Purdue University

FOOD SCIENCE

SUMMER 2023

PURDUE UNIVERSITY | Food Science

SENAY'S SYNOPSIS

As we reflect on the end of another academic year, I want to recognize our collective accomplishments. Purdue's Department of Food Science is officially 40 years old now, and we celebrated this anniversary on April 14, 2023. Over 100 of our alumni and friends, including every former department head, gathered to share memories and commemorate three decades of growth and accomplishments.

The department unveiled a new Coperion Hybrid Food Extruder at a dedication event on June 6. Designed as the top of its class in both technology and innovation, the co-rotating twin screw extruder opens the door to study emerging markets, such as plant-based meat substitutes, hemp, cereal production, snack foods, pet foods, and the exploration of new extrusion-processed foods. One of the great assets of the Purdue Food Science Department is our history of partnering with leaders in the food industry to increase our research opportunities and our ability to educate the industry leaders of tomorrow. The donation of the Coperion Extruder will enable Purdue Food Science to stay at the forefront of food research and technology by providing learning opportunities, training, and research for the most important aspects of food production sustainability.

Nelson Hall continues to be busy during the summertime. We have hosted several professional workshops, including Aseptic Processing & Packaging, Better Process Control School, and Validation Workshop for Aseptic Processing and Filling. We have also hosted high school and middle school students from around the state through 4-H and FFA programs. Extension teams are in full gear, the Sensory Lab continues to evaluate products, and the Food Entrepreneurship and Manufacturing Institute (FEMI) has been busy with projects for our industrial partners.

We have welcomed new faculty and staff, improved our teaching and research spaces, and opened new lines of research. Food Science faculty have secured grants for numerous projects and initiatives, solidifying our reputation as a leading force in food science research.

Remember, you are part of a tightly knit Food Science community that genuinely cares about your success and well-being. Together, we will continue to forge ahead, making remarkable strides in our shared pursuit of excellence.

I wish you all a happy and healthy summer. Congratulations on another successful year!

Sincerely,

Senay Simsek
Department Head

FOOD SCIENCE BY THE *NUMBERS*

$200,000+
SCHOLARSHIPS AWARDED FOR 2023-2024

PURDUE COLLEGE OF AGRICULTURE RANKED
#3 NATIONALLY,
#5 IN THE WORLD

20+
FOOD SCIENCE INDUSTRIAL ASSOCIATE MEMBERS

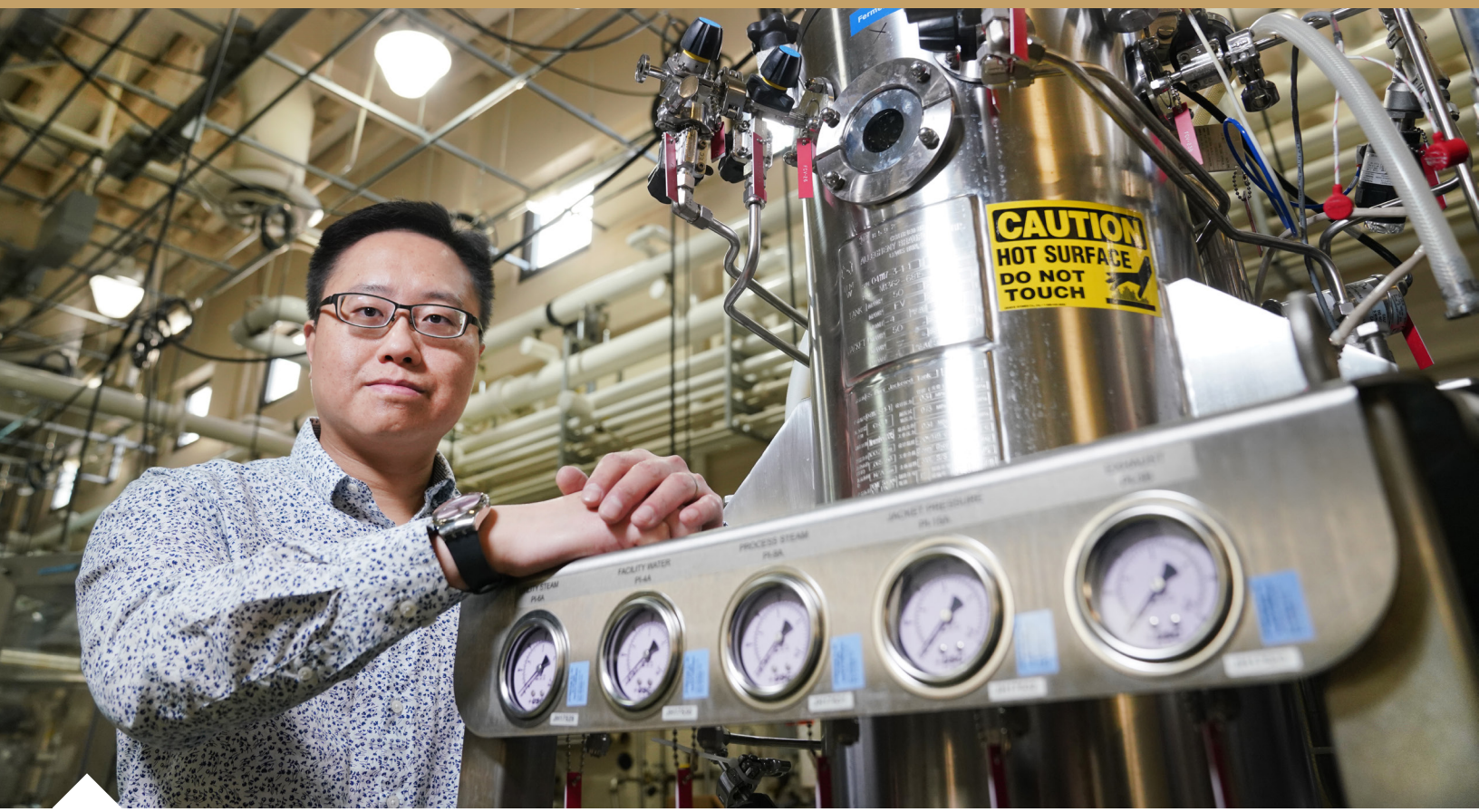
OVER
$15,000,000
IN GRANTS AWARDED IN 2022/2023

PURDUE FOOD SCIENCE CELEBRATES 40 YEARS

In April, over 100 of our alumni and friends celebrated 40 years of giant leaps in Food Science. Attendees were welcomed by all five former and current department heads – Dr. Philip Nelson, Dr. Suzanne Nielsen, Dr. Brian Farkas, Dr. Ken Foster, and Dr. Senay Simsek, who each recapped the successes and fond memories of the department during the reception. Our valued alumni also embraced their school spirit alongside Purdue Pete and the Boilermaker Special shortly before enjoying a classic Purdue meal at Bruno's. Thank you to everyone who was able to join us for this celebration!

DEPARTMENT ANNOUNCES THE ESTABLISHMENT OF DR. JAMES BEMILLER CHAIR IN CARBOHYDRATE RESEARCH IN FOOD SCIENCE

On May 10, the Whistler Center hosted the annual Belfort Lecture and Technical Conference. The event began with the dedication of the Dr. James BeMiller Chair in Carbohydrate Research in Food Science, made possible by a generous donation from Dr. John Fannon. This is a much-deserved honor for Dr. BeMiller! The recipient of this chair will be announced at a later date.



$10 MILLION USDA GRANT

TARGETS MORE MIDWESTERN SEAFOOD PRODUCTION AND CONSUMPTION

Written by: Steve Koppes
Photo by: Tom Campbell

Purdue University has received a five-year, $10 million grant from the U.S. Department of Agriculture to increase the production of seafood, also known as "blue food," which is healthier and more sustainably produced than land-based foods.

"Many studies indicate the importance of increasing seafood consumption in U.S. diets," said Jen-Yi Huang, project director and associate professor of food science at Purdue University. Those studies show that seafood can boost intake of healthy omega-3 fatty acids, vitamins and minerals while also reducing more harmful substances, such as cholesterol and saturated fat.

A 2021 blue food assessment published in the journal Nature found that a 15.5 million-ton increase in aquatic animal-source food by 2030 would decrease the price of such food by 26%. The resulting increase in blue food consumption would result in preventing an estimated 166 million worldwide cases of inadequate intake of micronutrients, such as vitamin A, calcium and iron.

Seafood is readily available in local grocery stores, but about 90% of U.S. seafood comes from abroad, resulting in a $17 billion trade deficit. U.S. fisheries are not sustainable because of overfishing concerns, Huang noted. Aquaculture — growing aquatic organisms under controlled conditions — offers an alternative.

Aquaponics is a combination of aquaculture and hydroponics (growing plants in water) that offers the advantage of intensively producing seafood and plants using less land and water than conventional food production.

The Midwest especially could benefit from aquaponics. The region suffers high obesity rates, operates the fewest aquaculture farms and consumes the least amount of seafood.

"It can increase production yields, but aquaponics production hasn't been widely adopted, especially in the Midwest," Huang said. Energy use in the required greenhouse environment is one key reason.

Aquaponics operations require the daily discharge of up to 20% of wastewater into the environment. For large

farms, that becomes a maintenance cost because they need permits to treat their wastewater before discharge.

"The smaller farms don't need permits," Huang said. "They can discharge whatever they generate, which can cause environmental issues."

With the USDA funding, Purdue researchers will build a pilot-scale integrated aquaponics system on campus, where some lab-scale components already exist, to produce tilapia and lettuce.

Paul Brown, professor of forestry and natural resources, operates experimental aquaponics systems in the Aquaculture Research Lab. Halis Simsek, assistant professor of agricultural and biological engineering, maintains bioreactors in his laboratory for algae cultivation. Jiqin Ni, professor of agricultural and biological engineering, works with anaerobic digesters, which use microorganisms to break down biodegradable matter in an oxygen-free environment.

"Algae cultivation and anaerobic digestion are two of the most important components in Purdue's integrated aquaponic system," Ni said. "We use the algae to treat the wastewater and also anaerobic digestion to treat the algal biomass and other waste streams, like fish processing wastes."

The Purdue system will direct the aquaponics wastewater discharge into algal bioreactors, where algae can feed on its nutrients. The next step is anaerobic digestion, which generates biogas fuel as one of its products.

"That energy can be sent back to the aquaponics system to offset the energy requirement of the indoor facility operation, at least partially," Huang said. The system is designed to generate zero waste and to operate independently of the power grid.

The system also includes a biorefinery subsystem to convert algae and fish byproducts into high-value nutraceuticals, such as bioactive peptide and phenolic compounds. The biorefinery can turn the algae into fish feed for the aquaponics operation as well.

"By integration with the biorefinery, we can have additional revenues for aquaponics farmers so that they can improve their economic viability," Huang said. "We will develop multidimensional sustainability metrics for system assessment and management to make sure that this kind of integration is technically feasible, economically viable and environmentally friendly."

The project will further include stakeholder education and outreach components. The research team will survey farmers and suppliers about the barriers and opportunities for blue foods and aquaponics. The team also will develop workshops to help interested farmers build aquaponics systems or improve their existing operations.

In addition, the grant will foster a workforce that can support blue food production by funding the creation of educational materials for high school, undergraduate and graduate students.

"We also want to educate consumers on the benefit of blue foods so that they can diversify their dietary pattern to include more blue foods and ultimately improve health," Huang said.

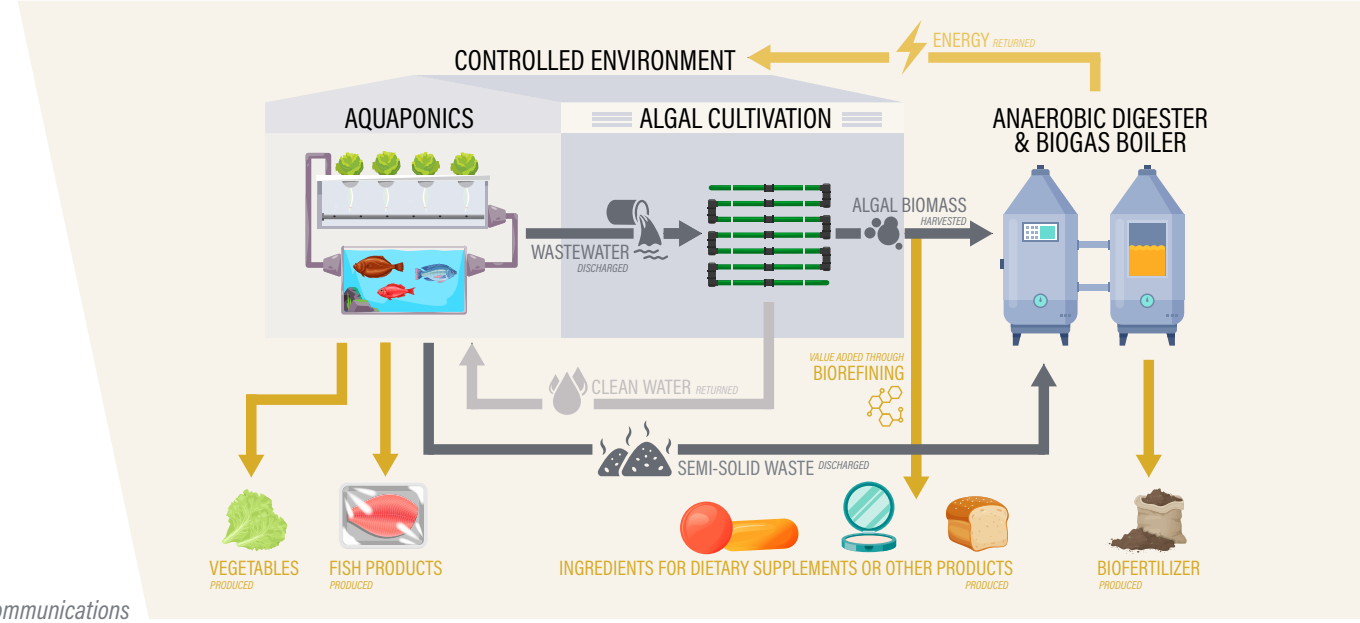


Illustration by Ag Communications

RESEARCH & DISCOVERY

NEW ASSAY ACCELERATES E. COLI TESTING PROCESS

Written by: Steve Koppes
Photo by: Tom Campbell

A team led by Purdue University's Bruce Applegate has developed a new time-saving assay to detect an especially severe strain of E. coli in ground beef.

The toxin produced by E. coli accounts for 175,000 illnesses annually in the United States. The U.S. Department of Agriculture's Food Safety and Inspection Service has maintained zero tolerance for O157:H7, an E. coli strain that can be life-threatening, since 1994. Zero tolerance means that if even one cell of E. coli is detected in a standard 325-gram (11.4-ounce) sample of ground beef, the entire batch is flagged as unfit for consumption.

"The issue is, you need to have a detection technology where you can find one cell in your sample," said Applegate, a professor of food science. But one E. coli cell is almost impossible to find in a 325-gram sample. "There's not a technology able to do that unless you do what we call an enrichment."

The enrichment process entails preparing a special environment that allows E. coli O157:H7 to outcompete all other microorganisms in a food sample before testing.

"Instead of one cell in this 325-gram sample, I will have 10 million to 100 million of these cells in there. I can guarantee I will find it then," Applegate said.

The assay both enriches the sample and can detect E. coli during the 15 hours or more needed to ship samples from a production facility to a testing laboratory of the Food Safety and Inspection Service. Applegate and five co-authors published the details of their assay in the journal Foods.

The new assay saves time by combining enrichment and detection during shipment.

"Having an accurate reading in a very short amount of time means everything to not just the food industry, but safety as a whole," said Chuyan Chen, co-lead author of the Foods paper. Chen, who received her master's degree in food safety and microbiology at Purdue in 2018, now works in the consumer-packaged foods industry. Chen noted that the work can be adapted for application to other food pathogens as well.

"We know that O157:H7 isn't the only microorganism that can get humans sick. There are many others," she said.

Claudia Coronel-Aguilera, another co-lead author and a former postdoctoral researcher in Applegate's lab, now works as a research scientist in the dairy industry.

"For us, time to detection is the main problem. The faster you have results, the faster you release the product," Coronel-Aguilera said. "You're using enrichment during transportation, so when the product arrives, you can already have a positive or negative result."

The new assay has promising implications for nations in Africa, South America and elsewhere that have fewer resources than the U.S. to invest in food safety.

"The testing methods that we have in the U.S. are expensive," Coronel-Aguilera said. But the method described in the Foods paper is a fast, easy and much less expensive version of the highly effective lab methods. "That will be a game changer," she said.

The system is based on phages — viruses that infect specific bacteria.

"We genetically modified this phage in such a way that it would infect the bacteria and cause it to produce light," Applegate said.

After infecting E. coli O157:H7, the phage integrates its genome into the bacterial cells' chromosome. Once integrated into the E. coli O157:H7 chromosome, the phage produces an enzyme that makes light and causes the infected cells to glow. A glowing culture indicates the presence of the pathogen.

"Then you're making more bacteria glow over time. It's like shingles in a way," Applegate explained. "You get chickenpox. You get blisters from the dying cells, but also that virus gets into your cells and then you get shingles later on."

The talk Chen gave about the work won the Best Oral Presentation Award at the 20th International Symposium on Bioluminescence and Chemiluminescence in 2018 in Nantes, France. The phage, she noted, is specifically evolved to infect only one type of bacterium.

"Our phage is not specific to any E. coli, only to E. coli O157:H7," she said.

Additional co-authors of the Foods paper are Arun Bhunia, a Purdue professor of food science, and Andrew Gehring and George Paoli of the USDA's Agricultural Research Service in Wyndmoor, Pennsylvania.

COLLEGE OF AGRICULTURE

GRADUATE RESEARCH

SPOTLIGHT

Written by: Nancy Alexander
Photos by: Tom Campbell

HARRISON HELMICK

Harrison Helmick started working at WheatFields Bakery in his hometown of Lawrence, Kansas, while he was still in high school. He felt that the after-school job was a good fit for his interest in cooking and confirmed his interest in learning more. Helmick earned a degree in bakery science at Kansas State University in 2016 before spending a year in Taiwan, where his then-girlfriend (now wife) taught English and Helmick took an intensive Chinese language course. When the couple returned to the U.S., he joined the nation's largest commercial baking company, Bimbo Bakeries USA. After working third shift, 9 p.m. to 6 a.m., for two years, and developing interests in big data and process improvement, Helmick began searching for a graduate program. He came to Purdue in August 2019 to work under the advisorship of Jozef Kokini, professor of food science and Scholle Endowed Chair of Food Processing. Helmick's experience in industry, where his job focused on improving efficiency by seconds, enabled him to approach graduate study "with a sense of urgency and an ability to see problems and steps to solutions," he says.

Helmick uses bioinformatics to study the processing of plant-based pea protein into gels and emulsions that may be used to improve the texture of food. Specifically, he investigates how cold denaturation impacts the protein's structure and, in turn, its end use characteristics. Much of this work is done through modeling, starting with a 3-D structure of the protein and then writing computer code in Python to analyze it. "Data science is one of my favorite things I do as part of my research," Helmick says. Understanding how these proteins act in a range of applications and predicting their functionality in foods could lead to new applications and healthier foods that cost less to produce. Helmick also has researched wheat dough rheology, which led to his first publication.

Helmick says he has benefited from and enjoyed mentoring four undergraduates – two food science majors and two ABE majors — and helping them develop their research projects. He is first author on six published papers so far. A blog he started based on his research and reading led to an industry trade magazine offering Helmick a position as a monthly contributor on the applicability of different types of plant-based proteins. "That's been a really good opportunity to communicate to industry," he says. "It forces me to get out of the cloud and be more hands-on." His position on the board of the American Society of Baking also helps him stay in touch with industry.

> **"I believe there's a lot of good research done in academia that isn't communicated effectively to industry members. I try to keep more of an industry-focused slant to my research."**
>
> *— Harrison Helmick, PhD student, Department of Food Science*

While he intends to maintain ties to academia after he completes his doctoral program, Helmick expects to land a position in industry, perhaps a technical role that allows him to work at the interface of data science and food science. "Growth and learning is my only non-negotiable," he says. In his spare time, he and his wife enjoy cooking together — Asian dishes from their time in Taiwan as well as southern recipes from his mother's Mississippi origins. He also enjoys playing disc golf.

ZACH HOAG

GRADUATION: **MAY 2023**
MAJOR: **FOOD SCIENCE**
MINOR: **FERMENATION SCIENCE**
HOMETOWN: **CALDWELL, IDAHO**

In high school, I always planned to attend culinary school until I found food science. It combined my passion for food and my love of STEM into a field I could see myself having a career. Purdue has one of the best agriculture colleges in the world and one of the best food science programs, but I ultimately chose Purdue as the school for me because it felt like home when I visited.

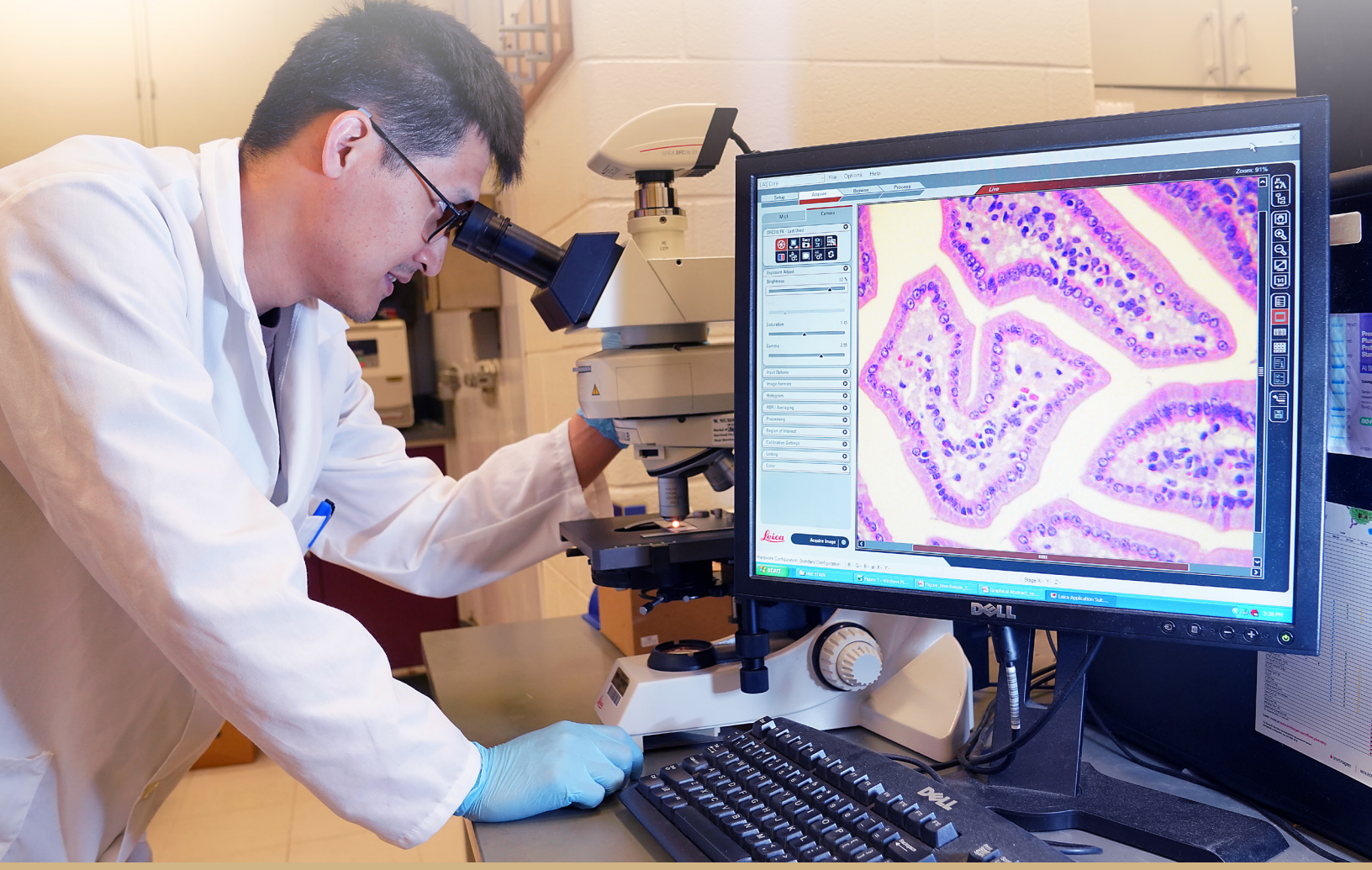
I really found my way as a student at Purdue through the food science department, as well as Boiler Gold Rush. I joined an Institute of Food Technologists Student Association (IFTSA) Mars Product Development Team through my department, where I learned applied product development skills and made more connections with my food science peers. Last year I created the Fermentation Club and am currently its president. Through this club, we have been able to teach students about the art and science of fermentation.

In summer 2021, I was a quality assurance intern with Conagra Brands at their Birds Eye facility in Darien, Wisconsin. This experience was so beneficial because it helped me conceptualize what my future might look like. It was fantastic to apply my food science knowledge in a plant environment, learning a whole lot along the way.

Last semester I joined the Food Entrepreneurship and Manufacturing Institute in the food science department as a student contributor. This opportunity has allowed me to gain hands-on product development skills and experience working with processing equipment, such as a retort.

I also interned as a research and development intern for PepsiCo in Plano, Texas, last summer and received an offer to join them full-time as an associate food scientist after graduation.

Throughout all my experiences, Purdue has felt like home, a place where I thrived.



LABORATORY FISHING EXPEDITION REELS IN A BIG CATCH:

HIDDEN PATHOGENIC ROLE OF A HOUSEKEEPING ENZYME IN LISTERIA

Written by: Steve Koppes
Photo by: Tom Campbell

Purdue University doctoral student Dongqi Liu has identified a previously unknown strategy that the foodborne bacterium Listeria monocytogenes uses to invade and infect humans and animals.

"Listeria is a huge problem in the food industry and for people who get infected," said Arun Bhunia, a food microbiology professor in the Department of Food Science at Purdue. L. monocytogenes infects an estimated 1,600 each year in the U.S., resulting in about 260 deaths. At highest risk are pregnant women, unborn fetuses, immunocompromised and elderly people.

"It's happening from different types of ready-to-eat food," Bhunia said, including fresh produce, fruit, cheese, hot dogs and sliced meat. "Some of your favorite foods could be a major problem." And the only prevention is to avoid eating certain types of food.

After tainted food is consumed, the bacterium causes listeriosis by passing through the stomach and the intestine, then spreading into the liver, spleen and even the brain. Bhunia's previous research has shown that the Listeria adhesion protein (LAP) plays an important role in helping L. monocytogenes to pass through the gut barrier.

But a question lingered about the LAP. After the pathogen secretes LAP, the protein stays on the bacterium's surface. How it does so remained a mystery. LAP must stay fastened to the bacterial surface for Listeria to cause infection.

"If the bacterium has no way of keeping that protein on the surface, it literally has no function," Bhunia said. "It's not helping the bacterium to interact with the intestinal cells."

Now Liu, a Bilsland Dissertation Fellow who works in Bhunia's laboratory, has answered this question. Liu has shown that the pathogen uses a sticky virulence protein called internalin B to anchor LAP to bacterial surfaces.

A better understanding of Listeria could lead to more effective prevention. Virulence proteins are signature molecules that are more commonly found in a special location on the Listeria chromosome called "the pathogenic island."

The virulence proteins of that region all carry a unique amino acid sequence tag that can be utilized to predict its virulent behavior and mechanisms, including how it is secreted and how it is anchored on the bacterial surface.

Arun Bhunia has devoted most of his career to understanding how the foodborne pathogen Listeria monocytogenes causes disease.

LAP may have managed to remain overlooked in listeriosis until now because it doesn't belong in that chromosomal region, and scientists have limited knowledge on how LAP remained attached to the bacterial surface in causing host infection.

Now scientists know that internalin B turns LAP into a moonlighting pathogenic factor by attaching it to a cell's surface in Listeria. The cooperation of each protein is essential for pathogenesis.

Liu and his colleagues used a battery of sophisticated biochemical methods, including fiber-optic sensors, immunoprecipitation, and mass spectrometry, to find the ligand that fastens LAP to cellular surfaces.

"We call it ligand fishing," Bhunia said. "We had a fishing expedition."

LAP is only one fish in a vast biochemical sea, but Listeria associates with other proteins that can help them infect their host organisms.

"LAP is a housekeeping enzyme, so the virulence regulation and the pathogenesis are a bit different than other traditional virulence factors," Lui said.

It's an alternative strategy of the pathogens.

"If one is dropped, they want to survive and so they use another strategy to cause infection," Bhunia said. Understanding this strategy raises the prospect of preventing future listeriosis outbreaks. Further research might reveal how to create conditions that prevent the bacterium or the protein from staying on the surface.

"This is a complicated process. There is no single, easy solution," Bhunia cautioned.

This is not a unique situation for Listeria. Proteins secreted and displayed at the surface like LAP are also found in other pathogenic bacteria, such as Streptococcus pyogenes and Mycobacterium tuberculosis. LAP is the first of its type that the surface anchoring mechanism has characterized.

> **If the bacterium has no way of keeping that protein on the surface, it literally has no function. It's not helping the bacterium to interact with the intestinal cells."**
>
> *— Arun Bhunia, food microbiology professor*

"The pathogens usually secrete large quantities of these enzymes during infection, which is directly associated with bacterial virulence," Liu said. "These proteins or their corresponding antibodies in the host would be a great diagnostic and prognostic marker for infectious diseases."

Multiple serious listeriosis outbreaks motivated Bhunia to begin studying the disease about 25 years ago. Early on, his team identified LAP. Later, he realized that LAP binds to a receptor on epithelial cells to allow the bacterium to pass through the gut barrier.

The new finding could help Bhunia and others develop an antibody supplement or vaccine to prevent listeriosis in susceptible populations, especially pregnant women. Bhunia has patented a bioengineered probiotic that could potentially prevent infections.

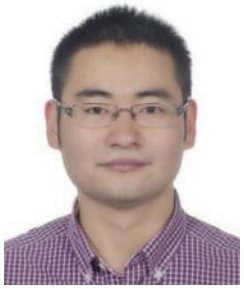
PEOPLE

Welcome to Purdue Food Science!

Please join us in welcoming the newest Purdue Food Science faculty and staff members!

New faculty beginning their employment on August 14

Da Chen - Translational Chemistry Assistant Professor - Dr. Da Chen is joining the Purdue Food Science Department as an Assistant Professor of Translational Chemistry. Dr. Chen was an Assistant Professor of Food Science at the University of Idaho prior to accepting the position with Purdue. Dr. Chen earned his PhD in Food Science from the University of Auckland in New Zealand. If Dr. Chen looks familiar, that is because he was a Postdoctoral Researcher in the Purdue Food Science Department in 2019-2020. Welcome back to West Lafayette, Dr. Chen!



Weicang Wang – Assistant Professor, Foodomics – Foods for Health - Dr. Weicang Wang will be joining the Purdue Food Science Department as an Assistant Professor of Foodomics – Foods for Health. Dr. Wang was a Postdoctoral Researcher at the University of California-Davis prior to coming to Purdue. Dr. Wang earned his PhD in Food Science from the University of Massachusetts-Amherst. Welcome to West Lafayette, Dr. Wang!

Thaisa Cantu-Jungles - Research Assistant Professor - Dr. Cantu-Jungles will be joining the Purdue Faculty as a Research Assistant Professor. Dr. Cantu-Jungles is currently working for Purdue Food Science as a Postdoctoral Research Associate. Dr. Cantu-Jungles earned her PhD.in Biochemistry from the Federal University of Parana in Brazil. Congratulations to Dr. Cantu- Jungles on her new position!

New Staff

Allison Brown - Extension Outreach Specialist and Research Associate in the Department of Food Science

Subhashis Chakraborty - Extension Administrator, Food Entrepreneurship and Manufacturing Institute

Madison Mehringer - Outreach Administrator – Food Entrepreneurship and Manufacturing Institute

Meredith Mallott - Research Project Manager for Dr. Jen-Yi Huang

Patrick Tiffany – Senior Academic Advisor

Elise Whitley - Research Assistant in Carbohydrate Function and Application Lab

ALUMNI AND DEVELOPMENT

Jeff Grogg Named Distinguished Agricultural Alumnus

Jeff Grogg returned to campus in March to receive the Distinguished Agricultural Alumnus Award. This award recognizes midcareer alumni who have a demonstrated record of outstanding accomplishments, have made significant contributions to his/her profession, and exhibit high potential for future professional growth. Jeff earned a bachelor's degree in Food Science in 1992. He spent 16 years at Kellogg and Kashi in various roles before shifting to an entrepreneurial path. Since 2009, he's led JPG Resources in Battle Creek, Michigan, which has more than 65 team members and has launched more than 2,500 products.

Diane Hnat Receives Purdue Agriculture Alumni Certificate of Distinction

Diana Hnat was honored with the Certificate of Distinction at the Purdue Ag Alumni Fish Fry in February. The Certificate of Distinction is the highest award of the Purdue Agricultural Alumni Association and is intended to recognize those who have contributed significantly to agriculture, forestry or natural resources. Diane received a bachelor's degree from Purdue Food Science in 1974, and she received her MBA degree from the University of New Haven in 1980. Diane is currently a Project Scientist at Glanbia, and she has had a successful career in the food industry for over 42 years.

AWARDS

Congratulations to our faculty, staff, and students who received awards this spring!

Faculty

Dr. Arun Bhunia – International Association for Food Protection (IAFP) Fellow

Dr. Yaohua "Betty" Feng – Promoted to Associate Professor with Tenure

Dr. Kee-Hong Kim – Promoted to Full Professor

Dr. Haley Oliver – 2023 Agricultural Research Award; finalist for Diversity, Inclusion and Belong College Team Excellence Award (Food Safety Innovation Lab)

Dr. Lavanya Reddivari – University Faculty Scholar

Graduate Students

Harrison Helmick – Purdue College of Agriculture Graduate Student Spotlight

Undergraduate Students

Dalton Hirsch – Outstanding Food Science Freshman

Teresa King – Outstanding Food Science Sophomore

Yukina Murata – Outstanding Food Science Junior

Zachary Hoag – Outstanding Food Science Senior

OUR GRADUATES

Congratulations to the Class of 2023!

PhD

Gurpreet Kaur
Zach Berglund
Dongqi Liu

Master of Science

Juan Velasquez

Bachelor of Science

Faith Adam
Jessica Armstrong
Jackson Boyle
Isabella Bryan
Kristen Coates
Lauren Decker
Clare Dirksen
Lillian Ferguson
Yang Fu
Zachary Hoag
Marcus Hoover
Connor Hough
Yufan Hu
Matthew Kittaka
Victoria Kuhaneck
John Lemkuil
Chenhai Li
Xilin Li
Isabell Mahin
Meredith Malott
Sanjana Manjrekar
Madison Mehringer
Heather Milliron
Maesa Ogas
Junqi Ren
Ishani Roychowdhury
Genevieve Ruiz
Renee Stieby
Madeline Trevelino
Mary Voigt
Elise Whitley
Alecia Wichlinski
Haohui Zhu
Irene Zou

PURDUE FOOD SCIENCE

celebrates extruder donation from Coperion

Written by: Jillian Ellison
Photo by: Tom Campbell

The Food Entrepreneurship and Manufacturing Institute (FEMI) celebrated the unveiling of a new ZSK 27 Hybrid Food Extruder at a recent dedication event. Donated by Coperion, a global industry and technology leader in compounding and extrusion systems, and its parent company, Hillenbrand, Inc., the extruder, which is valued at more than $900,000, will expand the institute's capabilities.

Designed to be the top of its class in both technology and innovation, the co-rotating twin screw extruder opens the door to study emerging markets, such as plant-based meat substitutes, hemp, cereal production, snack foods, pet foods and the exploration of new extruder processed foods.

"One of the great assets that the Purdue Food Science Department is able to utilize is our history of partnering with leaders in the food industry to increase our research opportunities and our ability to educate the industry leaders of tomorrow," Senay Simsek, professor and head of the Department of Food Science, said. "The donation of the Coperion Extruder will enable Purdue Food Science to stay at the forefront of food research and technology by providing learning opportunities, training and research for the most important aspect of food production sustainability."

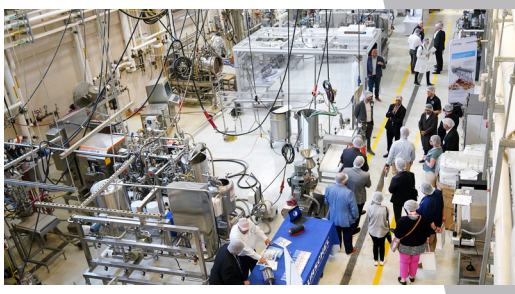
Allison Kingery, managing director of FEMI, said the new extruder replaces the institute's 25-year-old existing Coperion model, allowing for new controls and technology unattainable with the former machine.

"This is a major donation for the students. They will be able to say they have utilized a modern, highly engineered extruder while in school and will be that much further ahead when graduating," Kingery said. "The students will certainly benefit from utilizing a machine with such an exceptional reputation in the food industry."

The addition of the expanded-capacity extruder to the FEMI test lab will not only open opportunities for testing capacities, but also will allow for a full 360-degree loop from development, to research, to design, Kingery said. Nutritional analysis will also be completed on campus from the products produced by the extruder.

Simsek said the extruder also opens new doors of industry partnership, increasing FEMI's platform as a trusted problem solver in the food industry.

"As our global population continues to grow, we need to continually innovate to provide sustainable food sources for this population," Simsek said. "Plant protein, meat analogs, cultured meat and precision fermentation will become even more important in the coming years to sustainably feed the planet."



PURDUE UNIVERSITY®

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EA/EO

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