

UW - M a d i s o n
**FOOD SCIENCE
NEWSLETTER**
June 2005



I n t r o d u c t i o n

Hello again! Once more we greet you from Babcock Hall and the Department of Food Science. If you were on campus, you would see all sorts of changes: (a) a new gas-fired electricity generating plant is nearly complete and is located on the west end of campus, (b) new greenhouses have been built north of the electricity generating plant, (c) the former Bacteriology Building (E.B. Fred Hall) has been demolished and replaced with a large hole in the ground in preparation for construction of the new Microbial Sciences Building, and (d) road construction at various campus locations.

Some changes that are not visible include: (a) retirement of CALS Dean Elton Aberle at the end of August 2005 – a search committee is looking for a replacement; (b) because of budget difficulties faculty who retire or leave are not being replaced – thus the number of faculty in Food Science is down to 13 and in the Food Research Institute it is down to 5; and (c) fewer faculty mean fewer grants and less money for research in the department – this translates into fewer graduate students being trained – currently there are 42 in Food Science, whereas not too many years ago the number was close to 100.

In spite of the difficulties, life goes on in Food Science and we have attempted to describe some of what happened in the last year in this newsletter. We again have included a questionnaire at the end of the newsletter. We urge you to complete this form and return it so we can use the information in a future newsletter.

This newsletter was organized and edited by Elmer H. Marth, with some help from Yvonne Bushland. The manuscript was prepared by Molly Fischer Bjork. Publication and distribution of the newsletter was supported, in part, by the Wisconsin Agricultural and Life Sciences Alumni Association (WALSAA).

M e s s a g e f r o m t h e C h a i r m a n

Greetings from the Department of Food Science at the University of Wisconsin-Madison. We are moving into the last year of our 5-year transition plan, “Design for the Future”. With state budget cuts, we have had some real challenges over the past 4 years and will continue to struggle in the next biennium. After the last two years of an 8.24% budget cut, we are facing an additional 3.31% cut for the next two years. This will result in loss of another 0.5 FTE in our support staff. We will again have some restructuring of our office staff to address this cut but should be able to provide the necessary support for our critical instructional program.

As we indicated in our December 2004 newsletter, we have seen an increase in undergraduate enrollment of up to 71 students. This year we had 17 seniors graduating so we will have a challenge to keep our numbers up for next year. The enrollment in the dietetics program is constantly growing and is approaching 200 students. This is putting a greater demand on our staff that is teaching several food science courses in that program. With our consolidated laboratories in the Human Ecology building (formerly the Home Economics Building), facilities are currently a bigger problem than staff. We now are in the early planning stages for transitioning those food application teaching labs into Babcock Hall. Babcock Phase II remodeling project is currently scheduled for the '07-'09 state budget but the teaching labs are tentatively scheduled for the summer of 2007. We are hoping for an improvement in the economy so we can eventually get Phase II completed and get our teaching labs up to date with facilities and equipment.

As we move forward with this last year of our transitional plan, we are continuing the review of our undergraduate curriculum. We have discussed this at our annual faculty/staff retreat and more information on that review is included in the newsletter. We are also including a further update on our “Create the Future” Campaign Drive. A more extensive coverage of this campaign will be forthcoming in the December newsletter.

We continue to have outstanding performances by both students and faculty. The product development team won the Grand Prize in the Almond Innovation Contest for the second year in row. They have also qualified for the final 2005 Product Development Contest at the IFT Annual Meeting in New Orleans in July.

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We certainly want to thank Dr. Elmer Marth, Emeritus Professor, for his outstanding commitment as Editor of the Food Science Newsletter. He always does a great job of pulling all the information together on students, staff, faculty and alumni. We also want to thank Molly Fischer Bjork, our Departmental Administrator, for her efforts of putting everything together in the published newsletter form.

This May, Babcock Ice Cream was named as one of the top 10 foods characterizing Madison so we carry on the strong tradition. We appreciate your continued support of the department and look forward to visiting with you in the near future. On Wisconsin!

William L. Wendorff

Overview of Departmental Research

Research is a major professional activity of most professors in the Food Science Department. It is done either to solve industry problems or to better understand the nature of the foods we consume. This issue of the Newsletter also includes research done in the Center for Dairy Research since the work is done in Babcock Hall often with help from Food Science faculty. As might be expected, major research emphasis is on dairy products and processing with cheese and its byproduct, whey, leading the list. The following paragraphs give an overview of current active research in the Food Science Department and in the Center for Dairy Research.

Cheese flavor/ripening

(a) Mechanisms for intensifying and modulating cheese flavor: a global approach; (b) production of intensely flavored cheddar-type cheese by adjunct cultures; (c) development of parmesan cheese flavor using selected bacteria; (d) identifying genes involved in cheese flavor development; (e) investigating the role of specific enzymes in the generation of cheese flavor; (f) defining the role of grazing on the flavor of cheese; (g) systematic identification of enzymes and metabolic pathways used by *Lactobacillus casei* to intensify and modulate cheese flavor; and (h) identifying energy sources used for growth of non-starter lactic acid bacteria in ripening cheese.

Cheese manufacture/processing

(a) Cheese structure/function manipulation to improve shreddability; (b) identification of physical/chemical changes in shredded cheese over time; (c) develop nonfat mozzarella for use in the school lunch program; (d) understanding and controlling the calcium equilibrium in cheese; (e) relating rheological properties to cheese functional performance; (f) develop a process for adhering meat products (pepperoni) to cheese for one-step pizza topping application; (g) a chemistry-based approach to understanding process cheese functionality; (h) feasibility study for development of shelf-stable cheese; (i) understanding structure/function relationship in cream cheese responsible for its performance; (j) develop innovative solutions for the “cold melt” of cheese when partnered with another food ingredient (i.e. meat); (k) cheese serum component’s role in inhibition of calcium lactate crystallization; (l) microstructure and functionality of processed cheese: the role of milk fat; (m) applications of membrane processing for cheese manufacture; (n) cheese functionality; and (o) design of low-fat processed cheese suitable for baking applications.

Whey

(a) Developing pH-sensitive biodegradable smart hydrogels using whey protein concentrate; (b) control of annatto cheese colors in whey products; (c) improving lactose refining technology by controlling crystallization; (d) characterization of pigments and conditions responsible for browning in whey powders; (e) nutraceutical protein recovery from acid whey; (f) phase/state transitions that affect drying of whey products; (g) improving WPI functionality for beverage applications; (h) increasing the whiteness of sweet whey powder; (i) investigating the chemical basis for browning in dried whey products; (j) development of process technology to recover value-added components from salty whey; (k) production of sialyllactose from lactose using a bioreactor; and (l) production of whey protein concentrate 80 with a clear, tasteless, consistent flavor.

Other dairy research

(a) Review and comparison of nutritional and functional properties of dairy proteins relative to other market protein sources; (b) identification and control of off-flavors in commercially produced GMP products; (c) manufacture of a no-sugar frozen dessert; (d) analytical survey of the composition of milk protein concentrates available on the United States market; (e) effect of heat treatment of milk on activation of *Bacillus* spores; (f) understanding the structure-function relationships that control rheological and sensory properties of stirred-type yogurt; and (g) technical and economic development of a milk refinery.

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Food safety

(a) Effects of cheese solids on *Clostridium botulinum* in process cheese products; (b) development of predictive models of use in validating meat and poultry HACCP plan critical limits; (c) methods for suppression of acrylamide in foods; and (d) food safety education for high-risk, hard-to-reach audiences.

Nutraceuticals

(a) Nutraceutical lipids from dairy products; (b) identifying cancer chemopreventive agents in soybeans; (c) selenium-enriched vegetables as dietary vehicles for delivering cancer chemoprotective benefits; (d) identifying potentially anticarcinogenic components in common vegetables; (e) identifying potentially cancer chemopreventive agents in maize; (f) antioxidant and phase II enzyme inducing activities of betalains; (g) screening for cyclooxygenase-2 inhibitors from fruits and vegetables; and (h) chemistry of ginkgolide stability in foods and supplements.

Other research

(a) Numerical simulation and validation of crystallization processes; (b) ice crystallization in a scraped surface heat exchanger; (c) investigation of the effect of mixing intensity on dough development and rheological property measurement, (d) mixing and simulation research; (e) micro-spectroscopic study of moisture mobility in amorphous saccharide materials; (f) structure-functionality of water-in-oil emulsion products; (g) virtual food processing field trips; and (h) novel food ingredients from food protein-polysaccharide complexes.

Anyone interested in information about any of the projects mentioned in the preceding paragraphs should contact the Food Science Departmental Office (608 – 262 – 3046) and then will be directed to the person doing the work.

Elmer H. Marth

Update on the Undergraduate Curriculum: A Report from the Curriculum Committee

In June of 2004, the department held 1.5-day retreat focusing on the undergraduate curriculum. At that time, faculty and instructional staff affirmed the following: continued emphasis on critical and integrative problem-solving, maintaining and increasing program rigor, and a commitment to teaching of core disciplines. Faculty and staff indicated a desire to increase flexibility in core offerings, to increase emphasis on food and health as a content area, and to add opportunities for research and practical training within the undergraduate curriculum. The Curriculum Committee was charged with a thorough review of the existing undergraduate curriculum as a basis for evaluating change.

Through a series of committee meetings, open ‘town hall’ meetings, and working groups over the past year, the Curriculum Committee has engaged faculty and instructional staff in reviewing the undergraduate curriculum and envisioning change. The industry advisory group, the Babcock Associates, also provided input into the process.

A day-long retreat was held on June 3, 2005 to develop a framework for a revised undergraduate curriculum. At that time, the department unanimously agreed to the following program direction:

- 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 process engineering; food analysis and food law; and culminating with senior-level integrated courses that build on core and foundation knowledge. To this end, learning outcomes are being developed for department courses. These learning outcomes will guide changes within the department courses and ensure that various stages of learning are addressed so that greater levels of understanding are achieved. For example, students will initially be challenged to know and understand basic concepts and, as their understanding matures, they will acquire an ability to apply, analyze, synthesize and evaluate these same concepts in the context of integrated problems.
- A sophomore-level gateway course will be 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.
- The senior capstone experience will be broadened to include an option for a senior thesis or other relevant experience to serve as the culminating project/experience.

If you would like to learn more, or to provide input into this process, please feel free to contact the following key individuals: (a) Rich Hartel – development of *Discovering Food Science*; (b) Jim Steele – development of gateway course; or (c) John Lucey – development of integrated junior/senior level courses.

Barbara Ingham

New Course Offering: Kosher and Halal Food Regulations

Visiting professor Joe Regenstein from Cornell University will be offering a 2 credit distance learning course on Kosher and Halal Food Regulations through the UW – Madison timetable (<http://registrar.wisc.edu/timetable/>; Food Science 375, section 2, or Judaic Studies 490, section 2). The course will also be available for off-campus learners through the UW Madison, Division of Continuing Studies (www.dcs.wisc.edu).

Anyone wishing to take the course who is not a student at UW needs to first register as a student through the Division of Continuing Studies. He/she can then take the course for either 2 or 3 credits. (Additional work will be required for the 3 credit version. We recommend the 2 credit version for off-campus enrollees (less expensive).) The University of Wisconsin- Madison Registrar's Office is then able to issue an official transcript for the course so that students may present the transcript for credit to their own campus. (Please check the acceptability ahead of time.)

Students taking the course through distance learning will participate along with the students on campus, who will be taking the course the same way. The course will mainly be done using Learn@UW and is based on lectures that are audio synchronized with PowerPoint. The PowerPoint slides are also available so students may download these before listening to the lecture. All submissions will be done electronically (email) and quizzes will be taken on Learn@UW. Other resources for the course are also provided on the Learn@UW site. This course will cover kosher, halal, and ethnic food laws, markets, and demographics of relevant groups. For more information contact Professor Regenstein at jmr9@cornell.edu.

UW-Madison Food Science Extension and Outreach

Aside from providing nationally-recognized short courses on a variety of food processing topics, UW-Madison Food Science has recently expanded its web presence. In collaboration with industry, regulatory agencies and other campus colleagues, several web-based services are now available at the following sites: 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 food 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 43rd version of the Resident Course in Confectionery Technology, co-sponsored by the National Confectioner's Association. Dates are June 12-24, 2005.

This past year, **Bill Wendorff** had nearly 300 students from the dairy industry attend the short courses that he coordinated. We are finishing up the 11th year of the Wisconsin Master Cheese Makers program in which over 40 cheesemakers have completed their advanced training for their Master Cheese Maker certificate. Bill continues to work with the state and national dairy sheep industry in development of potential markets for sheep milk products.

Steve Ingham has focused his extension efforts on providing scientifically validated critical limits for use by meat and poultry processors in their HACCP plans. His group is developing a user-friendly predictive model for processors to access on-line and evaluate the microbial safety of various processing steps. Steve continues to deliver HACCP training for meat, poultry, fish, and juice processors, and to coordinate the Better Process Control School. He is looking forward to a fall 2005 sabbatical leave.

Scott Rankin coordinates programming for four events (three offered biannually) including the milk pasteurization course, the premium ice cream course, the cheese grading and evaluation course, and the annual meeting of the Wisconsin dairy field representatives. Over 300 professionals attended these program 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

Food Engineering in Focus

Mixing it up with Strikes and Spares

Undergraduate and graduate students got to see a new side of some faculty members and also got to know those at different points in the program at the Food and Bioprocess Engineering Program (FBEP) Fall 2004 Mixer on November 11, which was funded in part by General Mills. Six undergraduate students, 7 graduate students and 4 faculty members had a great time getting to know each other better while bowling and eating pizza. Professor Gunasekaran (Biological Systems Engineering) showed that professors really do know how to have fun with his great enthusiasm for bowling—in spite of his score.

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Scaling Up “There and Back Again”

On April 29, 2005 a group of 3 undergraduate and 10 graduate Food and Bioprocess Engineering students took a trip “there and back again” to Minneapolis, MN to visit Crown Ironworks (the world leader in design and building of oil extraction facilities) and the General Mills Riverside location. Before touring the Crown Iron Works facility, Chas Teeter gave us some history of the company, which was a major ship builder in WWII, as well as an explanation of how oil is extracted from oil seeds and other oil-containing materials. The highlight of our visit to Crown was seeing the scale-up units in its pilot plant from a miniature table top unit to one that was two stories high. State of the art safety features in its facility also helped the students appreciate that the facility around the processes we work with must also be considered in process design. The General Mills visit, which was organized by alumnus Dennis Lonergan, began with an excellent presentation entitled “Process Development Best Practices” by Mark Boyd, where students were able to get a better appreciation of how what they are learning fits into process development, as well as what other skills they will need to draw on as they work in multidisciplinary teams. Then we were given a tour of the Riverside facility that emphasized the compartmentalized structure typical of a large operation such as General Mills, which was a contrast in scale to the structure of the much smaller operation at Crown they had seen earlier in the day where every employee did multiple tasks. The visit culminated with a talk about Food Rheology by Sumana Chakrabarti in the New Technology Unit, before the whole group headed “back again” to Madison.

If you would like to get involved in the FBEP activities for the Food Engineering students to get to know our students and to help us increase the size and strength of our student pool, please contact Robin Connelly at rkconnelly@wisc.edu.

Robin Connelly

Food Science Club News

The Food Science Club published a newsletter at the end of spring semester 2005. What follows is based on that newsletter.

Product Development Team

This year’s product development team again won the Almond Innovation contest with a product named cone-coxions. Cone-coxions are bite-sized crispy almond waffle cones layered with dark chocolate and drizzled with crunchy almond pieces. The team will be presenting its product at the upcoming IFT meeting in New Orleans.

The team also developed Healthy sTart which made it to the IFTSA finals in New Orleans. This product is a hand-held crunchy granola bowl made from a blend of grains and filled with a light yogurt spread and topped with blueberries and strawberries.

Members of the team include Rachel Prosocki, Kristen Blaschek, Sivaraj Kaliappan, Jamie Jordan, Brad Bolling, Leah Anderson, Peter Weber, Devi Wijaya, Dawn Preston, Corinne Otte, Carla Ryadi and Laura Folts.



College Bowl

Babcock Hall was the scene of the 2005 regional competition held on April 5 and 6. Teams competing were from UW-Madison, UW-River Falls, Michigan State University, Purdue University, and the Ohio State University. After fierce competition, the team from Ohio State University won the regional contest. The UW-Madison team royally entertained visitors Friday night, Saturday morning and Saturday night. Included were a tail-gate party, banquet at Babcock Hall, tour of the Madison bar scene, tour of the dairy plant and dinner at Union South.

Social events

The February Club meeting included the annual chocolate dipping event. Students, faculty, and guests dipped Oreos, wafers, potato chips and fresh fruit into molten chocolate. With the aid of appropriate molds, attendees also made chocolate bunnies, cows, and Bucky Badgers.

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In March, the club organized its first annual Iron-Chef competition. Two teams competed against each other to display their culinary skills in preparing an appetizer, main entrée and dessert in a limited time. Judges for the event were Beth Button and Drs. Jim Steele, Doug Hyslop, and Bill Wendorff.

The April meeting included the annual wine and cheese social. Students and faculty had the opportunity to taste wines from around the world and enjoy a wide variety of fruits and cheese including Havarti Dill, Muenster, and Colby that came from the dairy plant. In addition, the club presented Molly Fischer Bjork the award for Outstanding Faculty/Staff Member of the Year.

CALS Day for Kids

On April 26, 2005, Food Science Club members participated in the annual CALS Day for Kids event. Nearly 750 Madison-area fourth graders came to the Stock Pavilion to view various exhibits. The focus of the club's booth was leavening agents and how they make some baked goods rise. The children enjoyed learning about carbon dioxide by sealing bottles containing baking soda and vinegar and using the built-up pressure to shoot corks across the Stock Pavilion.

Elmer H. Marth

Dairy Plant News

Master cheese maker Walt Brandli retired in September. Walt joined Babcock Hall Dairy in 1992 and over the next twelve years he made a variety of cheeses including Juustoleipa cheese, a traditional cheese of Finland. In January, Gary Grossen, also a master cheese maker, joined the dairy plant. Gary's specialties are Brick and Muenster cheese, although he will continue to make all of the cheese types Dairy Store customers have come to expect and appreciate. Thanks to Gary's enthusiasm and cheese making skills, the tradition of high quality cheese produced at Babcock Hall will continue.

The Dairy Plant introduced a line of super premium ice cream last September. Babcock Hall ice cream already falls in the premium ice cream category. The new product was developed by Department of Food Science faculty and staff and is designed to satisfy the tastes of consumers seeking a high end frozen dessert treat. It also meets certain vegetarian criteria since it does not contain gelatin stabilizer. The Super Premium ice cream is 17% butterfat and 37% overrun compared to 12% butterfat and 80% overrun in the regular Babcock Hall formulation. Four flavors are available in pint containers through the Dairy Store.

Finally, to acknowledge the winning Badger basketball team and to honor Coach Bo Ryan, we developed Bo's Express ice cream. Bo's Express is a vanilla-based ice cream with a raspberry ripple and chocolate shavings scattered throughout. Try some Super Premium and Bo's Express ice cream when you come to Madison!

Tom Blattner

Food Scientists as Entrepreneurs

Several of our food scientists have used their knowledge and skills to organize and operate companies. These companies provide either a service or products (sometimes both) to interested persons or firms. This issue of the Newsletter features two such companies.

Norback, Ley and Associates, LLC

Norback, Ley and Associates, LLC was formed in 1993 a few months before John Norback married one of his associates (Kathy Ley). Ever since, this matrimonially enhanced organization has provided software for food safety to the food industry and food professionals around the world. Over this period, associates have come and gone, but they keep plugging away. Even the arrival of a new and permanent associate in 1995 (Seb Norback, now nine years old) did not slow Kathy. She continues to operate the business from the lower level (they prefer "lower level" to basement, but both terms are apt) of their house in Middleton. The firm's products include doHACCP, doFood Safety and stepHACCP, all used to assist in preparation and implementation of HACCP plans. doHACCP is available in English, Spanish, French and Japanese. Another product available is TPRO, software to assist with thermal process calculations. Software is a professional expression just like any other publication. In fact, creating and providing software is the only way Norback has found for *effective* expression of his ideas for management and application of food technology in a food business. To find out more about the company and its products go to the WEB site at www.norbackley.com or contact Kathy by email at nla@norbackley.com, or at (608) 233-3814.

John Norback

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Metabiologics, Inc.

The Food Research Institute (FRI) at the University of Wisconsin-Madison has a rich history of research with *Clostridium botulinum* and its neurotoxins. Beginning with Gail Dack in the 1940s and 50s, several Professors and Staff at the FRI have studied *C. botulinum*, botulinum neurotoxins, and food and infant botulism, including E. M. Foster, Hiroshi Sugiyami, Bibhuti R. DasGupta, Edward J. Schantz, Eric A. Johnson, and others. The FRI has accumulated and developed a vast array of resources including many strains of *C. botulinum* and related clostridia, methods to produce high quality toxins, strategies to assess the risk of botulism transmitted in foods, and means to control growth of *C. botulinum* in foods. As result of this expertise and resources, a spin-off commercial company was founded by Eric Johnson and colleagues from the University of Wisconsin. Metabiologics, Inc. co-founder Eric Johnson began botulinum research at the University of Wisconsin-Madison in 1985, working with the late Edward Schantz at the UW-Madison FRI. Johnson's laboratory has successfully purified seven known serotypes of botulinum toxin.

Metabiologics, Inc. manufactures and sells all seven serotypes of botulinum toxin for nonhuman use by accredited researchers and companies worldwide. The company produces botulinum toxins, toxoids and antibodies, along with ELISA standards and ELISA kits for detection of botulinum toxin. Metabiologics, Inc. manufactures toxin products to the highest industry standard for purity and specific activity, and the company is committed to development of novel, rapid and sensitive botulinum toxin detection systems. It has provided products to more than 100 researchers and companies worldwide. Metabiologics, Inc. encourages research collaborations with individual scientists and corporate entities. Botulinum toxins prepared at Metabiologics are not for human use.

Metabiologics, Inc. is located at 505 S. Rosa Rd., Madison, WI 53719. The company can be reached by telephone : 608-441-2730, fax: 608-441-2731 or info@metabiologics.com.

Eric A. Johnson

R.W. Hartel honored by IFT, AOCS, and Department

Institute of Food Technologists

Richard W. Hartel, professor of food engineering, has been named a Fellow of the IFT. Hartel was honored for being an expert on crystallization and phase transitions in foods and for being a leader in food science education. For more than 15 years, his research has included developing methods to characterize ice crystals and air cells in frozen desserts, controlling sugar crystallization in foods, understanding bloom formation in chocolates and compound coatings, characterizing lipid crystal microstructures and correlating this information with physical properties of fats, documenting penetration of water into sugar glasses, understanding lipid phase behavior, and developing new methods for fat fractionation.

As chairman of the IFT Committee on Higher Education, Dr. Hartel was responsible for implementing new IFT education standards. He has served on several other IFT committees and is on the editorial board of the *Journal of Food Science Education*. Locally, he has served as faculty advisor for the Food Science Club for the past 15 years.

Professor Hartel joins the following UW-Madison faculty who were selected earlier by IFT as fellows: E.M. Foster (1970), K.G. Weckel (1976), O.R. Fennema (1980), D.B. Lund (1980), R.G. Cassens (1981), J.H. von Elbe (1983), E.H. Marth (1983), C. H. Amundson (1987), N.F. Olson (1987), R.C. Lindsay (1988), and M.W. Pariza (1997).

American Oil Chemists' Society

Dr. R.W. Hartel has been selected to receive the Timothy L. Mounts Award from the Edible Applications Technology Division of the American Oil Chemists' Society. Hartel received the award at the annual meeting of the AOCS held from May 1-4 in Salt Lake City, UT. As recipient of the award, Professor Hartel presented the opening lecture in the General Edible Applications Technology session on May 4, 2005. The award recognizes Hartel's research contributions that enhance the scientific understanding of the application of fats and oils in foods.

Department

Richard W. Hartel was selected as the William C. Winder Bascom Professor for the next five years. The Winder Bascom Professorship is awarded to a faculty member in Food Science who holds a research and teaching appointment. The past five years, Dr. Srinivasan Damodaran served as the Winder Bascom Professor.

W.L. Wendorff honored by State FFA

Dr. William Wendorff was awarded the honorary Wisconsin Farmer Degree by the Wisconsin Association of FFA at its 2004 State Convention. The degree is awarded to individuals who have rendered outstanding service to agricultural education and the FFA program in Wisconsin.

Students Receive Honors

IFT Junior/Senior Scholarships were awarded to Bridget Schigoda and Corinne Otte. Bridget also received an Outstanding Sophomore scholarship from the Wisconsin Agricultural and Life Sciences Association (WALSAA). IFT Freshman Scholarships went to Jeff Grummer of Madison and Nicholas Van Epps of Lancaster. Both will be joining our program in September. Based on his record of excellence, Jeff Grummer was also awarded the Joe von Elbe Recruitment Award. This award is funded by the Joachim H. von Elbe Food Science Endowment Fund.

Wei Zhang has been awarded the Norm Olson Graduate Scholarship for dairy research. Wei is a graduate student of Dr. John Norback and is working on the potential for growth/survival of *Clostridium botulinum* in process these products.

Mateo Budinich, a graduate student of Dr. Jim Steele, was awarded the Aleen and D. David Nusbaum Wisconsin Distinguished Graduate Fellowship. This is the first graduate student funded under this new fellowship given by Dave and Aleen Nusbaum. Dave was one of the co-founders of Schreiber Foods, Inc. of Green Bay. (See article about Nusbaum elsewhere in this newsletter).

Brad Bolling, graduate student of Dr. Kirk Parkin, received the Health and Nutrition Division Student Excellence Award at the recent American Oil Chemists Society meeting in Salt Lake City.



Faculty Notes

J. Russell Bishop is chairman of the U.S. National Committee to the International Dairy Federation (IDF) and is the international chairman of IDF's Program Coordination Committee; he also is a member of the U.S. delegation to CODEX Alimentarius (international food code). . . . **Robin K. Connelly** successfully completed requirements for her Ph.D. degree at Rutgers University on July 6, 2004 and on October 1, 2004 was promoted to assistant professor from instructor. . . . **Srinivasan Damodaran** together with **Kirk L. Parkin** and **Owen R. Fennema** are editors of the 4th edition of *Food Chemistry* to be published this year. . . . **Mark R. Etzel** was in Antalya, Turkey from April 27-29, 2004 where he spoke on "Nutraceutical Dairy Proteins for Healthy Foods and Disease Prevention" at the International Congress on Functional Foods Nutraceuticals; on November 3 and 4, 2004 he was in London (Society of Chemical Engineers) and Consett (Millipore Bioprocessing), U.K. where he spoke on "Bioparticle-Ligand Interactions in Adsorptive Membrane Bioseparations". . . . **Richard W. Hartel** and his students presented several papers at the International Conference of Food Engineering in Montpellier, France in 2004; he serves on the advisory board of the Department of Food Science and Human Nutrition at the University of Illinois and on the science advisory committees of Milk Specialties, Inc. (Dundee, IL) and of Karlshamns AB, Karlshamn, Sweden; an article in the June 2005 issue of *Madison Magazine* featured Dr. Hartel and his work with chocolate and other candies. . . . **Barbara H. Ingham** directed filming for video segments for "Food Safety in Your Home," a federally funded project targeting computer-based food safety education for low-income at-risk populations; she also authored and edited videos on "Manufacture and Quality Standards for Ice Cream," "Food Science 'Unwrapped,'" and "'Twas the Night before Exams". . . .

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Steven C. Ingham serves on the tenure committee of the Biological Science Division, the Faculty Senate and is co-chairman of the all-campus biology major; he also is a member of the CALS Academic Planning Council. . . . In March 2004 the American Chemical Society held a symposium on Chemistry and Safety of Acrylamide in Food . . . **Robert C. Lindsay** participated by giving presentations on “Model Systems for Evaluating Factors Affecting Acrylamide Formation in Deep Fried Foods” and “Chemical Intervention Strategies for Substantial Suppression of Acrylamide Formation in Fried Potato Products”. . . . **John A. Lucey**’s graduate students, S. O’Mahony and W. Lee, placed first and second, respectively, in the 2004 American Dairy Science Association graduate student research paper competition; Lucey and his associates presented a paper on producing hard cheeses using recombined milk at the 4th International Symposium on Recombined Milk and Milk Products in Cancun, Mexico in May, 2004; he also spoke on “Rheological and Calcium Equilibrium Changes during Ripening of Cheddar Cheese” at the IDF symposium on Cheese Ripening and Technology in Prague in March, 2004. . . . **John P. Norback** taught a course on statistics for food quality control in Bangladesh in March 2004; he also serves on the CALS facilities committee. . . . **Kirk L. Parkin** spoke on “The Potential for Nutraceuticals and Enhanced Food Products” and on “What are the Potential Health Benefits of Diets Rich in Vegetables?” at the annual Midwest Food Processors Convention in December, 2004 in LaCrosse, WI; he also serves on the scholarships and loans committee of CALS. . . . **Scott A. Rankin** is a member of the CALS internalization committee and the CALS outreach services committee; he also is chairman of the Dairy Foods Division, Institute of Food Technologists and program chairman of the Dairy Foods Section, American Dairy Science Association. . . . **James L. Steele** attended the IDF symposium on cheese: ripening, characterization and technology held in the Czech Republic – he spoke on “Biochemistry of Cheese Flavor Development: New Insights from The Genetics and Physiology of Lactic Acid Bacteria”; he also spoke on “The Use of Genomics to Enhance our Understanding of Cheese Flavor Development” at a symposium on Recent Developments in Dairy Science in Turkey in May 2004. . . . **William L. Wendorff** discussed “Physical and Chemical Characteristics of Sheep Milk Considering Its Subsequent Processing” at the IDF symposium on Dairy Sheep and Goat Sectors in Spain in October, 2004; he is a member of the CALS outreach advisory committee; Wendorff served as a meats judge at the WI State Meat Convention and as a dairy products judge at the American Cheese Society Conference. . . . **Yvonne K. Bushland** is a representative to the Academic Staff Assembly and a member of the Biological and Medical Sciences Academic Staff Review Committee; on the CALS dietetics programs committee and the CASI subcommittee on teaching and advising. . . . **Monica L. Thisis** is co-author of *Introduction to Foodservice*, 4th edition published in 2004 by Prentice Hall; she is a member of CALS committees on instruction improvement, teaching and advising awards, assessment, and leadership. . . . **Robert Bradley** traveled to South Africa in May 2005 to attend a meeting sponsored by the International Dairy Federation; Bob continues to arrange programs for monthly meetings of the Wisconsin Dairy Technology Society. . . . **Norman Olson** tells us that retirement is going well with a combination of volunteer activities and recreation; he and his wife do a few short trips each year including an annual hiking trip with a group from their church.

Elmer H. Marth

Clarence E. (Pat) Johnson, 1923-2005

Emeritus Professor Clarence (Pat) Johnson died of cancer on January 14, 2005 in Madison, WI. He was born on June 25, 1923 in Corvallis, OR, the son of Clarence B. and Lulu M. Johnson. Pat grew up in Pocatello, ID. In 1943, he graduated from the Columbia University Midshipman School and then served three years in the Navy. After WWII, he married Emily Service, who passed away in 1993. Pat received the M.S. degree in dairy manufacturing from Oregon State University and then joined a dairy company (later named Foremost Dairies) and assisted in building and managing dairy plants in Japan, Taiwan, Guam, Thailand, El Salvador and Guatemala. In 1965 Pat came to Madison to attend the UW-Madison and earn the Ph.D. degree in food science. After completing his graduate work, he joined the faculty of the Food Science Department as an assistant professor and extension specialist. In due course he was promoted to associate professor and then to professor. Upon retirement in 1991 he was named emeritus professor. Much of Pat’s work at the university involved organizing and participating in various short courses intended for different segments of the food industry. In 1994, he married Kay Canny who survives together with sons Steven of Madison and Norman of Lyndonville, VT. A memorial service for Pat was held at St. Andrew’s Episcopal Church in Madison on January 20, 2005.

Edward J. Schantz, 1908-2005

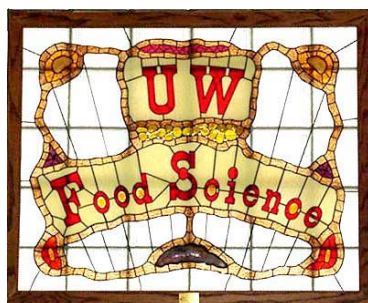
Edward J. Schantz, emeritus professor of food microbiology and toxicology, died in Madison on April 28, 2005. He was born in Hartford, WI on August 27, 1908 and grew up on a dairy farm near Sparta, WI. Ed received the B.S. degree from UW-Madison, the M.S. degree from Iowa State University and the Ph.D. degree (biochemistry) from UW-Madison. After military service in WWII, Schantz worked as a biochemist in governmental laboratories. Later he joined the Food Research Institute as a professor. He was a pioneering researcher on botulinum toxin and especially its use in medical applications. He married Katherine Lee of Depere, WI who preceded him in death in 1998, after 58 years of marriage. He also was preceded in death by a daughter, Mary Jane. Ed is survived by five children: Mary Krueger (Jay, NY), Edward, Jr. (Champaign, IL), Katharine Fleisner (Pittsburg, PA), Elizabeth Burmaster (WI superintendent of public instruction, Madison), and Robert (Bend, OR). He is further survived by a sister, two sisters-in-law, grandchildren, great grandchildren and other relatives. Funeral services were private.

Yo-Shen Chen is an assistant professor of food microbiology in the Department of Food Science, Nutrition and Health Promotion at Mississippi State University; he is teaching courses in food microbiology and in food fermentation techniques; his research is on lactic acid bacteria—their probiotic effect and antagonism toward pathogens . . . **Brenda Dropp** is with the National Food Laboratory in Dublin, CA . . . **Marcel Salonga** is with Perfetti/van Melle, a candy manufacturer in Kalamazoo, MI . . . **Sarah Rauschenberger** is a food technologist at the H. J. Heinz Co. in Pittsburgh, PA; she is working on condiments such as gravies . . . **Melanie Dineen** now lives in Watertown, MA and has started a new job as applications technologist at SunOpta Ingredients in Bedford, MA . . . **Fathy El-Gazzar**, professor of dairy microbiology at the University of Assiut in Egypt, recently spent several weeks at the Ohio State University and at the University of Florida on a program to improve teaching in the animal sciences; in August, 2005 Fathy is scheduled to become chairman of the Department of Dairy Science at the University of Assiut . . . **Alex Woo** is now the technical director at Degussa Flavors in Cincinnati, OH . . . **Tom Vergerant** was in the food industry (Universal Foods, Tolibia Cheese, Wausau Papers) for 27 years, but now is in the financial securities business as a consultant for Smith Barney in Rhinelander, WI . . . **Rob Lombard**, formerly with Kraft Foods in East Hanover, NJ, now is with General Mills in Minneapolis, MN as a scientist II . . . **Habibollah Faraji** is a research associate in the Department of Food Science, University of Massachusetts in Amherst, MA where he is working on the impact of physical properties of emulsions on lipid oxidation . . . **Michael Doyle**, regents professor of food microbiology and director of the Center for Food Safety at the University of Georgia-Griffin received the 2004 Scientific Achievement Award from the American Meat Institute; the award recognizes Doyle's important and groundbreaking research into microbial pathogenicity, development of methods to detect pathogens and identification of means to control or eliminate pathogens in foods and in live animals . . . **Bernard Prior** is at the University of Stellenbosch in South Africa where he recently completed a six-year term as chairman of the School for Biological Sciences . . . **Marcia Rauwerdink** is director of business development for Dairy Concepts, L.P. with headquarters in Springfield, MO; she lives in nearby Nixa, MO . . . **Byron Brehm-Stecher**, formerly with Applied Biosystems, Inc. in Bedford, MA, now is assistant professor of food safety and microbiology in the Department of Food Science and Human Nutrition at Iowa State University, Ames, IA; his research involves development of rapid methods to detect food-associated microbes and methods to control microbes in foods and on food-contact surfaces . . . **Steven Treis** is the night plant manager at Gehl-Guernsey, Inc. in Germantown, WI; he, his wife, and three children live in West Bend, WI . . . **Katie Torrison** is a technical services associate at Cargill Meat Solutions in Nebraska City, NE; she lives in Bellevue, NE . . . **Julie Borgwardt Wankowski** is a senior account manager at Silliker Laboratories; she covers Wisconsin and Minnesota and lives in Pleasant Prairie, WI . . . **David Thomas**, formerly with General Mills, is now vice president-research and development at Kerry Sweet Ingredients . . . **Rebecca Hohlstein**, a food microbiologist, authored an article on "holiday food safety" that appeared in *Lab Reporter* published by Fisher Scientific at the end of 2004 . . . **Wiwid Paramita** is with Kerry Ingredients in Beloit; her picture appeared on the inside front cover of the summer 2005 issues of *On Wisconsin*, the alumni magazine published by the Wisconsin Alumni Association.

Leo Whitehair died on November 2, 2004 in Rockville, MD. A native of Kansas, he received B.S. and D.V.M. degrees from Kansas State University and the Ph.D. degree in food science (dairy and food industries) from UW-Madison. From 1962 – 1967 he was a lieutenant colonel at the Atomic Energy Commission in Germantown, MD. His career with NIH began in 1967 and ended with retirement in 1999 when he was director of comparative medicine at NCRR.

Charles Mulholland of Arvada, CO died on March 17, 2004.

Daniel David (Dave) Nusbaum, age 91 years, died in De Pere, WI on May 10, 2005. He was born in Goshen, IN on November 12, 1913. At the age of 5 years, he and his family moved to Park Falls, WI where his father managed a farmer-owned cheese factory. In 1936 he received the B.S. degree in dairy science and in 1938 the M.S. degree in dairy industry from UW-Madison. He then became an assistant professor of dairy industry and did extension work largely with the cheese industry. His industrial career began in 1942 with the Wheeler Cheese Company in Green Bay. In 1945, he and Merlin Bush founded what today is Schreiber Foods. Over the years, Dave held various positions with the company and remained on the board of directors until his death. Nusbaum was president of the National Cheese Institute (NCI) and of the Wisconsin Association of Milk and Food Sanitarians. He served on the CALS board of visitors and was an advisor for the WI Center for Dairy Research. He received the NCI Laureate Award (1996), honorary recognition from CALS (1995), and a commendation from WI Governor Tommy Thompson (1993). He is survived by eight children, as well as grandchildren and great grandchildren. He was preceded in death (September 20, 2004) by his wife of 62 years, the former Aleen Kuhlman.



News from the CDR

Rusty Bishop is the Chair of the Programme Coordination Committee of International Dairy Federation (IDF), which also includes membership on the IDF Management Committee and the Council/General Assembly of IDF. In addition, he is the Team Leader of the Codex guidelines on validation of food hygiene control measures and serves on the U.S. delegation to the Codex Committee on Milk and Milk Products. As chair of US/IDF National Committee (USNAC), Rusty extends an invitation to attend the 2005 IDF World Dairy Summit which will be held in the city of Vancouver, September 17th to the 22nd, 2005. The theme of this meeting is "Partnering - The future of the world dairy industry," and is co-hosted by Canada and the United States.

The chair of the IDF Standing Committee on Quality Assurance, Statistics, Analytical Data and Sampling is Juan Romero. He also holds membership on the IDF Methods and Standards Steering Committee. Kristen Houck serves on the board of the Wisconsin Laboratory Association. Mark Johnson and Rusty Bishop dodged the dreary end of February when they traveled to New Orleans to speak at DMI's Dairy Innovation Forum 2005.

The 2005 Wisconsin Cheese Industry Conference held at the LaCrosse Center drew record attendance. Technical updates during the conference were presented by CDR staff Mark Johnson, John Jaeggi, Dean Sommer, Kimberlee Burrington and by John Lucey, Dept. of Food Science.

Back in 1994 Jim Path announced the beginning of the Wisconsin Master Cheesemaker Program by putting out a call for applications at the annual International Cheese Technology Exposition (ICTE). Three years later, in 1997, the first Masters graduated at the ICTE awards banquet. Eleven years later, we have 44 Wisconsin Master Cheesemakers.

In the food science world summer is the time for research meetings and this last year was no exception. Carol Chen traveled to the 2004 IFT Annual Meeting, Las Vegas, Nevada to present her research on the "Rheological properties of mozzarella cheese." During your time at IFT you may have sampled prototypes developed at CDR. Kathy Nelson, Karen Smith, and KJ Burrington from CDR's Dairy Ingredients Application program were on hand to talk about the functional and nutritional value of dairy ingredients.

The 2004 American Dairy Science Association met in St. Louis, Missouri. CDR researchers were busy, participating in the presentation of data from the following efforts: Effect of emulsifying salts on the texture of pasteurized process cheddar cheese. N. Shirashoji, John Jaeggi and John Lucey; Effect of insoluble calcium phosphate on cheese functionality. J. Choi, D. Horne, Mark Johnson and John Lucey; Use of reverse osmosis concentrated milk from the manufacture of cheddar and Colby cheese; impact on Ca equilibrium and functional properties. Mee-Ryung Lee, John Lucey and Mark Johnson; Impact of type of concentrated sweet cream buttermilk on the manufacture and functionality of pizza cheese. Tammy Lin, Rani Govindasamy-Lucey, John Jaeggi, Cynthia Martinelli, Mark Johnson and John Lucey; and Nutritional properties of whey proteins. K. J. Burrington.

The September 2004 issue of the *Journal of Dairy Science* includes the article "Standardization of Milk Using Cold Ultrafiltration Retentates for the Manufacture of Parmesan Cheese." Authors of the article include Rani Govindasamy-Lucey, John J. Jaeggi, Amy L. Bostley, Mark E. Johnson, and John A. Lucey, All but Lucey are with CDR and he is with the Department of Food Science

Karen Smith produced two new publications. One is the short version, titled "Whey Processing 101: Bleaching." If you want more information about the same subject you should read the CDR Technical Review on Bleaching. It is available on our website www.cdr.wisc.edu.

Mark E. Johnson was selected as a judge for the 2005 United States Championship Cheese Contest. The 2004 lead judge for the World Dairy Expo Championship Dairy Product Contest was Marianne Smukowski

The CDR webpage has a new look thanks to the efforts of Tim Hogensen, Karen Paulus, Seth Keel, Parikshit Narkhede, Mary Thompson and Joanne Gauthier. Subscribe online to receive the quarterly *Dairy Pipeline* newsletter at www.cdr.wisc.edu.

Brian W. Gould presented "Product Quality and the Demand for Food: The Case of Urban China" at the 2004 Annual Meeting of the American Agricultural Economics Association in Denver, Colorado

The Wisconsin Center for Dairy Research is funded by the dairy farm families through the Wisconsin Milk Marketing Board and Dairy Management, Inc.

Mary Thompson



News from the Food Research Institute

Meetings. Our 2004 Annual Meeting was held in May, 2004 with scientists from university, industry, and government in attendance. Updates on food safety issues were presented and special sessions addressed: (a) obesity and its impact on health and the economy, (b) implications of foodborne pathogens and at-risk populations, (c) microbial adaptations and (d) intervention strategies with respect to prion diseases, ready-to-eat foods, and acrylamide in heated foods.

Starting in 2005, FRI will organize several Focus on Food Safety meetings each year on specific topics in place of our general annual meeting. Our first meeting, in April 2005, targeted "Development and Production of Safe Process Cheese Formulations." Our second meeting will be held in September 2005 and present current information on "Strategies to Enhance Food Safety Using Antimicrobials and Sanitizers."

FRI Acrylamide Consortium met several times in the past year to enable sharing of information among researchers in several departments on campus and those in industry on: mechanisms of acrylamide degradation, effects of potato variety, growth conditions, and storage on asparagine levels and acrylamide formation, and intervention strategies to reduce acrylamide levels in baked and fried foods.

A Symposium on U.S. Food Laws and Regulations was held in June 2004 in cooperation with Covance Laboratories and discussed history and structure of food laws, product development and labeling, and manufacturing issues.

A second annual Symposium on Regulatory and Analytical Challenges for Food and Dietary Supplements was held in August 2004 in cooperation with Covance Laboratories and discussed the obesity epidemic, low carbohydrate foods, trans fatty acids, and regulatory, production, and analytical issues faced by supplement producers.

Research. Our mainstay research focuses on important foodborne bacterial pathogens, including *Clostridium botulinum* and *E. coli* O157:H7, biofilm formation, mycotoxins, the anticarcinogen conjugated linoleic acid, foodborne allergens, and most recently, acrylamide formation in foods. And updated review on bovine spongiform encephalopathy has been prepared and is available on our website (<http://www.wisc.edu/fri/>).

Honors. Dr. Kathy Glass has assumed the presidency of the International Association for Food Protection (IAFP). Dr. Amy Wong has been named an Alternate Councilor to the American Society of Microbiology.

Ellin Doyle

Gifts from Faculty and Others

The University of Wisconsin Foundation has announced two major gifts from faculty members of the Food Science Department. Professor Daryl and Dawn Lund have initiated a \$2 million estate gift to establish the **Daryl and Dawn Lund Chair in Food Science**. This endowed Chair will be selected from current faculty with preference given to a faculty member with expertise in food engineering. The gift also will establish the **Daryl and Dawn Excellence in Food Science Fund** to support the teaching, research and outreach mission of the department and would generally contribute to the welfare and excellence of the department.

Emeritus Professor Owen and Elizabeth Fennema have initiated a \$700,000 estate gift to establish the **Fennema Endowment**. The Fennema Endowment Fund will support faculty scholarship and research for new faculty hires and/or existing faculty. The distributable funds earned by the Endowment will be transferred to the Department of Curriculum & Instruction for the first three years and will then be transferred to the Department of Food Science for the second three years.

We sincerely appreciate the support of our faculty in our *Food Science Educational Investment Initiative: Create the Future* campaign. Since the December 2004 newsletter, the following people also have graciously donated to the Food Science Educational Investment Campaign. Details on how you can provide your gift is included on the inside back cover.

William T. Hamann
Joachim and Carol von Elbe
Cargill Inc.
Galloway Co.
Carol Karahadian
Dr. Robert L. Sellars
Dennis C. Stopen
Jerome & Karen Wallander

Sharyn R. Walker
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Prof. Bernard A. Prior
Joseph R. Shebuski
Russell Tietz

Daryl & Dawn Lund
James C. Canada
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Verizon Foundation

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.

\$250 \$500 \$1000 \$5000 \$10,000 Other

I/we wish to pledge \$_____ each year for ___ years beginning in _____ (year). Please remind me of the annual amount I have pledged in _____ (month).

I/we wish to make a single gift at this time. Enclosed is the contribution of \$_____.

Please charge my gift of \$_____ to my: Master Card Visa Am. Exp.

Card number _____ Exp. Date _____

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I/we wish to designate this gift toward: Graduate assistantships

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Name: _____

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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:**

College of Agricultural and Life Sciences
Dean's Club

Including the UW Foundation in my will

Gifts of real estate

Life income agreements

Establishing a permanently endowed scholarship named for a relative or friend

The Bascom Hill Society

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.

Name _____ UW Degree(s) _____
Year(s) _____

Newsworthy items for the next Newsletter:

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