



University of Massachusetts

Department of Food Science Newsletter

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New Years greeting from Chenoweth Lab!! It has been a very exciting and eventful year here at the Food Science Department. For those of you that do not know, Ferg Clydesdale retired at the end of last June. I was appointed Department Head shortly after Ferg's retirement. This appointment is quite intimidating as I will be following a legend in both Food Science and UMass Administration. During Chairman Clydesdale's reign, both the Food Industry and Alumni came forward to support the Department in ways never seen before at UMass, Amherst. Under Ferg and the Advisory Board's leadership the Department was able to raise over \$4 million dollars including the **Carl Fellers Endowment**, the **Jack Francis Endowed Chair**, the **Graduate Scholarship Endowment** and the **Fergus Clydesdale Endowed Chair**. In addition, Ferg established and lead one of the most successful Academic-Food Industry partnerships in the world. The **UMass Food Science Strategic Research Alliance**, which has now been in existence for over 10 years with over 25 Food companies, brings in critical support for research and more importantly bring together our faculty with industry scientists from all over the world resulting in exciting new research projects in the Department and job opportunities for our students. The commutation of Dr. Clydesdale outstanding leadership skills during his tenure as Department Head resulted in the Department consistently being **ranked in the top 3 in the U.S. and 7th in the world**. These statistics are great badges of pride we can all wear knowing that we graduated from one of the best Food Science Departments in the world.

Last year the Advisory Board decided to develop a Food for Health and Wellness Center in the Department which would be formed via a fund raising campaign that in partnership with the University would provide much needed laboratory renovations for Chenoweth Lab. In recognition of Ferg's outstanding contributions as the Department's leader over the past 20 years, the Advisory Board and Faculty decided to dedicate the Center in Ferg's name. The fund raising campaign for the **Fergus Clydesdale Health and Wellness Center** is already off to a fabulous start raising \$1.5 million of the \$2 million goal thanks to the generosity of both the Food Industry and our fabulous Alumni. Once the \$2 million is raised the University will provide an additional \$6 million to renovate 4 labs including a new teaching lab and creating an additional 3 labs from the old Hotel and Restaurant classroom, kitchen and dining room space on the second floor.

This past October, the Department held its traditional **Alumni Weekend**. During this weekend the campaign for the Fergus M. Clydesdale Health and Wellness Center was officially kicked off. In Ferg's honor, we held an outstanding symposium on "*Advancing the Science, Policy and Communication of Food, Health and Wellness*". Speakers included Noel Anderson, Vice President World Wide Technical Insights, Pepsico, Inc.; Steven Rizk, Director of Scientific & Regulatory Affairs, Mars North America, Susan Borra, President, International Food Information Council Foundation and moderator Ken Lee, Professor and Director Food Safety Center, Ohio State University.



Advisory Board Chair Noel Anderson with Ferg and Lynne Clydesdale at the “Advancing the Science, Policy and Communication of Food, Health and Wellness Symposium”.

Following the symposium, a dinner in Ferg’s honor was held in the Campus Center Auditorium. Following dinner the architectural plans for the Health and Wellness Center were unveiled and Senator Stanley Rosenberg presented Ferg an official recognition of his outstanding contributions to the Commonwealth from the Massachusetts State Senate. The following day included many of our traditional Alumni weekend events including great food product grab bags and an unbelievable raffle with gifts from our generous Alumni and their companies. This was one of the most successful of all Alumni weekends with over 100 people attending at least one of the weekend events. Many thanks to **Amanda Kinchla, Rachel Zemser, Liisa Holcomb, Caitlin Blacker, Margaret Domejczyk, Powel Domejczyk, Cory Bryant, and Cassandra Knight** for their hard work organizing this wonderful weekend. Also, many thanks to all who attended and donated gifts for the grab bags and raffle. Ken Lee has put together a great web site with pictures taken by Pam Rizk from the weekend which you can view at <http://www.foodscientist.org/rizk/fmc.htm>.





Other Departmental News

There are many other exciting initiatives going in the Department. The graduate student endowment is now established and we will be admitting our first **Food Science Graduate Fellow** for fall admissions. In addition, we have a Fellowship available for a minority graduate student that was funded by Pepsico. We are actively recruiting for this Fellowship so if anyone knows of minority students interested in graduate studies in Food Science please encourage them to apply. The Department will also give out the first **Herbert O. Hultin Scholarship** in Food Science this spring. The scholarship will be given to an outstanding graduate student already in our program. Thanks to all involved in getting Herb's scholarship together so quickly so we are able to honor Herb this year. This is a very exciting time to see the generosity of our great Alumni, friends and supporting Food Companies providing us with the means to recruit the top Food Science graduate students in the world and recognize the hard work of our outstanding students already in the Department.

Another great accolade for the Department is our continued success with our undergraduate program. Our undergrad numbers have grown to heights that have not been seen in over 20 years. Even with this growth, the quality of the program continues to be outstanding due to the unbelievable commitment of the faculty to provide a great undergraduate student experience. Each year the University surveys graduating students on their interactions with their Departments. This year, the Food Science Department was again **ranked number 1 out of 56 Departments on campus in the UMass Student Satisfaction Survey**. This is the 3rd year in a row that we were ranked number 1. No other Department on campus has ever earned this prestigious ranking for 3 consecutive years. In many ways this is again thanks to our great Alumni who have given the Department the financial support to provide scholarships and funding for undergraduate activities.

The Department has also been hard at work in developing new graduate programs. The first is a **1 year non-thesis M.S. program** that is focused on students that do not have an undergraduate degree in Food Science. This bridging M.S. program allows students with degrees in other science fields the opportunity to gain valuable experience in Food Science in a compact degree program. We accepted 6 new students this fall, so the program is off to a great start. We have also established a new non-thesis **M.S. program for Culinary Science**. This program is designed for students with Culinary Arts degrees who would like to develop expertise in Food Science. More details on both programs can be found on our web site at: <http://www.umass.edu/foodsci/graduate/gradRequirements.html>.

Faculty News:

Below are some highlights of Faculty research that have been used as press releases by the University. These can be seen on <http://www.umass.edu/loop/>.

USDA awards \$700k to McClements for bioactive lipids research

Food Science professor D. Julian McClements was recently awarded two U.S. Department of Agriculture National Research Initiative grants for more than \$700,000 to use structural design technologies for development of foods with improved nutritional attributes. Both grants focus on bioactive lipids, which have been shown to reduce the risk for diseases such as obesity, coronary heart disease, diabetes and cancer.

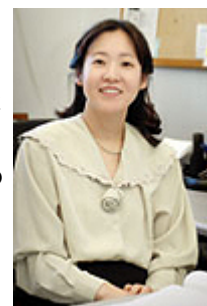


The first grant is to develop technologies to designing novel food functionality to encapsulate, protect and deliver bioactive lipids such as omega-3 fatty acids. The project will lead to the development of structural design principles that could be used by the food industry to produce bioactive lipid-loaded biopolymer particles suitable for application in a wide range of foods.

The second grant deals with the design of nano-laminated coatings that can control the bioavailability of food lipids. The technology can be used to control the digestibility and bioavailability of oils and fat. Fully digestible coatings could be designed for lipids such as omega-3 fatty acids, carotenoids and phytosterols which would benefit from high bioavailability that would increase their bioactivity. Fully indigestible coatings could be used to create innovative reduced-calorie foods, by making some or all of the lipid phase indigestible. Coatings with controllable digestibility could be used in targeted delivery systems designed to deliver bioactive components to specific locations within the GI tract such as the small intestine or colon.

Park's research could bolster bone strength, prevent osteoporosis

Yeonhwa Park, assistant professor of Food Science, recently received a two-year, \$407,000 grant from the National Center for Complementary and Alternative Medicine to improve osteoporosis prevention and treatment. She is testing a new compound that could boost the efficiency of dietary calcium and nudge marrow stem cells to form new bone, even in older adults, when taken as a supplement with calcium. Campaigns to persuade millions of women to take calcium supplements have raised awareness and are a step in the right direction, Park says, but taking calcium by itself has limited effect. Her research has identified a food compound known as conjugated linoleic acid (CLA) that shows promise as an additive that might put calcium to work more efficiently and build stronger bones, especially in older people where it is needed the most. CLA was discovered in the 1980s in ruminant animals such as cows and sheep.



Among other things, CLA seems to regulate fat formation, Park explains, and in bone marrow, stem cells have the option to form either fat or bone cells. Further, it is known that in older animals bone marrow stem cells tend to favor fat cell formation at the expense of bone. But there's some evidence that when more CLA is available in marrow, stem cells will opt to form more bone cells. If Park and colleagues can find a way to nudge stem cells to form a higher percentage of bone cells and not fat, the supplement might help prevent osteoporosis. Park's two-pronged study will test CLA plus calcium in a living animal model in mice and in a laboratory tissue model using mouse bone marrow stem cells. The two experiments will build on the food scientist's earlier observation that when extra calcium is available in the diet plus CLA, total bone mass improves. With their new experiments, Park and colleagues will extend this knowledge to see whether CLA plus calcium supplement in the diet can slow bone loss in ovariectomized mice, that is, in animals forced into early menopause, which mimics old age. At the same time, they'll study bone marrow tissue to try to find a mechanism that can explain how CLA plus dietary calcium supplements might improve bone mass.

As with some other animal laboratory work, Park cautions, in this case the CLA plus calcium model for improving bone mass seems to be more robust in mice than in humans. Nevertheless, she is hopeful that by pinpointing the mechanism for enhanced bone formation in marrow stem cells and adding dietary CLA, she might devise a new preventive strategy for humans, to reduce the more than 2 million bone fractures per year estimated to be related to osteoporosis.

Clydesdale gives invited lecture at ACS meeting

Fergus M. Clydesdale, Distinguished Professor and head of the Food Science Department, presented the 2008 Sterling B. Hendricks Memorial Lecture on Aug. 19 at the 236th National Meeting of the American Chemical Society held in Philadelphia.

Clydesdale's lecture was titled "A Nutritional Odyssey: From Famine to Feast, Can Science and Policy Solve the Dilemma?" Sponsored by the Agricultural Research Service of the U.S. Department of Agriculture, the invited lectureship was established in 1981 to recognize



scientists who have made outstanding contributions to the chemical science of agriculture. Past Hendricks lecturers include Stanley B. Prusiner, the Nobel laureate who discovered prions.

Ron Labbe gave a talk at the American Society for Microbiology annual meeting on food borne pathogens associated with seafood. He also continues his role as the Graduate Program Director and has been instrumental in developing the new graduate program initiative described above.

Bob Levin gave a presentation at the Atlantic Fisheries Technological Conference on pathogen detection. Bob also continues his work as the coordinator for our Seafood Safety Federal line item grant. The Seafood Safety program has now brought in over \$1.9 million in research funds.

Ray Mahoney has been working hard on the development of a new course, FdSci 160, "The Nature of Food". This course looks into the basic scientific nature of foods in terms of their physical structure, chemical composition and biological function to help understand the factors affecting indices of food quality such as appearance, texture, flavor and nutrient value. The course has been extremely popular with undergraduate students and Ray is currently expanding the course to accommodate more students

Julian McClements held his 3rd Food Emulsions Short Course this fall. This short course is quickly becoming the must attend short course for scientist who want a strong background in food emulsions. Julian was also an invited speaker at Controlled Release Society conference in New York City.

Lynne McLandsborough ran a new undergraduate summer research scholar program which was funded by Pepsico. This new program was conducted in conjunction with Cornell to bring outstanding undergraduate student onto campus to participate in research activities. Lynne also was the Chair for the Department Head search committee and was an "Ask the Expert" for 2 reports in Scientific American.

Yeonhwa Park is currently serving on the National Academy of Sciences, Institute of Medicine expert panel for the National School Lunch and School Breakfast program. The first phase of the evaluation has been completed and has identified foods and nutrients that merit special consideration because a significant proportion of children are consuming too few of them or taking in excess amounts. Phase II will determine changes needed to improve the nutrition of the foods in the School Lunch and Breakfast program. In addition, Yeonhwa gave invited talks at the Korean Society of Food Hygiene and Safety and 8 Korean Universities. Dr. Park was also elected Secretary of IFT's Food Chemistry Division

Micha Peleg has kept up his usual schedule of international work again this year including visits to University of the West Indies, Valparaiso – Technical University Federico Santa Maria in Chile and University of Santa Catarina in Brazil. Micha also gave a paper at the American Microbiology meetings in Boston and he has posted a microbial modeling program available for free on the web. You can find these modeling programs on Micha's lab web page at <http://www-unix.oit.umass.edu/~aew2000/>.

Kali Shetty has been extremely busy in international programs as well including membership in the International Advisory Committee in Food and Agricultural Biotechnology Development in the State of Karnataka, India, external examiner for Ph.D. candidates in Brazil, China and Canada and a visiting Professor at the University Autonomous of Nuevo Leon, Mexico. Kali has also been working with the Jefferson Science Fellow Program on a large global project with Partners in Progress of Pennsylvania to "develop and advance food security and food diversity in Haiti and Latin America".

Our newest faculty, *Hang Xiao*, is off to a fast start giving 2 papers at the American Association for Cancer Research and one of six oral presentations at the Frontiers in Cancer Prevention Annual Meeting. Hang was also awarded a grant from the Institute of Food Technologists and American Society of Nutrition to attend a grant writing workshop and has secured a Faculty Research grant from UMass.

Even though *Fergus Clydesdale* tells us he is retired, he continues to be extremely busy especially as Director of the Food Science Policy Alliance. The Policy Alliance held an extremely successful symposium on “Obesity and Health: Modifying Behavior, Modifying Foods or using Policy to Optimize Both” last summer. This year the Alliance will convene a workshop to write a Best Practices Paper for conducting clinical studies when studying the effects of food ingredients on behavior. The Alliance group also graduated its first student, Laura Pillsbury. Ferg is also working with the Food and Nutrition Board at the National Academy of Science.

I have been doing work with the Food Forum of the Institute of Medicine by serving on the organizing committee for a conference this fall on Nanotechnology and Foods. I was also invited to give talks on Bioactive Lipids and Functional Foods at the European Lipids Federation Conference in Athens Greece and at two Functional Foods Conferences in Taiwan.

Student News:

As I mentioned earlier, we have an extremely gifted group of undergraduate and graduate students. The success of these students is reflected by their numerous scholarships. Our top Departmental **Perrozzi Scholarship** was awarded to *Peter Rowell*. Four students received **Buttrick scholarships**: *Kaitlin Ewald, Russel Fortin, Jacqueline Mathews* and *Daniel Vollmer* while *Ashley Han* received the **Nilsson Scholarship**. Due to the continued generosity of our Alumni, we were able to award **11 Alumni Scholarships** to: *Alissa Allen, Ashley Horner, David Johnson, Kevin Johnson, Pui Ying Lee, Sara Martin, Julia Morgan, Stephan Warner, Jeffrey Barish, Anna Konde* and *Brian Wilson*. Our students have also been very successful with scholarships at the College level with *Ashley Han* receiving the **Ascension Farms** and **New York Farmers Scholarships** and *Kaitlin Ewald, Ashley Horner, Jacqueline Mathews* and *Daniel Vollmer* receiving **New York Farmers Scholarships**.

Our graduate students have also been busy accumulating awards including *Thaddo Waraho, Thrandur Helgerson* and *Young Hee Cho* receiving **Honored Student Awards** from the **American Oil Chemist Society**. *Thrandur Helgerson* also received first prize in the poster competition in the **Food Chemistry Division of IFT** at last summer’s annual meeting. The title of the poster was: “*Effect of Lipid Composition on Physical Stability of Solid Lipid Nanoparticles*”. *Young Hee Cho* also won an award to present her research at a future **American Chemical Society** Meeting. *Marcia Pinto* and *Lena Ranilla* both completed their doctoral dissertation as the first students in a joint “sandwich” program with the University of Sao Paulo, Brazil and Food Science/UMass.

Finally, I hope to see you at our **Annual Alumni Breakfast** that will be at **IFT** on Tuesday, June 9th. Don’t forget to buy your tickets when you register or buy them on site at least one day in advance. Have a great New Year and hope to see you soon.

Eric Decker
Department Head