FOOD INNOVATION CENTER NEWSLETTER

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Department of Food Science and Technology
The Food Processing Center

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UNIVERSITY OF NEBRASKA-LINCOLN

Committed to collaboration and exploring new ways of thinking

As another semester passes, we've brought on some new faculty members. Dr. Dongjin Park is joining Jiajia Chen and Mei Lu in China going into our second semester of teaching for the 3+1 program. We've also brought on board Chris Ebbers, a CASNR alumnus who will be our student success navigator for the program. He will be working with Nebraska students in both Lincoln and at Northwest Agriculture and Forestry University in China to ease their cultural transition. He's also working with faculty to prepare them for the 50 students we will receive this fall. Since students will only be here for a year, we want to expedite the process of cultural integration to make the most of their time.

Searches for three additional faculty members are underway. Two of the three positions are for professors of practice in Lincoln that will help with the influx of students this fall. The third position is a laboratory coordinator that can assist in lab set up for four classes.

Construction has begun on offices for the Nebraska Food for Health Center (NFHC) in the Food Innovation Center. A number of the departmental faculty members are a vital part of the NFHC. Clinical lab space will be overseen on a day-to-day basis by the NFHC. The lab is available to anyone within and outside the university.

A scholarship program is being set up for Dr. Glenn Froning, a long-time faculty member who passed away. Donations to the scholarship are still coming in, and I look forward to eventually offer scholarships out of that endowment. In fact, next year, we'll be able to offer an even greater number of scholarships than in previous years due to a number of kind donors.

As some of you may have heard, we are seeing budget cuts across the university. We're not necessarily pessimistic about it, but we will need to enter into a phase of budget planning. No matter what happens, I think there will be some readjustments in terms of funding, so we have to strategically consider what we excel in and what areas we should let others take over.

As always, I'm excited to showcase our services, students and research in this newsletter. I'm very thankful for your continuing support that has helped keep up a tradition of excellence in our program.

Best wishes,
Curtis L. Weller, Ph.D., P.E.
Professor and Head, Department of Food Science and Technology
Director, The Food Processing Center

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Focus on Faculty – Bob Hutkins

Dr. Bob Hutkins initially planned on spending a few years at Nebraska, but 30 years later, he's still teaching and conducting research. The St. Louis native has grown both professional and personal roots, and he's been happy to stick around.

"When I got here, I was a part of a group of young faculty members, and there were quite a few senior faculty members, which was a great environment for me because I had great mentors," said Hutkins. "Now, it's kind of flipped. We have so many more young faculty that keep me energized."

In the classroom, Hutkins teaches courses like food microbiology, microbiology of fermented foods, dairy technology and contemporary issues in food science. Outside of teaching, he works with the Nebraska Food for Health Center as a microbiologist. He focuses in on bacteria in the gut, particularly the kind associated with fermented foods, and believes there are connections between those food microbes and gut health.

To Hutkins, research is endlessly exciting. The opportunity to discover something, whether it's small or groundbreaking, drives him to keep diving deeper. He loves inspiring that drive in the students he teaches, too.

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While Hutkins was a student himself, he almost studied English. Even though he pursued a science route, he still finds time for writing through a monthly Lincoln Journal Star column called "Ask the Food Doc." It's a fun way for him to have more creative license with his writing beyond the structured style of research. After hosting the column for almost seven years, he still receives questions that challenge him, and he's more than happy to find the solution.

Wehling Becomes New Academic Program Coordinator

Randy Wehling is celebrating his 34th year with the Food Science and Technology department with a new title, academic program coordinator. Now, in addition to his teaching duties, he's assisting department head Dr. Weller with the oversight of the department's teaching program and budgets, overseeing curriculum, advising undergraduates, teaching budgets and updating bulletins and course listings.

In high school, Randy wanted to work for NASA as an aeronautical engineer, but he graduated right at the end of the Apollo Program and Vietnam War, so many people in that position were starting to mow lawns instead. He grew up on a farm near Odell, Nebraska, so agriculture was a natural interest. He liked science, especially chemistry and physics, and after looking through degree options, food science seemed like the right fit. After completing his doctoral work at Kansas State in grain science, he joined Nebraska's FST department the very next week.

When asked why he's stayed here for over three decades, Randy says, "I've been treated well. The department has always had great support from the administration, and I like the people I've worked with over the years." He's never felt an urge to "move on" to anywhere else because he doesn't think it gets much better than Nebraska.

Randy immensely enjoys working with students. To him, it's rewarding to see them graduate and do well in their chosen career paths. It's a pleasure to run into them at a conference or professional meeting and hear about their success. He finds an even greater sense of accomplishment when the students who weren't necessarily the top of their class are still thriving after college. It makes him think, "Okay, maybe I had a little part in mentoring these students along the way."

Brewhouse Supports Beer Industry

The Food Innovation Center Brewhouse opened its doors in January of this year. The three and a half barrel brew system was donated and installed by American Beer Equipment. The system can be used for research into craft beer and other fermented products, developing/ testing related products with industry partners and student instruction.

The brew system makes experimenting with yeasts, hops and fermentation easier due to its medium scale. Most local brewers have systems that produce large batches, which can be wasteful for multiple experiments, or smaller, home-brewed batches that don't always scale up consistently. The FIC equipment provides the perfect middle step for testing new brews.

Tests may even incorporate staple Nebraska products, like corn," said Russell Parde, an associate pilot plant manager. "We're looking at doing more specialty grains in beer, which aren't always seen as hip in the craft brew world, but they're worth trying out."

Not only is the equipment useful for local breweries but also ingredient research. The university has recently expanded research and outreach efforts to Nebraska brewers, launching a hops growing project that looks into hop extractions in the Midwest versus the traditional Northwest area. The research project has the potential to expand hop production in Nebraska while also offering farmers an opportunity to diversify crop production.

Pricing for FIC Brewhouse services varies depending on projects specifics, since some may require only fermenting or brewing. On average, services run around $1500. Parde claims clients get the best of both worlds working with his team. As a nonprofit, public organization, they're invested in serving the food and beverage industry, but they also have years of experience working with private industry clients.

How Can High Pressure Processing Benefit You?

Nebraska's Food Processing Center is one of few applied research hubs that offer high pressure processing (HPP) services in addition to its full suite of food-testing services. It is also one of a handful of university service centers that has two HPP units. One is in a food-grade lab that is used for HPP product development and shelf-life studies, and the other is in a non-food-grade lab for validating HPP treatments with pathogen-inoculated products.

High pressure processing is an alternative to thermal pasteurization that uses high pressures to kill pathogens. It works best with high-moisture products like juices, dressings, dips and lunch meats. The process may be used to cut down chemical preservatives while keeping the same shelf life and, although it adds cost to the product, it gives consumers that are interested in "natural" products more choices.

"High pressure processing allows some food manufacturers to maximize the shelf-life of their products," said Dr. Mary-Grace Danao. "With a longer shelf-life, the food product can be distributed or transported further from production point and last a few weeks or months in the hands of the retailer and consumer. HPP helps extend that time."

There are three basic projects clients pursue with HPP: process development, shelf life extension, process validation. Process development is most sought out by clients who want to preserve products' natural sensory qualities like color, taste, vitamins and nutrients after HPP treatment. After developing the process, employees talk with clients in more detail about what tests work best for their particular product to comply with USDA and FDA regulations.

"We work with a variety of companies," said Dr. Jayne Stratton, "They can range from 10 employees all the way up to Fortune 500 companies. It's not how big you are, it's about how we can help you achieve your goals."

Service costs and study duration vary with each client. It's best to call the Food Processing Center to discuss details about individual projects.

Congratulations to the Graduates

Michael Donoghue – B.S.
Melanie Heermann – B.S.
Shimin Chen – M.S.
Brandon Nguyen – M.S.
Lisbeth Vallecilla – M.S.
Xinyao Wei – M.S.
Mohammed Aldawsari – Ph.D.
Nabaraj Banjara – Ph.D.
Sandrayee Brahma – Ph.D.
Yuan Jin – Ph.D.
Ahmad Salamatullah – Ph.D.

Awards and Recognition

Faculty

DR. STEVE TAYLOR
IFT – Tanner Lecture Award

DR. JOHN RUPNOW
University of Nebraska–Lincoln Parent's Association
Parent's Recognition Award

DR. RANDY WEHLING
University of Nebraska–Lincoln Parent's Association
Parent's Recognition Award

Students

HENOK BELAYNEH
American Oil Chemists Society
Processing Division Student Excellence Award

JULIANNE KOPF
Peter Kiewit Student Entrepreneurial Award

ABBY GEIS
Molecular Mechanisms of Disease Conference
Poster Presentation Award

RAFAEL SEGURA MÚNOZ
Molecular Mechanisms of Disease Conference
Poster Presentation Award

Where are they now?

Purdue recognizes Nielsen for teaching, mentorship

Purdue University has named S. Suzanne Nielsen, professor of food science and Global Faculty Fellow, a 150th Anniversary Professor by the Office of the Provost in recognition of her exceptional teaching and mentorship at Purdue. The Office of the Provost named 10 faculty with this new designation, which coincides with the upcoming 150th anniversary of Purdue. Faculty who receive this distinction also will receive an annual discretionary allocation of $25,000.

Nielsen has been teaching food science at Purdue for more than 30 years and held the post ofdepartment head from 2003 to 2013. Her courses include seminar classes and her signature food analysis courses.After taking an introduction to food science her freshman year of college, she knew almost immediately that teaching food science was her calling.

“I think I knew way back in grade school that I wanted to be a teacher,” said Nielsen. “I went to a one room school house in a rural school, and my teacher was great. I remember going home, lining up my dolls and teaching them.”

In addition to the150th Anniversary Professor Award, Nielsen has received several other awards including the National Excellence in College and University Teaching Award for Food and Agricultural Sciencesfrom the U.S. Dept. of Agriculture, the Carl Fellers Awardand William V. Cruess Awardfrom the Institute of Food Technologists (IFT), the Helen B. Schleman Gold Medallion Award, and the Murphy Award from Purdue. Nielsen is an IFT Fellow and a long-time IFT member.

S. Suzanne Nielsen

Food Innovation Center Rental Space

A few empty spaces for start ups or established businesses are available on the fourth floor of the Food Innovation Center for leasing. The spaces have potential to hold a small pilot plant, a wet chemistry lab or offices. Any build out costs would fall on the renter.

Several wet lab spaces, collectively known as the Biotech Connector, are already built out on the fourth floor. The Biotech Connector provides incubation and acceleration services to bioscience startups and high-growth biotech and research-based businesses. Specifically, the facility offers wet-lab space and utilities to develop commercial proof-of-concept prototypes and is managed by Invest Nebraska.

Limited space remains available on the fourth floor to those interested in creating a partnership with the University of Nebraska-Lincoln. For more information on leasing options at the Food Innovation Center, visit https://innovate.unl.edu/food-innovation-center.

Professional Development Opportunities

Providing the opportunity for employees to learn new skills and update their knowledge is critical for any company to remain viable in the marketplace. The Food Processing Center provides companies with a variety of unique educational and training opportunities so your company can continue to be successful. Each program is designed specifically for the food manufacturing industry. Information is presented by industry and academic faculty experts. For complete information on each event visit fpc.unl.edu.

In addition to the selections below, The Food Processing Center can work with your company to customize learning experiences for your employees. Many workshops can also be presented on-site at your location. To discuss this option please contact Event Manager, Jill Gifford at jgifford1@unl.eduor or 402-472-2819.

Environmental Monitoring–Hands on Training Workshop
July 17-18, 2018

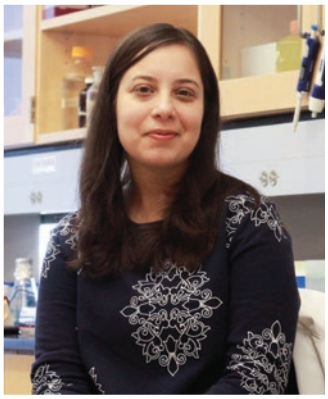
FSPCA Preventive Controls for Human Food Course
September 19-20, 2018

Better Process Control School
September 25-27, 2018

Food Processing Management Certificate Online Program
Ongoing

Recipe to Reality Seminars
June 2, 2018
August 11, 2018
October 27, 2018

Introducing Graduate Student Paridhi Gulati



Paridhi lives by the quote "nothing worth having comes easy," and it's reflected in her work every day. Coming to the states from India certainly wasn't easy, but she thinks it was definitely worth it. To her, Nebraska is a whole new world, and it put her out of her comfort zone. She's constantly impressed by everyone's politeness and dedication to their work, from researchers to grocery store cashiers.

Another challenge for Paridhi has been her work. Her research project started off fairly basic, looking into protein content and quality of millets, beans and wheat. As she worked with millets to create edible, Cheerio-like products, she discovered that cooking them caused the product to be less digestible. Instead of giving up and pursuing something else, she took the advice of her adviser and dove deeper into why this was happening as her thesis.

She's found that when you cook millets in water beyond 50 degrees Celsius, some hydrophobic aggregates form in its protein, which are not normally found in cereal proteins. The aggregates are too complicated for our bodies to break down, so she researched how to prevent them from forming. The solution is simple: use a high-sugar solution or modify the protein structure.

Studying millets is important because most farmers are reluctant to grow them, despite being wonderfully sustainable crops. When grown in rotation, they improve the growth of other plants and require less water. If she can prove that millets are beneficial and worthy of human consumption, the proliferation of their growth will impact the planet for the better.

When Paridhi isn't in the lab, she's going on hikes, studying history or working on her statistics minor. She also appreciates spending time with the friends she's gained through her studies. The culture among the graduate students is very diverse, with only one American in her lab group. This has opened up the world to Paridhi without even having to leave campus.

Sanitation Alliance Improves Industry Safety

The Alliance for Advanced Sanitation was formed in 2015 through the University of Nebraska–Lincoln and other the founding members of Cargill, Hershey, Kellogg's, Nestle, ConAgra Foods, Ecolab, Neogen and Commercial Food Sanitation. The mission of the Alliance is to "create a safer food supply through advanced sanitation approaches and practices."

The work of the Alliance includes identifying and evaluating new and improved materials fit for food manufacturing environments to better control pathogens and biofilms, identifying improved products and methods of cleaning, and improving the effectiveness and ecological friendliness of cleaning agents for all types of manufacturing processes.

Dr. Angela Anandappa, the founding director, claims the Alliance has a much broader potential to help not only the food industry but any industry that has cleanliness at its core, such as healthcare.

"Sanitation is the most basic, routine activity that needs to be accomplished at any plant," said Anandappa. "If there is a mishap in sanitation, the consequences can put consumers at risk and waste large amounts of products. Sanitation is an issue that needs to be worked on daily."

Many larger companies place sanitation as a high priority, not only for safety, but for ecological friendliness. Innovation in sanitation can help reduce or neutralize hazardous chemicals, saving the company money. They also have the opportunity to sell this value to environmentally conscious consumers.

The Alliance has recently released studies on the risks associated with contaminated water condensation in facilities. A few years ago, Blue Bell Creameries faced a major recall due to contaminated condensation that killed several consumers and caused many to become ill. Not only was it a waste of products, it reduced trust in the brand and hurt people's lives. It's important to be able to prevent these issues before they arise.

Members play an important role in shaping the research and direction of the Alliance and have access to unique, university-founded information. This research will teach more people how to make safe, daily decisions and give them a higher knowledge of sanitation overall.

Find out more about the Alliance and it's work at sanitationalliance.org

Introducing Undergraduate Student Leo Ernst

Leo always had an interest in science, but one coding class confirmed that computers were definitely not his forte. Since he had a knack for cooking, his father suggested looking into food science, and Leo found his love immediately. In his opinion, the best part about studying food science is learning more about what goes into our food and how products can go from nothing at all to an item on a shelf.

He's currently the president of the food science club and on the executive team for his fraternity Alpha Gamma Nu. The food science club has industry representatives visit to talk about their companies, jobs and internships. They also take a few trips each year, going to Kansas City this past fall for a few tours. In the spring, they attend an event hosted by the Institute of Food Technology Student Association where students from different schools in the region compete in a quiz bowl competition and hear from guest speakers.

Outside of class, Leo collects and restores cast-iron cookware and has worked at an eggroll factory in Dallas as a quality assurance intern. He checked spices, swabbed equipment and conducted sensory tests. After graduation, he'd like to work at a large food manufacturing company in product research and development, ideally with snack food brands. He understands that it may take a masters degree, though, so he's open to pursuing quality assurance if he decides to take a different route.

Leo believes the new food science facilities and labs is a huge advantage to studying at Nebraska. Additionally, the culture among students creates a very caring environment. No matter what the class, students come together to study and help each other learn.

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The Food Innovation Center newsletter is published by the Food Science and Technology Department and the Food Processing Center in the Institute of Agriculture and Natural Resources at the University of Nebraska–Lincoln under the auspices of the department head.

Dr. Glenn Froning: Teacher, Mentor, Friend

The family and friends of Emeritus Professor Glenn Froning are proud to announce the creation of a scholarship fund to honor Dr. Glenn Froning. Dr. Froning, who died in January of 2017, spent 30 years making an impact on food science at the University of Nebraska–Lincoln. Colleagues, students and all who knew Glenn were inspired by his passion for education. Your gift to this scholarship fund in his name will help ensure Glenn's legacy lives on in the Food Science and Technology Department.

To give to the Dr. Glenn Froning and Family Food Science & Technology Scholarship Fund, contact Doug Carr at the University of Nebraska Foundation, at 402-458-1160 or doug.carr@nufoundation.org.

Thank you for your support of this effort to honor Dr. Glen Froning.

LET US KNOW WHAT YOU THINK!

We'd love to hear from you! For any feedback or story contributions you'd like to see in future issues, email us at **FOODSCI@UNL.EDU**.

University of Nebraska Lincoln