NC STATE UNIVERSITY

Department of Food, Bioprocessing and Nutrition Sciences **DIGEST 2018**

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Learn more at go.ncsu.edu/fbns

GROWING OUR FACULTY AND OUR FUTURE

The Department of Food, Bioprocessing and Nutrition Sciences (FBNS) at NC State University is home to over 100 exceptional faculty and staff and over 500 extraordinary students spread over our facilities at Schaub Hall and the Dairy Farm in Raleigh, the Plants for Human Health Institute at Kannapolis, and the Center for Marine Sciences and Technology at Morehead City.

This year, we hired a lecturer to teach Food Science courses and an Assistant Professor to conduct research and teach in the area of Food Engineering. We are also at various stages of hiring for several faculty positions, all at the assistant professor level. These include a Teaching Assistant Professor, a Seafood Specialist (Morehead City), a Plant Food Processing Specialist (Kannapolis), a Food Chemist, and a Nutrition Specialist. Additionally, I anticipate having the opportunity to hire one or two more faculty members in the near future.

We are currently working on two major projects. The first involves a $10 million project to build a Food Innovation Laboratory at Kannapolis and the second involves a Dairy Education Center and Creamery at our dairy farm on Lake Wheeler Road in Raleigh. I would like to invite our alumni and industry friends to team up with us as we launch our Industry Partners Advisory Council (IPAC) and chart the course for the future of FBNS with the new strategic plan that we will be developing in the next few months.

I am excited to work with such an amazing group of faculty, staff, students, alumni, and industry partners, and I look forward to what the future has in store for FBNS.

K.P. Sandeep
Department Head

Congratulations to the FBNS Spring 2018 Graduates!

A SEA OF SOLUTIONS

Tyre Lanier's innovative work with surimi has made an indelible impact at the university and on a global industry

It may seem an improbable journey for a red-meats researcher from Georgia with a keen interest in hot dogs, but Tyre C. Lanier came to NC State University on the future of fish more than 40 years ago. It became his life's work as well as his legacy for a global industry.

Lanier's collaborative approach led to a sea change in surimi research, development, education, applications, industry and culture around fish protein. He retired from the Department of Food, Bioprocessing and Nutrition Sciences on July 1. Still, as a professor emeritus, he continues pioneering work borne from that research.

"However, I think the biggest technical contributions have been made by many of our former students who went out into academia and the food industry and continued to innovate," he said.

Surimi is a refined white fish protein used by the Japanese since the 12th century. It allows a manufacturer to imitate the taste and texture of a more expensive meat, such as crab or lobster, and may be eaten as a type of fish cake (kamaboko), fish sticks, fish balls or paste. It also can be molded into variously flavored specialty treats, some nearly elevated to art. If you have eaten a California sushi roll, you have probably eaten surimi.

An Unlikely Evangelist

He has been called an "unlikely surimi evangelist" and concedes it's an unusual devotion to a topic of far-flung origins for someone whose Deep South roots were sowed on meat proteins. The pivot came at a confluence of timing, politics, curiosity and a job opening at NC State.

In 1977, Lanier had just finished a Ph.D. in food science, with an emphasis on muscle proteins, and had a "keen interest in the science of hot dogs" when he accepted an NC State assistant professor position that came with a directive to use new grant money for coastal resource management research.

Lanier's research and leadership have stimulated the development of a domestic surimi industry that's now the world's leading supplier, second only to Japan in production of surimi-based foods.

The UNC Sea Grant arose from the federal Magnuson-Stevens Act of 1976, which promoted optimal use of coastal fisheries, conservation and control over territorial waters. Before then, anyone in the world could fish anywhere, "so this meant we suddenly had a huge piece of the ocean to ourselves—200 miles around every piece of land."

It was quite a challenge, because Japan closely guarded the technical details of the industry, he said. So, starting from scratch, Lanier looked to what he knew and started with hot dogs—fish hot dogs.

'The Hot Dog of the Sea'

"Then I heard about surimi," or as he calls it, "the hot dog of the sea." That set the foundation for what is now a $20 billion global industry with a food presence on five continents. His research stimulated the development of a domestic surimi industry that is the world's leading supplier of surimi-based foods and second only to Japan when it comes to production.

When Lanier started in the late 1970s and early '80s, Americans had no taste for surimi, and there were no surimi products in the foods Americans ate. That changed in the mid-1980s, when King Crab fisheries in Kodiak, Alaska, collapsed from overfishing, and the industry raced to find an alternative.

The industry turned to Japan and its surimi-based artificial crab, which Lanier realized could be produced domestically from pollock in the Bering Sea. He took the suggestion to Alaska's state fisheries and was met with skepticism, even though imported imitation crab was "taking off like a rocket." Eventually, companies came around, and America's first surimi processor opened in Kodiak in 1985.

As the taste for products grew, the world took interest, and from North Carolina to Dubai, Lanier was the man to call. The essential curiosity that launched surimi innovation and discovery has sustained a generation of technological, commercial, and scientific evolution, and NC State has been at ground-zero of everything surimi for decades.

Research, Discovery and Building an Industry

"Our fundamental work sought to understand how proteins and water interact to affect structure of food gels and their water-holding and textural properties, and how water structuring is involved in protein stability," Lanier said. "We had a focus on surimi, but the implications and methods influenced many other food sectors, and that's why I've stayed with it. There's always another challenge, and some of them are quite daunting."

Lanier helped write the book on the subject ("Surimi and Surimi Seafood," CRC Press, 2013), which is in its third edition. He has also published more than 130 scientific papers; earned two U.S. patents; established and taught worldwide surimi schools; and advised the industry and numerous companies.

"If you go into any classroom at NC State University, there is a little sign that says 'critical thinking skills,' and that is absolutely the most important thing–problem solving."

He has earned more than $5.6 million in career grant-research money; serves as a consultant and research director for three companies studying leaf protein; and recently introduced revolutionary surimi technology to recapture wasted protein, increase product, and reduce environmental impacts.

"The surimi refining process is inherently wasteful, and that has always bothered me," he said. "For decades now, I have been seeking a way to economically capture lost protein for food uses. The waste was also an environmental problem."

The dairy industry offers an example to understand the significance of protein recapture for surimi, which relies on a washing process that wastes 40 percent of its protein – it's literally down the drain. Cheese production was losing 20 percent in whey byproducts, he said, but recapture processes there have created a $6 billion industry (think protein powders in all those smoothies Americans make).

The technology that he and his business partners have developed takes surimi wash-water through a process that changes its pH to extract the soluble proteins and fine particulates. That processed water is then put through a centrifuge, and the result is a recoverable protein product that could be made into surimi, nutritional supplements, cosmetics and more, while reducing pollution.

Lanier has estimated it could mean an additional $60 million to $80 million in annual revenue for Alaska's surimi, and the industry has calculated the technology could save plants $70,000 a day in lost revenue. But the "Holy Grail" of surimi research is still out there, he said. Surimi is the only refined protein sold in wet form, and it's made from a cold-water product that doesn't hold up to heat.

"It just so happens, I picked the most sensitive protein on Earth."

Surimi is the only refined food protein that isn't in dry form, he said. Technology that could dry surimi to powder form and then reconstitute it to gel would be a game-changer: Not only could the technology reduce shipping costs by 75 percent, it also could lead to innumerable uses in pharmaceutical, pet-food and other industries.

Curiosity and Critical Thinking

Lanier said the university's standard and value for critical thinking have been central to the challenges, relationships and teamwork that both led the way in discovery and kept him in it. He also counts those values key to the most satisfying experiences in a long career of teaching, mentorship and research that continues into retirement.

"There's always another question to answer," he said.

"If you go into any classroom at NC State University, there is a little sign that says 'critical thinking skills,' and that is absolutely the most important thing—problem solving; taking information to solve real-life problems; and capturing opportunities to solve problems with what you have learned. Are you critically thinking to use basic science to applied problems?"

"I look for students who are curious or have a willingness to be curious. Seeing students have that lightbulb come on—when you see that happen (and you see that a lot), it's really amazing," he said.

Likewise, to consider the arc of technology and innovation during his career has been a gift: "When you see the way things were and the way things are – to watch that technological development is amazing. To be part of a team—it's always a team effort—and when you get that team there, it's a wonderful thing."

Other applications generated from surimi research and development

- The gel-testing methods Lanier's teams developed were adopted for testing and quality control of hot dog texture by a leading U.S. manufacturer. "We also taught a short-course on instrumental methods for controlling texture of gelled foods that was attended by representatives from companies making both meat- and animal-derived gel products in the U.S., Asia, and Europe," he said.
- The team recently explored how gels hold water: Consider why that gelatin, which is more than 90 percent water, will release no water if you squeeze without heating it? "The secret is the capillary properties of all food gels," he said.
- The work led to discovering the physical basis for how hot dogs and luncheon meats hold both water and fat during cooking and subsequent use: "It displaced an erroneous understanding that prevented manufacturers from optimizing their formulations," Lanier said.
- The team elucidated the molecular mechanism of why sous vide cooking will greatly tenderize tough cuts of meat.
- Their research also launched a new industry in formed-scallops for a North Carolina company, which had a huge resource of tiny, but tasty, scallops off the coast of Argentina. The company couldn't sell them at that small size, Lanier said, but found a huge market once the small scallops could be made larger using a meat-gluing enzyme. Just one of those companies is worth millions, he said.
- He patented a method of rapid cooking for all types of meat gels that speeds production without sacrificing texture or cook yield.
- And they developed a yeast-derived enzyme inhibitor to prevent texture degradation by proteases during cooking.

Congratulations to the Food Sciences Club at NC State, 2018 IFT Chapter of the Year!

"THE FUTURE OF DAIRY EDUCATION": CALS CELEBRATES NEW MUSEUM, EDUCATION CENTER AND CREAMERY

A new Raleigh museum will give visitors the unique opportunity to immerse themselves in a dairy farm and learn about the importance of the dairy industry in North Carolina, the history of Jersey cows and more.

After an April 13 dedication ceremony, the Randleigh Dairy Heritage Museum is now open for scheduled tours and soon will have public access times available. The Museum is located on the NC State Dairy Farm , part of the University's Lake Wheeler Road Field Laboratory.

"Today, it's my honor and privilege to celebrate the latest chapter in this long legacy of advancing culture, education and innovation through the dedication of the Randleigh Dairy Heritage Museum," said NC State Chancellor Randy Woodson at the event. "It is a beautiful facility, and it will stand as the testimony to the Kenan family legacy by educating children and adults alike about the Randleigh heritage and the dairy industry."

In addition to cutting the ribbon to open the museum, participants also broke ground on a new Dairy Education Center and Creamery that will feature NC State's popular Howling Cow ice cream.

College of Agriculture and Life Sciences Dean Richard Linton describes the Lake Wheeler Road Field Lab – where the museum, education center and creamery are located – as a "farm of the future."

"This is not only a classroom and laboratory, but also an agritourism destination that will demonstrate the future of agriculture to school children, policy makers and the public," Linton said.

In the 1920s, William R. Kenan, Jr., established his Randleigh Farm in Lockport, New York. He was passionate about animal husbandry, cattle diseases and development of a clean milk supply. He hosted seminars for dairy producers and demonstrated modern dairy practices to the public. Kenan bequeathed his farm and the Randleigh Jersey herd to the University of North Carolina System, along with an endowment to benefit agricultural education.

The Jersey cows grazing at NC State's Lake Wheeler Dairy Farm are the progeny of the Randleigh herd, and Kenan's bequest has been the cornerstone of the farm and dairy facilities here today – and the research and teaching they support.

"We are grateful for the Kenan family's legacy to the university and vision in establishing the Randleigh Dairy Heritage Museum," Linton said. "This is the future of dairy education."

Gary Cartwright, director of the NC State Dairy Enterprise System, agrees.

"This is truly another beginning – the beginning of educating the people of the Triangle, North Carolina and the Southeast about dairy, Jersey cows and the significant contributions made to this industry by the Kenan family."

We transform challenges into opportunities that benefit everyone.

And So It Begins

Reid Smith, Gary Cartwright, Chancellor Randy Woodson, Tom Kenan, Bob Clayton, Dean Richard Linton, K.P.Sandeep and Alex Ives cut the ribbon to open the new Randleigh Dairy Heritage Museum.

NC STATE'S RODOLPHE BARRANGOU ELECTED TO NATIONAL ACADEMY OF SCIENCES

Rodolphe Barrangou, Todd R. Klaenhammer Distinguished Scholar in Probiotics Research and professor of food, bioprocessing and nutrition sciences at North Carolina State University, has been elected into the National Academy of Sciences, one of the world's most important and influential scientific societies.

Barrangou becomes the ninth current NC State faculty member to be elected into the august scientific society. He is one of 84 new members and 21 foreign associates elected this year.

Barrangou focuses on understanding the genetic basis for health-promoting and fermentative properties of beneficial bacteria used in foods. A pioneer in the discovery of the adaptive bacterial immune system known as CRISPR, Barrangou has shown that CRISPR systems defend bacteria against unwanted invaders such as phages. Barrangou is mostly concerned with CRISPR-Cas systems that use Cas proteins as scalpels to cleave away foreign DNA. Possible applications include genome editing, antibacterial and antimicrobial production, food safety, food fermentation and plant breeding.

While working at Danisco, a food ingredients company now affiliated with DuPont, Barrangou and colleagues published a seminal CRISPR paper in the journal Science in 2007. That paper showed that CRISPR is an adaptive immune system that can acquire genetic snapshots of bacterial virus attacks.

Barrangou has received numerous prestigious honors for his work on CRISPR systems. He received the NAS Prize in Food and Agriculture Sciences earlier this year, the NAS Award in Molecular Biology in 2017, the 2016 Warren Alpert Foundation Prize and the 2016 Canada Gairdner International Prize.

Rodolphe Barrangou is NC State's newest member of the prestigious National Academy of Sciences. Photo by Bill Baverstock.

Barrangou is the editor-in-chief of The CRISPR Journal, a peer-reviewed publication that brings together researchers and practitioners in a wide range of disciplines, including genetics and genomics, cell biology, immunology, infectious diseases, microbiology,
molecular biology, neuroscience, plant biology, ethics and law.

He has authored or co-authored more than 120 peer-reviewed publications and is credited with more than 40 issued and pending patents.

Barrangou joined the NC State faculty in 2013. He received the 2014 NC State Alumni Association Outstanding Research Award and the 2015 NC State Faculty Scholars Award. He has been on the Thomson Reuters Highly Cited Researchers list since 2014. Barrangou is a co-founder of both Intellia Therapeutics and Locus Biosciences.

Barrangou earned his bachelor's degree in biological sciences from the Rene Descartes University in Paris, France; a master's degree in biological engineering from the University of Technology in Compiegne, France; a master's degree in food science and a Ph.D. in genomics from NC State; and a MBA from the University of Wisconsin-Madison.

The National Academy of Sciences is an honorific society of distinguished scholars engaged in scientific and engineering research, dedicated to the furtherance of science and technology and to their use for the general welfare. Academy membership is composed of approximately 2,380 members and 480 foreign associates.

NC State also has 17 current members of the National Academy of Engineering and one current member of the National Academy of Medicine.

Read *The CRISPR Whisperer:*
go.ncsu.edu/crispr-whisperer

STUDENT SPOTLIGHT: ON THE PATH TO DENTAL SCHOOL

Amelia Wilson perches on a bench just inside the entrance of the Todd Road Head Start Center in Knightdale, North Carolina, holding a Play-Doh toy and a tangle of plastic necklaces. She's a curious sight for the children walking into school clutching the hands of their parents and caregivers.

The preschoolers approach cautiously. Amelia smiles broadly, welcomes them over and greets the grown-ups. Then the fun begins.

With Amelia's help, the children get to become dentists, building doughy teeth, then drilling and extracting them with plastic toy dental tools. All the while, Amelia is talking with them and their parents about what it's like to go to the dentist and the importance of dental health.

At the end of each session, the children get to choose a necklace – red, green or pink – with a little capsule that will hold a lost tooth. They walk away smiling, proud of their new knowledge – and clearly delighted with the new treasure hanging around their necks.

A master of nutrition student in the Department of Food, Bioprocessing and Nutrition Sciences, Amelia visited the Head Start center several times during the spring semester. And she's planning more visits in the fall, plus an extended educational session for parents. It's all part of her goal to become a dentist.

Why did you choose to pursue a master of nutrition degree?
I chose that path because I eventually want to be a dentist. So I think by getting my master of nutrition I'll be able to bridge the gap that seems to be present between this idea of overall health and wellness related to nutrition and our teeth.

What made you want to become a dentist?
It was a lot of things: My mom is a nurse, so I grew up in the hospital, and she passed down to me this love of taking care of others, and dentistry is very much a service job, so I think I got that from her. But I also grew up taking dance lessons from the age of four, and then I have my dance minor from NC State. And it gave me this attention to artistry and aesthetics, and dentistry is very much about that as well, whether you're doing veneers or whatever it is, it's very visual. And once again, I'm passionate about nutrition, and I think there is a big gap there, so I'm not sure how I want to tie that into my practice as a dentist.

How did you get involved with Head Start?
In my program, you can create or do research or any kind of project that you want to make out of it. So I knew that my advisor, Dr. Goodell, worked hand-in-hand with Head Start, and I asked her if there was anything related to dentistry that I could do there. She encouraged me to create oral hygiene lessons for parents and children. The semester kind of took off from there.

What's the most important thing that you want to accomplish? Is it the focus on the child, or the parent, or both?
I would say the focus on the parent. I've learned in my studies here at NC State that parents are the gatekeepers and are very much so involved with being positive role models. If a child watches their parent floss and brush twice a day, then they're more likely to do it. So I'm trying to … remind the parents that it's important for them to take care of their teeth as well while also guiding the child and hopefully turning on a little spark for them.

What's your favorite part?
My favorite part is seeing kids get excited about taking care of their teeth, for sure. Because I feel like that age it's like they are still formative and happy about it, and I can make it into a game. I also work as a predental intern for an orthodontist, so as you can imagine that's a lot of teenagers, and they just don't want to take care of their teeth at all. But just seeing the kids excited to take care of their teeth is gratifying.

Tell me how your experience at NC State has helped prepare you for your career?
This past semester with Dr. Goodell I took life cycle nutrition, and we talked a lot about parenting practices. The thing that's related to nutrition that I think is also very similar to dentistry is behavioral modification, and that's something very difficult to change. So learning positive parenting practices and how to engage children is, I think, the biggest thing that I've learned regarding dentistry. And just how important the psychology behind health is.

What advice would you give someone who might want to follow in your footsteps?
Look at the prerequisites early. And navigate the resources that NC State gives you, because NC State gives you every resource that you would need to be accepted to dental school.

NEW FUNDING, NEW LEADER AND NEW NAME FOR NEW FOOD PROCESSING LAB

Progress on a hub to advance plant-based food science and manufacturing in North Carolina continues apace, with a new name, new funding and a new leader.

The NC Food Innovation Lab, formerly known as the North Carolina Food Manufacturing and Processing Center, is expected to open its doors on the North Carolina Research Campus in Kannapolis in 2019.

Designed to revolutionize food processing and manufacturing in North Carolina, the one-of-a-kind lab is an initiative of NC State University, the N.C. Department of Agriculture and Consumer Services, the Economic Development Partnership of North Carolina and the research campus.

Dr. Bill Aimutis, one of the nation's most experienced and respected food scientists, joined NC State's Department of Food, Bioprocessing and Nutrition Sciences earlier this year to lead the initiative.

An adjunct associate professor at Purdue University, Aimutis most recently served as a research fellow and global director of external innovation for Cargill Inc.

"This center will provide unique food processing capabilities for both entrepreneurial and established companies to more rapidly launch new consumer products," he said. "It will also serve as a unique real-time food processing facility to validate new processes and equipment being developed."

Major funding for the project has come from North Carolina's General Assembly and the Golden LEAF Foundation. The latter gave $2.2 million to purchase equipment. Dan Gerlach, the foundation's president, said that grant was an investment that will lead to new, good-paying jobs in the state's rural communities.

The NC Food Innovation Lab was born from a 2014 legislative economic feasibility that estimated a potential gain of 38,000 jobs and $10 billion in additional state revenue if the state's food processing and manufacturing industry was expanded. Right now, roughly 80 percent of crops and livestock raised in North Carolina are shipped out of state for processing.

The Kannapolis facility will be one of the only university-based innovation labs designed and built with the ability to comply with the U.S. Food and Drug Administration's Current Good Manufacturing Practices certification. That gives the lab a distinct marketing advantage that will help food entrepreneurs and manufacturers more quickly formalize production-ready recipes and new product introductions.

To learn more about the North Carolina Food Innovation Lab, visit http://go.ncsu.edu/fpmi.

FROM BALLET TO BIOPROCESSING

Elice Kitchen-McKinley started dancing at the age of 9 at the Ithaca Ballet in New York. By 14, she had left home to attend the top school in the nation, Central Pennsylvania Youth Ballet, launching a prolific career with two different companies and countless performances all over the country.

Elice hung up her pointe shoes at the age of 29 to explore a new passion and carve out a new career in bioprocessing science.

Why did you choose to change careers?
My intention was always to pursue a degree, but ballet came first since the body can only survive the rigors of the profession for so long. I was never sure what that degree would be, but during a year-long injury at age 25 I decided to enroll in online classes at Wake Tech. The other part of my plan was to begin getting college credits under my belt so that when the day came to retire, I would not be starting from scratch. While dancing I discovered the power of nutrition as both the instigator and mender of injury in athletes and decided that this would be my pursuit. As I slowly, one class a semester, checked off general requirements, the time came to take science and math courses. Although this was the moment I feared, I was most excited to finally get to pursue something so different from ballet. I then made one of the hardest decisions of my life. Ultimately, I came to the realization that I … didn't feel that I was growing as a dancer and artist as much as I had the potential to. I realized it was time to go to school, and I was ready to allow other people and experiences into my world.

Why NC State?
I always knew NC State was top in the country for food science … and my chemistry professor at Wake Tech took an interest in my future and pushed me towards NC State. I realized that while I had always been anxious about the pursuit of science and math after being a ballet dancer, I truly loved every bit of what I was learning and actually did well in these classes. What I found so amazing was the intersection and overlap of biology and chemistry, and I wanted to do even more. … I applied to Bioprocessing Science a week before the deadline and crossed my fingers.

What are you studying now?
Studying bioprocessing science ... automatically gives me a minor in biomanufacturing. I'm minoring in food science. At 31, after a lifetime of pursuing passion over money, I'm ready to enter a field where not only do I love what I do, but I will earn a living wage.

What's your career goal?
I felt this degree would open many doors. After just a month here, I've realized I really want to get into gene therapy and/or therapies for genetic disease that have afflicted so many. My father was diagnosed with Multi-System Atrophy in 2012, a neurodegenerative disease. It really puts into perspective what so many people all over the world have to deal with. If I could be on a team that comes up with ways to make life just a little less difficult for those afflicted and the family members who become the caretakers, I would be incredibly honored.

How is your experience in CALS helping prepare you for your career?
As of now, I'm only five weeks into my time at CALS as a non-traditional transfer student. But the resources available have been incredible. I have met with career services for CALS to help with a resume, I have been attending LAUNCH workshops for career development, and every person I reach out to has been extremely kind and willing to give advice.

What have you learned here that you'll take with you when you graduate?
I have learned that networking and connecting is our form of paying it forward. We are all here to learn and make the world a better place. … I hope to be that person who's in a position that allows me to help the next generation achieve their career goals.

In six words or less, what's the best thing about CALS?
The infectious passion each professor provides!

FBNS IN THE NEWS

From Process to Pint Glass (NC State News):
Dr. John Sheppard and his team are currently working on a testing and analytical service for craft breweries that they hope to roll out in the next year. http://go.ncsu.edu/from-process-to-pint-glass

"Knowable Magazine from Annual Reviews" featured the work of Dr. Lee-Ann Jaykus and her group. The article provides information about NoroCORE's effort to combat and study food-borne norovirus and hepatitis A.: http://go.ncsu.edu/jaykus-norovirus

Olivia Chadwick is featured as an Outstanding December Graduate (CALS News). Chadwick plans to pursue a career in nutrition or continue her education toward a master's degree. She embraces any opportunity to share her message of healthful eating with others: http://go.ncsu.edu/olivia-chadwick

Working With the Game-Changer Known as CRISPR (Graduate School News). NC State doctoral student Katelyn Brandt shares her passion for working on the CRISPR research team: http://go.ncsu.edu/katelyn-brandt

A Recipe for Success (Graduate School News). Ph.D. student **Michael Lloyd** is blending his love of entrepreneurship and functional foods to cook up new products that are both tasty and medicinal: http://go.ncsu.edu/michael-lloyd

FFAR Awards $1 Million Grant (Dr. Ferruzzi, Dr. Lila, and Dr. Kay). Researchers seek to improve the nutritional content of food products: http://go.ncsu.edu/seeding-solutions-grant

Can Blueberries Boost Your Memory (on the "Today Show")? Dr. Mary Ann Lila is featured discussing the health benefits of blueberries: http://go.ncsu.edu/blueberries-benefits

Howling Cow is one of the best-kept secrets in the Triangle (Our State). While the ice cream is important, educating the public and students is a critical component of Howling Cow's mission: http://go.ncsu.edu/best-kept-secrets

'Drill Instructor Without the Yelling' (CALS News). Dr. Keith Harris, who served in the Marine Reserve Corps before becoming the undergraduate coordinator of food science, reveals how his military service influences his teaching style: http://go.ncsu.edu/keith-harris

NC State Celebrates New Museum, Education Center and Creamery (Dairy Herd Management). The Randleigh Dairy Heritage Museum is now open for visitors to learn about life on a dairy farm and the importance of the dairy industry in North Carolina: http://go.ncsu.edu/randleigh-museum-opening

Dr. Sophia Kathariou and her team study how salmonella survives in your snack foods (WTVD). The food industry has controls in place to minimize the risk of salmonella contamination, but there's clearly room for improvement: http://go.ncsu.edu/salmonella-snacks

Learn the Art of 'Cue at Raleigh BBQ Camp (Tar Heel Traveler). Dana Hanson shares the magic of "low and slow" at the NC State Barbecue camp in Raleigh: http://go.ncsu.edu/bbq-camp-video

DEPARTMENT NOTES

Promotions

Dr. Rodolphe Barrangou: Promotion from Associate Professor to Professor

Dr. Lisa Dean: Promotion from USDA Associate Professor to USDA Professor

Dr. Suzanne Johanningsmeier: Promotion from USDA Assistant Professor to USDA Associate Professor

New Faculty/Staff Hires

Ms. Paige Luck was previously a Research Specialist in Dr. Foegeding's Lab. She started her new position as Lecturer in Food Science on June 1. Paige will teach "Introduction to Food Science" (FS 201) and "The Science of Food Preparation" (FS 330). She will also coordinate labs for "Chemistry of Food and Bioprocessed Products" (FS 402) and "Food Microbiology" (FS 406).

Dr. Deepti Salvi, who was an Assistant Research Professor at the Department of Food Science at Rutgers University, joined our department on June 1 as an Assistant Professor in the area of Food Engineering. She has an 80% research and a 20% teaching appointment. She will be initiating research in areas such as non-thermal processing technologies using plasma, UV, and high pressure. She will also teach "Principles of Food and Bioprocess Engineering" (FS 231) and a graduate level course.

Dr. Bill Aimutis, who has more than 30 years of experience working in the corporate and academic settings, joined as the Director of the Food Innovation Lab at Kannapolis on June 22. In this capacity he will be overseeing the daily activities of the facility and working with entrepreneurs and established food industry partners to develop value-added food products.

In Memoriam

Ms. Rachel Thomas passed away Saturday, October 28, 2017. She and her late husband, Dr. Frank Thomas, were strong supporters of our department. She used to attend the Food Science Club Awards Banquet whenever possible and support our students. Her generosity and kindness will be deeply missed.

Dr. Arun Kilara, who was an Adjunct Faculty in our department, passed away on October, 14, 2017. He delivered guest lectures for some of our classes and supported the students in their food product development endeavors.

Faculty and Staff Awards

Dr. Jon Allen was selected to receive the IFT Dairy Foods Division award at the IFT18 Annual Meeting & Food Expo in Chicago.

Dr. Rodolphe Barrangou won the National Academy of Sciences Prize in Food and Agriculture and was elected to the National Academy of Sciences (NAS), one of the world's most important and influential scientific societies.

Dr. Natalie Cooke received the CALS Teacher of Merit Award. She received the inaugural 2018 Commission on Dietetic Registration Faculty Fellowship from the Academy of Nutrition and Dietetics Foundation and passed the Registration Exam for dietitians in August and is now officially a Registered Dietitian.

Dr. Mario Ferruzzi was awarded the General Mills Bell Institute of Health and Nutrition Innovation Award.

Dr. April Fogleman was selected as a university-level recipient of the 2018 Outstanding Teacher Award and will become a member of the Academy of Outstanding Teachers for the duration of her faculty appointment.

Dr. Dana Hanson received the Distinguished Extension-Industry Service Award from the American Meat Science Association.

Dr. Tyre Lanier was recognized at this year's Annual IFT Meeting in Chicago with the Outstanding Service Award of the IFT Aquatic Foods Division.

In recognition of Dr. Rodolphe Barrangou's election to the National Academy of Sciences, the NC State Belltower was lit red on Sept. 5. This was preceded by a reception at Schaub Hall and also the Chancellor's residence.

Dr. Den Truong was honored at the 2018 Annual Meeting of the National Sweetpotato Collaborators Group in Wilmington, NC, with the 2018 National Research Impact Award.

Ms. Ruth Watkins was selected to receive the CALS Safety Award in recognition of her dedicated service to the safety of the college and the u niversity.

Student Awards

Six of our Food Science students (**Memoree Blackmon, Grace DeMers, Lindsey Doring, Lydia Safir, Sonia Su, and Cassidy Whisnant**) were selected to attend the AFA Food Institute in January.

Morgan Caudill won the first place in the MS student oral competition at the 2018 Annual Meeting of the National Sweetpotato Collaborators Group in Wilmington, NC.

Brandon Carter was one of three selected for the 2018 Jim Page Memorial Scholarship. He was presented with a $2,000 scholarship at the ADPI/ABI Annual Conference in Chicago, IL.

Elice Kitchen-McKinley received this year's AgDay Scholarship from CALS.

Daphne Weikart, of Dr. Harris' Lab, was the winner of the NCALS Foundation Board Research Competition this year.

The following FBNS students received Outstanding Research Awards at the Sigma Xi Awards Dinner:

1. **Mario Lopez, Camila Bueno Almeida, Leah Jamison, Joe Mauro, Alexandria Plisko and Brianna Robinson** (mentored by Dr. Keith Harris; Project Title: Cocoa Butter Phospholipids in Dark Chocolate).

2. **Sean Maloney, Kimberly Ha, Risigan Logendran, Elise McDow, Kyle Pennington, Cassidy Whisnant** (mentored by John Sheppard; Project Title: Analytical Comparison of Optimized Conditions for Yeast Fermentation to Create a Kombucha-Like Product versus Traditional SCOBY Fermented Kombucha).

3. **Ashley Samuelson and Nila Veerabagu** (mentored by Natalie Cooke; Project Title: Evaluation of the User Experience of Virtual Reality Conflict Management Training Videos for Nutrition Education).

The CALS Honors Celebration included six seniors from FBNS: **Alex Cauley, Arati Patel, Sonia Su, Samantha Younger, Sarah Nile, and Kati Scruggs.** Each of these students completed the CALS Honors Scholars path, indicating that they devoted at least a year to undergraduate research.

Caitlin Given was recognized as our departmental winner for the Community Engagement Award, **Peter Rizzo** for Research, and **Krupa Trivedi** for Scholarship. **Caitlin Given** was also awarded the overall CALS Outstanding Senior Award for Community Engagement.

Lisa LaFountain received a $2000 IFT Feeding Tomorrow Graduate Scholarship — "Institute for Thermal Processing Specialists MS Degree Scholarship".

Jennifer Fideler received a $2000 IFT Graduate Scholarship.

Hande Ulus was a winner in the American Society of Nutrition's Emerging Leaders poster competition in Boston at the Nutrition 2018 annual meeting.

At the Institute of Food Technologists annual meeting in Chicago, FBNS won big:

Food Science Club (Winner of "Chapter of the Year" competition)

Brandon Carter (First Place, Dairy Foods Poster Competition)

Sofia Feng (First Place, Nutrition Division)

Lisa LaFountain (First Place, International Division Research Poster Presentation)

Carrie-Xiao Qiu (Third Place, Fruit and Vegetable Products Division Poster Presentation)

Peter Rizzo (Second Place, Dairy Foods Poster Competition)

Angelina Schiano (Third Place, Dairy Foods Oral Competition)

Bryan Wherry (Second place, Dairy Foods Oral Competition)

Alumni Awards

Dr. Jonathan Merkle won the FBNS outstanding alumnus award. He is the Chief Science Officer and Vice President of Science and Technology at Michael Foods.

Dr. Leeann Barden won the FBNS outstanding young alumna award. She is currently the Research Manager at RxBar.

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