topics in the curriculum, i.e. sensory and product development. The Department has acknowledged that we have a strong undergraduate curriculum that can be strengthened by this thorough review. In this revising, there is continued emphasis on critical and integrative problem-solving, a dedication to maintaining and increasing program rigor, and a commitment to teaching of core disciplines while having flexibility in course offerings.

Goals set forward in a day-long retreat last summer are close to being met with a revised undergraduate curriculum:

- The undergraduate curriculum will be reformed into an integrated sequence of courses beginning with core courses outside the major, i.e. chemistry, biology, physics, math, taught largely to freshmen and sophomores; progressing to junior-year foundation courses within the major: food chemistry, food microbiology, food engineering; food processing; food analysis and food law; and culminating with senior-level integrated courses (Integrated Food Manufacturing; Integrated Food Functionality) that build on core and foundation knowledge. Learning outcomes have been developed for department courses. These learning outcomes are being placed into new or existing courses and will guide instruction in these areas. Learning outcomes challenge our students to know or understand basic concept, or be able to apply, or critically evaluate more advanced material.
- A sophomore-level gateway course is being developed which will introduce students to the field and set the foundation for other courses taught by the department.
- An introductory course, *Discovering Food Science*, will continue to be offered to second-semester freshmen and those entering the major. The goal for this course is to retain students in the program and recruit those interested in the major. Professor Rich Hartel has developed novel teaching strategies to engage students in this material.
- The senior experience will challenge students to participate in original research and to present their work in a senior seminar. Integrated courses in food functionality and food manufacturing will give our students exposure to product development and other areas currently lacking in the curriculum. Integrated commodity courses will allow our students to gain expertise in at least one core area.

The Curriculum Committee welcomes your input as we move towards the adoption of this new curriculum. Barbara Ingham (senior co-chair 2005), John Lucey (senior co-chair 2006).

*Barbara Ingham*



### **News from the Food Science Club**

This past semester has been a very exciting one for the Food Science Club as it has been very successful in attracting a lot of interest from other students on campus as well as from the Madison community. Food Science Club took several initiatives to spread the awareness about the Food Science program. Some of the initiatives included targeting other student organizations such as the Chadbourne dorm and facilitating a science outreach program. The science outreach program was aimed at educating the elementary school students and their families about Food Science. Furthermore, food scientists from the industry were invited to club meetings to give talks so as to increase the awareness among students about opportunities for careers and internships. The companies included Kraft, Nestle, ADM Cocoa and Tate and Lyle, to name a few.

The club has had three product development teams participating in national level competitions like the Institute of Food Technologists (IFT) and the Almond Innovations product development contest. The IFT team was headed by Brad Bolling, while the Almond Innovations team was lead by Sivaraj Kaliappan. The Almond Innovations team was successful in making it to the final round of the competition. The product entered in the contest was a delicious and healthy bite-sized frozen snack that entwines low fat ice-cream, tasty almond cake, scrumptious chocolate, slivered almonds, and crispy almond wafer. A third team headed by Rachel Prosocki was successful in making fruit chips and herbal tea from fruits such as Aronia and Seaberry that are rich in anti-oxidants and nutrients. The college bowl team from the department, captained by Sofia Erazo-Castrejon made it to the final round of the Midwest Area competition. The UW-Madison team put up a tough fight against the Purdue team which won the Midwest championship.

This year's Food Science Club social events included many flavorful activities like ice cream social, pizza and beer tasting, thanksgiving dinner potluck and chocolate dipping social. The micro-chef competition in March witnessed two very talented teams concoct mouth-watering three course meals with cream cheese as the main ingredient. Micro-chefs had only microwave ovens to help them in this endeavor. A new activity that was added to the chart was the culinary program in which every month a food event was organized around themes such as "heart healthy." The culinary program is intended to educate students about easy preparation and stylized presentation of food. In April, we ended the year with a Cheese and Wine tasting event with the Alumni and Faculty.

*Chinthu Udayarajan*

### **Dairy Plant News**

Dairy Plant master cheese maker Gary Grossen submitted cheeses in three categories at the 2006 World Championship Cheese Contest held at the Monona Terrace Convention Center in Madison WI on March 21 – 23 this year. He received third place in the Hard Sheep's Milk Cheese category with a score of 98. His Gouda cheese was ranked eighth in the world, with a score of 98.4 surpassing no less than twelve Gouda cheeses from the Netherlands. In the Flavored Semi-soft Cheese category, Gary's Monterey Jack with Chives received a score of 98.85. An excellent showing for our first entry in the World Championship Cheese Contest. Congratulations Gary!

The past year has seen several staffing changes in the Dairy Plant. Gina Mode, quality assurance specialist for nine years, transferred to the Center for Dairy Research in the role of Senior Research Specialist. The new quality assurance specialist, Catherine Landers, started in the QA lab in September 2005. Cathy comes to us from the Center for Dairy Research. Pedro Cavalheiro and Greg Turner joined the crew in the Dairy Plant, and Ken Norton retired after more than 31 years in the dairy plant working as a cheese maker and pasteurizer operator.

If you should come to Madison, include a stop at Babcock Hall and the Dairy Store. German Chocolate Cake and Caramel Cappuccino are two new ice cream flavors. Or try some Dutch Käse, an aged Gouda style cheese developed at the Dairy Plant.

*Tom Blattner*

### **John Lucey Receives 2005 ADSA Award**

Associate professor John A. Lucey received the 2005 DSM Food Specialties Award from the American Dairy Science Association. Lucey was honored for his research results that provide fundamental advancements in our understanding of the molecular interactions in dairy foods that control product functionality.

John's research has been concerned with a) formation of milk protein-based gels b) physiochemical mechanisms controlling cheese texture and functionality and c) structure-function relationships in dairy foods. Lucey's research demonstrated the need to control somatic cell counts of cheese to avoid problems in cheese texture or yield. His group investigated coagulation properties of a plant rennet from *Cynara* flowers which may be useful for the industry. His research also demonstrated that residual milk salts in cheese were present in their original undissolved form and so are important in cheese texture and function.

Between 2000 and 2005, Professor Lucey was the author or co-author of 27 referred publications and 7 book chapters. He also gave 37 invited lectures at national and international symposia. Dr. Lucey joins six other UW-Madison food scientists who received either the DSM Food Specialties Award or its predecessor, the Pfizer Award. They are: Walter Price (1959), Norman Olson (1971), Elmer Marth (1975), Clyde Amundson (1987), Mark Johnson (1992), and James Steele (2000).

### Michael Pariza Named Highly Cited Researcher

ThomsonISI, formerly the Institute of Scientific Information, has designated Michael Pariza as a highly cited researcher, worldwide, in the agricultural sciences. ThomsonISI publishes various versions of *Current Contents* and for over 20 years has assembled names of all authors of references cited in all papers listed in *Current Contents* into an immense data base. Thus, ThomsonISI can readily determine the names of researchers whose papers are cited frequently by other researchers. Frequency of citation is a key measure of the influence of a researcher on science and technology. Citation data are a statistically powerful resource for finding individual scientists who have formed or changed the course of research on a subject. Fewer than .5% of all scientists qualify to be designated as highly cited researchers

Dr. Pariza, Distinguished Wisconsin Professor of food microbiology and toxicology, joined the Food Research Institute (FRI) in 1976 to develop a research program on relationships between food and cancer. He soon encountered the anticarcinogen conjugated linoleic acid (CLA) in some foods largely of animal origin. For more than 25 years, Pariza has studied the biological effects of CLA when ingested by humans and certain food animals. Thus he became the world's leading authority on this compound. Professor Pariza's work has prompted worldwide interest in and research on CLA. During his years at FRI, Dr. Pariza also studied dietary fat and cancer risk, soy sauce and cancer risk, and safety of the new food ingredients and functional foods. Pariza joins four other UW Madison food scientists who have been designated as highly cited researchers. They are: Elmer Marth (2002), Norman Olson (2002), Fun Sun Chu (2004), and Robert Lindsay (2004). For more information on highly cited researchers, visit [www.isihighlycited.com](http://www.isihighlycited.com), click on agricultural sciences, and when names of researchers appear, click on the name and in most instances biographical information will appear.

### Faculty/Staff Notes

**Michael Pariza** of the FRI composed the symphony *The Amazing Whimcyle* with four movements (Buckle Up, Critters in a Puddle, Riding an Ellipse, and SETI calling). The world premiere of the Pariza symphony occurred on December 4, 2005 when it was performed by the Moraine Symphonic Band on the campus of UW-Washington County in West Bend, WI....During 2005, **J. Russell (Rusty) Bishop** presented 41 invited talks to Wisconsin (10), United States (13), and International (18) audiences; he continues to serve as chairman of the U.S. National Committee to the International Dairy Federation (IDF) and as chairman of the IDF's Program Coordination Committee...**Robin Connelly** serves as an alternate member of the UW-Madison Faculty Senate...**Srinivasan Damodaran** is the co-editor, together with **Kirk Parkin** and **Owen Fennema**, of the 4<sup>th</sup> edition of "Food Chemistry," to be published in 2006 by CRC Press; he gave an invited lecture at the Pira International Conference on Biodegradable Hygiene Products held in Leatherhead, U.K, on December 13-14 2005 and also serves on the editorial board of *Food Biophysics*...**Mark Etzel** serves on the editorial board of *Journal of Food Engineering* and of *Journal of Food Process Engineering*. He presented seven invited lectures to various U.S. groups including 3M Corporate Research Laboratory, American Chemical Society annual meeting, Millipore Corporation, Fourth International Whey Conference and still others...**Richard Hartel** continues to prepare a monthly column on food science for the Madison *Capitol Times*. He presented an invited lecture on promoting student learning at Oregon State University. Other invited lectures were given at an IFT short course, annual meeting of the American Institute of Chemical Engineers, Standard Foods in Taipei, Taiwan, annual meeting of the American Oil Chemists Society and still others; he also serves on the editorial board of three scientific journals and does editorial work for five other organizations...

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...**Barbara Ingham** serves as faculty co-director of the UW-Madison Women in Science and Engineering Residential Learning Community; she also is on the steering committee of the Center to Integrate Research, Teaching and Learning...**Steven Ingham** serves as co-chairman of the Biology Major Executive Committee; Steve also serves as chairman of the College Honors and Undergraduate Research Committee and is a member of the College Academic Planning Council. Steve and his associates presented four papers at the International Congress of Meat Science and Technology...**Robert Lindsay** was a technical judge at the annual competition of the American Cheese Society in July, 2005 in Louisville, KY; he is on the editorial board of the *Journal of Food Composition and Analysis* and serves on the college committee for the Windor-Bascom Professorship...**John Lucey's** graduate student, Chinthu Udayarajan, received first place in the Dairy Foods Graduate Student paper competition at the 2005 annual meeting of the American Dairy Science Association; Lucey developed and presented a short course on yogurt in Queretaro, Mexico; John serves on the Journal Management Committee of the *Journal of Dairy Science* and on editorial boards of *Le Lait* and the *International Dairy Journal*...**John Norback** is on the College Facilities Committee and also is chairman of the Dairy Plant executive advisory committee and so has responsibility for academic staff employees...**Kirk Parkin** serves on the editorial board of three food-related journals and is an associate editor of the *Journal of Food Science*. His graduate student, B. Bolling, placed third in the Food Chemistry Poster competition at the 2005 IFT annual meeting and received the Student Excellence Award and Honored Student Award from the American Oil Chemists Society in 2005...**Scott Rankin** edits the newsletter of the IFT Dairy Division; he also was superintendent of dairy foods judging competition at the 2005 FFA State Career Development Event; Scott is scheduled for promotion to associate professor on July 1, 2006...**James Steele** is on the executive committee of the IFT Biotechnology Division; he also serves on the College Equity and Diversity Committee and the Honorary Recognition Committee; Jim gave invited lectures at the Royal Veterinary and Agricultural University, Frederiksberg, Denmark, at the University of Minnesota, at Cargill, and at Integrated Genomics...**William Wendorff** was a dairy products judge at the American Cheese Society Conference and the World Dairy Expo Contest; he was a processed meats judge at the Wisconsin State Meat Convention; Bill continues to serve on two technical advisory committees (chlorides, phosphorous) of the Wisconsin Department of Natural Resources...**Thomas Blattner** is a councilor for the Wisconsin Section of the IFT; he is a member of the College Committee on Academic Staff Issues and is chairman of the Academic Staff Awards and Subcommittee...**Yvonne Bushland** is a member of the College Dietetic Programs Committee; she also is a member of the UW-Madison Academic Staff Assembly and the Biological and Medical Science Academic Staff Review Committee...**Monica Theis** is the food safety editor of the *Consultant Dietitian*, a quarterly publication of the American Dietetics Association; she gave invited lectures to the Dietary Managers Association and the Healthy Kids Coalition (WI Department of Public Instruction); Monica is a member of college committees on Instruction Improvement, on Assessment, and on Leadership...**Daryl Lund** currently is executive director of the North Central Regional Association of State Agriculture Experimental Station Directors; he plans to retire at the end of 2006 and then become a part-time consultant to the aforementioned association with an office in Babcock Hall; Daryl has been appointed to the National Agricultural Research Extension, Education, and Economics Board of the U.S. Department of Agriculture...**Mark Johnson** of the CDR was a judge at the 2006 World Championship Cheese Contest held in Madison in March; a major article about Mark and his career appeared in March, 2006 in Wisconsin Week...**Jae Hyuk Yu**, at FRI, will be promoted to associate professor effective July 1, 2006.

### Elmer H. Marth, 1927-2006

Emeritus Professor Elmer H. Marth, age 78, died on June 19, 2006 at University Hospital in Madison of leukemia. He was born on a dairy farm near Jackson, WI on September 11, 1927, and earned his B.S. (1950), M.S. (1952), and Ph. D. (1954) degrees at the University of Wisconsin-Madison, all in bacteriology with an emphasis on food/dairy bacteriology. Dr. W.C. Frazier served as his major professor for both graduate degrees. Dr. Marth was appointed as a project associate (1954-1955) and then instructor (1955-1957) in bacteriology.

On August 10, 1957, at Calvary Lutheran Chapel in Madison, he married Phyllis E. Menge, a medical technician and native of Fall Creek WI. A few weeks later, the newlyweds moved to Deerfield, IL since Elmer had accepted a position with the Research and Development Division of Kraft Foods in nearby Glenview, IL. Elmer rose through the ranks at Kraft Foods and in 1966 was named associate manager of the Microbiology Laboratory. It was also in 1966 that Elmer left Kraft Foods and returned to UW-Madison as associate professor of food science with joint appointments in bacteriology and food microbiology and toxicology (Food Research Institute).

At UW-Madison, Dr. Marth was promoted to professor in 1971 and upon retirement in 1990, he was named emeritus professor. Marth taught courses in food sanitation, food fermentations, farm bacteriology, and writing of scientific reports. He also regularly gave guest lectures in eight other courses.

Dr. Marth organized and maintained a major research program in food microbiology, including studies on food spoilage, food fermentations, and foodborne diseases. Foodborne pathogens that were studied include *Staphylococcus aureus*, *Salmonella*, enteropathogenic *Escherichia coli*, and *Listeria monocytogenes*. Dr. Marth and his students were the first investigators, world-wide, to publish a series of papers on behavior of *Listeria monocytogenes* during manufacture and subsequent storage of an array of dairy foods, including several varieties of cheese. Dr. Marth was the major professor for 32 students who received the M.S. degree and also for 32 students who earned the Ph. D. degree. Marth also supervised 17 post-doctoral researchers who worked in his laboratory for periods ranging from 3 months to several years.

During his career, Marth was the author, co-author, editor or co-editor of over 660 scientific publications, including research papers, review papers, books, chapters in books, patents, and abstracts of paper given at meetings of professional organizations. He also served as editor of the *Journal of Food Protection* from 1967 to 1987. Although he was pleased with all his publications, he was particularly pleased with the book, "Milk, Microbes and Marth: An Autobiography," published in 2001.

The excellence of Dr. Marth's research and teaching was recognized by his peers in professional and industrial organizations. He was honored by many organizations during his lifetime a few of which include the ADSA (Pfizer, Dairy Research Foundation, Borden, and Kraft Teaching awards; also named Fellow), IAFP (Educator, Citation, Honorary Life Member, Excellence as Journal Editor, and NFPA Food Safety awards; also named Fellow) and IFT (Nicholas Appert and Babcock-Hart awards; also named Fellow), Amer. Cultured Dairy Products Assoc. (Nordica), and the National Cheese Institute (Laureate).

Dr. Marth was preceded in death by his parents, an infant brother, and an infant son. He is survived by his wife, Phyllis. Dr. Marth organized and composed the departmental alumni newsletter from the mid-1980s until the months preceding his death.

### **Hiroshi Sugiyama ("Sugi"), 1916-2005**

Professor Hiroshi Sugiyama died on Sunday, September 4, 2005. He was known as "Sugi" to many friends and colleagues. Sugi was born in 1916 in Alameda, California, earning his A.B. in Bacteriology from the University of California-Berkeley in 1939. After working as a County Microbiologist in San Luis Obispo and serving in the Army, he attended the University of Chicago and obtained his Ph.D. in Bacteriology in 1950.

Sugi worked as an instructor at the Food Research Institute at the University of Chicago beginning in 1951 and advanced to Associate Professor in 1961. During this time he primarily worked on the microbiology of staphylococcal enterotoxins. He came to Wisconsin when the Food Research Institute moved here in 1966. From 1966 until his retirement, he worked primarily on *Clostridium botulinum* and its neurotoxins.

Sugi was a pioneer in botulinum neurotoxin research, including purification and biochemistry, and dichain nature and activation. He was among the first investigators to show that some strains of *C. botulinum* produce more than one serotype of neurotoxin, and he characterized botulinal-like neurotoxins from *Clostridium baratii* and *Clostridium butyricum*. He also developed animal models to study intestinal botulism. Sugi developed many practical procedures that have helped investigators in the botulism field, including effective methods for purification and assay of botulinum neurotoxins and methods to raise high quality antibodies to the toxins in animals.

He had many interests outside of the laboratory. He liked to vacation in the Rocky Mountains, spending time camping and fishing. He also enjoyed classical music and reading. Often he invited students to accompany him for a day or so on his trips.

He is survived by his wife, Yuri, and his two daughters Linda and Gayle.

*Eric Johnson*

### Food Science Students Receive Honors

**Rachel Prososki**, graduate student of Dr. Scott Rankin, was awarded the IFTSA-Campbell Excellence in Leadership Award by the Institute of Food Technologists Student Association. This award is presented to one graduate student and one undergraduate student member of IFT each year. Rachel will be receiving the award at the annual IFT meeting in Orlando, FL.

Rachel is the leader of one of the Department's three Product Development Teams, and has served on the Team since her undergraduate career. This year, Rachel served as the National IFT Product Development Competition Chair, a duty which oversees all details of the National Product Development Competition at the annual IFT meeting.

The **Food Science Product Development Team** once again placed second in the Burrill Business Competition at UW-Madison. This competition is held to encourage collaboration between cross-disciplines, and team entrants must be comprised of students with science or engineering qualifications as well as business/social science expertise. Each team evaluates the market potential of the technology-based product or service, and develops the proposed technology as well as a comprehensive business plan.

The Food Science/Business School team took second place in the competition with a business plan for Healthy sTarts, a granola/yogurt snack product, which was the winner of the 2004 IFTSA Product Development Competition at the annual IFT Meeting. The winning team included Food Science students James Jordan (team captain), Sivaraj Kaliappan, Peter Weber, Brad Bolling, and Kristen Blachek; Biological Systems Engineering student JinJin Zhou, and School of Business students Tom Godfrey and Peter Berman.

### News from Former Students and Researchers

Effective January 1, 2006, **Elliot Ryser**, associate professor of Food Microbiology at Michigan State University became the fourth scientific editor of the *Journal of Food Protection*; the other three editors include **Joseph Frank**, professor of food microbiology at the University of Georgia-Athens...**Robert Brackett**, director of the Center for Food Safety and Applied Nutrition, FDA; **Joseph Frank**; and **Susan Sumner**, Professor and Head Department of Food Science and Technology, Virginia Tech, became Fellows of the International Association for Food Protection at its 2005 annual meeting in Baltimore, MD...**Fathy El-Gazzar**, professor of dairy microbiology at the University of Assiut in Egypt, is doing research on probiotic bacteria and on low-salt and low-fat Egyptian cheeses; he published a book entitled "*The Art of Writing Scientific Research*"...**Noraini Khalid** and **Normah Ahamad** are in the same department at the Malaysian Agricultural Research and Development Institute in Kuala Lumpur; in addition to doing research, Noraini does research management and participates in deliberations of Codex Alimentarius, which brings her to the U.S. for meetings every two years...**Theodore Minor** is retired but is involved with Habitat for Humanity and continues to travel—in 2005 he and his wife visited Hungary, Croatia, Serbia, Bulgaria, and Romania...**Michael Doyle**, regents professor of food microbiology and director of the Center for Food Safety at the University of Georgia-Griffin appeared on the "Good Morning America" show and attended meetings in the Cotswold area of England and in Aberdeen, Scotland...**Jonathan Frey** is still at Taco Bell where he develops new products—one such product is "Crunch Wrap," a tostada inside of a burrito; he enjoys riding his motorcycle from Redondo Beach to Malibu, CA...**Elliot Ryser** and **Elmer Marth** are co-editors of the 3<sup>rd</sup> Edition of "*Listeria, Listeriosis and Food Safety*," which is to be published in 2006 by CRC Press; contributors of chapters in the book include **Ahmed Yousef**, professor of food microbiology at Ohio State University; **Byron Brehm-Stecher**, assistant professor of food safety and microbiology at Iowa State University; **Elliot Ryser**; **Robert Brackett**; and **Jeffrey Kornacki**, president of Kornacki Food Safety Associates, Macfarland WI... **Margaret Halpin Dohnalek**, director of strategic business development for Abbott Nutrition International (ANI), is now in charge of the entire strategic research program of the ANI...**Dana Wiseman** completed work for the M. Ed. in science education and now is teaching chemistry and technical chemistry at the Herndon High School in Herndon, VA...**Ahmed Yousef** is the co-editor of "*Microbiology of Fruits and Vegetables*" published recently by CRC Press...**Jane Mueller Reise** is with International Dioxide, Inc., a DuPont Company, in North Kingston, RI; she is doing microbiology quality control and regulatory work...**Mary Mulry** is director of product development for healthy living and central market brands, H.E. Butt Grocery Co., San Antonio, TX...**Kimberly Badtke** has relocated to Ohio and works for Vreba-Hoff Dairy Development, a family-owned company that assists dairy farmers in relocating from Europe and Canada and establishing state-of-the-art dairy farms in the Midwest...

*Continued on page 10*

...**Jennifer Vincent** is with the research and development department of Kraft Foods-Oscar Mayer in Madison; recently she was elected President of the Wisconsin Agricultural and Life Sciences Alumni Association...**F. Xavier Malcata** is professor of food science and engineering at the Portuguese Catholic University in Porto, Portugal; for seven years he also has been dean of the College of Biotechnology...**Sara Hale Henry** is a senior toxicologist/risk assessor at the Center for Food Safety and Applied Nutrition, FDA; she recently completed an international risk assessment, sponsored by WHO, on acrylamide in foods moving in world trade, and also is working on a book describing ways to prevent mycotoxin contamination of foods and improve public health in developing countries. . . **Laura (Lederman) Rothman** is now teaching integrated science at Cedarburg High School in Cedarburg, WI...**Tom Vergeront** is a Top Financial Advisor for Smith Barney in Rhinelander, WI; his practice centers on the Food Science and Food Industry ... **Chanokphat Phadungath** has joined Dr. Lloyd Metzger's lab to pursue a Ph.D. degree in the Department of Food Science and Nutrition at the University of Minnesota-Twin Cities.

**Richard S. Paape** received the B.S. degree in food science from UW-Madison in 1979. On May 18<sup>th</sup>, 2005 he was involved in an automobile accident and died on July 7, 2005.

**Earl O. Wright**, 88, of Hubbard Iowa, and formerly of Bella Vista, Arkansas, died on December 10, 2005 at the Hubbard Care Center. Earl was born on July 2, 1917 in Bloomington, WI. He received the B.S. degree from UW-Platteville and the M.S. in dairy and food industries at UW-Madison. After briefly serving as a dairy extension specialist, Earl left Madison and moved to Ames, Iowa, where he joined the faculty of Iowa State University, again working as a dairy extension specialist. He retired in 1979. Earl also served as executive secretary of the International Association of Milk, Food, and Environmental Sanitarians (now International Association of Food Protection) from 1974-1983.

**Robert B. Rennebohm**, age 83, died in Madison on April 15, 2006. He was born in La Crosse on February 20, 1923. Bob earned the B.S. degree in dairy industry in 1948. In 1948 he and Jean Swartz of La Crosse were married. For 33 years he was president of the UW-Foundation, retiring in 1993. He lettered in football, was drafted by the Green Bay Packers in 1947 and was inducted into the UW Athletic Hall of Fame in 2004. He is survived by his wife, a son, two daughters and nine grandchildren. A memorial service was held on April 18<sup>th</sup>, 2006 at Luther Memorial Church in Madison.

### News from the CDR

Rusty Bishop, director of the Wisconsin Center for Dairy Research and chair of US/IDF National Committee presided as co-host for the World Dairy Summit 2005 (WDS-2005). The WDS 2005 was held in Vancouver from 17 to 22 of September 2005 at the Sheraton Wall Centre Vancouver under the Theme: "Partnering—the Future of the World Dairy Industry."

The World Dairy Summit 2005 (WDS-2005) was co-organized and hosted by two important International Dairy Federation National Committees; FIL-IDF Canada and the US National Committee of IDF (US-IDF). This was a first in the history of the International Dairy Federation (FIL-IDF). The WDS 2005 was a great success and brought high visibility for the work of IDF in North America.

Mark E. Johnson was selected as a judge for the 2006 World Cheese Contest. Judging occurred at the Monona Terrace, March 21-23, 2006.

CDR Whey Separations Technologist Karen Smith presented "Ultrafiltered milk and ultrafiltered milk ingredients: What's in store for the future?" at the annual IFT meeting. New Orleans, LA was the site of the annual IFT meeting, July 16 to 20.

You may have visited with CDR folks at the Dairy Management Inc. IFT booth, where Kathy Nelson and Dean Sommer served high protein cheese crackers and KJ Burrington provided samples of a high protein beverage, a mango flavored isotonic protein beverage.

CDR presented findings of work recently completed at the Center during the 2005 ADSA annual meeting in Cincinnati, Ohio, July 24 to 28, 2005. Kyungwha (Kate) Lim, CDR sensory coordinator presented "The effect of cheese temperature on the texture and shredding of mozzarella." Rani Govindasamy-Lucey, CDR scientist, presented "Use of Cold Microfiltration Retentates for Standardization of Milks for Pizza Cheese: Impact on Yield and Functionality."

Marianne Smukowski is the current president of the Wisconsin Association of Food Protection and Kristen Houck serves on the board of the Wisconsin Laboratory Association.

Cheese Industry and Applications coordinator John Jaeggi welcomes several new staff to the team. "New" staff includes Gina Mode, Bilal Dosti, Joe Jaeggi and Dave Schroeder. Juan Romero, coordinator of analytical services also welcomes Carrie Saynisch and Kit-Yin Ling to the analytical team

*Mary Thompson*

### News from the Food Research Institute

**Meetings: Focus on Food Safety Meetings.** Starting in 2005, FRI changed its schedule of one annual Spring meeting that covered a variety of topics related to food safety to the organization of several meetings each year on specific topics. The first meeting in April 2005 considered topics related to "Development and Production of Safe Process Cheese Formulations" and the second meeting in September presented current information on "Strategies to Enhance Food Safety Using Antimicrobials and Sanitizers."

The next meeting, June 7-8, 2006, will address "Nanotechnology Applications in Food, Food Processing, and Food Packaging Developments." More details are available at our website.

**FRESH Seminars.** FRESH (Food Research and Education Seminar Highlights) seminar series was started in 2005 and presents timely information on Food Microbiology and Safety on Wednesday of every other week at 11:30 am. Please see our website for topics and join us!

FRI Acrylamide Consortium met several times in the past year with researchers in several departments on campus sharing information on: mechanisms of acrylamide degradation, the effects of potato variety, growth conditions, and storage on asparagines levels, and intervention strategies to reduce acrylamide levels in baked and fried foods. The initial 3-year funding period has been completed and comprehensive index was prepared to cover the many topics discussed during this period. Focused research continues in several laboratories.

A third annual Symposium on Regulatory and Analytical Challenges for Food and Dietary Supplements was held in August in cooperation with Covance Laboratories. Analytical challenges encountered in quantifying many antioxidants present in foods, efficient design of analytical facilities (including the Six Sigma program), good manufacturing practices, and regulatory and international trade issues, including the role of Codex were discussed.

**Research.** Our mainstay research focuses on important foodborne bacterial pathogens, including *Clostridium botulinum* and *E coli* 0157:H7, biofilm formation, mycotoxins, the anticarcinogen conjugated linoleic acid, foodborne allergens, and most recently, acrylamide formation in foods. Updated reviews of literature on process cheese safety and antimicrobials, cleaners, and sanitizers used in the food industry have been prepared and are available on our website. (<http://www.wisc.edu/fri/>)

**In Memoriam.** FRI was deeply saddened by the deaths of two of our early researchers on foodborne toxins. Edward J Schantz who worked on purification and characterization of toxins from *C. botulinum*, *S. aureus*, *B. cereus*, and shellfish passed away in April 2005. Hiroshi Sugiyama, who developed assays, animal models, and methods for purification of botulinum toxin, passed away in September 2005. Much of the subsequent research on these toxins is based on knowledge and techniques developed by these pioneers.

**Awards.** Jae Hyuk Yu was promoted to Associate Professor. Amy Wong was named an Alternate Councilor on the American Society for Microbiology Board of Directors. Nancy Keller was elected a Fellow in the American Association for the Advancement of Science.

*Ellin Doyle*

# Food Science Education Investment Initiative: Creating the Future

I/we wish to join other students, alumni, industry and friends in enhancing the teaching, research, and outreach programs in the Department of Food Science by contributing as indicated below to the Food Science Educational Investment Initiative campaign.

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Please make your gift payable to **UW-Foundation-Food Science Campaign**, University of Wisconsin Foundation, 1848 University Avenue, PO Box 8860, Madison, WI 53708-8860. The University of Wisconsin Foundation is an independent non-profit, tax-exempt corporation that raises, invests and distributes funds for the benefit of the University of Wisconsin-Madison. Your gift, whatever size, is needed and appreciated by the University. For those contributors whose level of support represents a special commitment to excellence at UW-Madison, the Foundation provides recognition through annual giving honor clubs. For exceptional support, the UW Foundation invites donors to membership in The Bascom Hill Society. For more information about giving opportunities, contact Jodi Wickham, director of development for the College of Agricultural and Life Sciences, 608-263-2027. **Please send me information about the following:**

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We would like to hear from you. This information not only allows us to update our files but also provides us with news to pass on to your classmates and friends. Please remember if you relocate in the future to send us your new address. Also, if there are changes or mistakes in your address as we now have it, please notify us.

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