



FROM AN INTEREST IN FOOD TO RESEARCH AND DEVELOPMENT

Right: Lauren Davis

Lauren Davis (née Gemar) is a research and development scientist at **General Mills** in Minneapolis. Lauren received both her bachelor's and master's degrees from the **Department of Food Science and Technology** at UNL.

Originally from Sutton, Nebraska, Lauren gained her interest in food science from her mother, a food and nutrition teacher. Lauren stated her mother, "got me interested in cooking and learning about foods at an early age. As I grew older I really enjoyed the science behind how different food products were made and how the human body used and reacted to food. This interest was piqued when I found out that 'food science' combined two of my favorite interests and was a potential career opportunity. Since then I have never looked back!"

Lauren chose to attend UNL due to the strong food science program. "My love for the 'science of food' was fulfilled with what UNL's program had to offer. I was also interested in a smaller program that allowed more faculty/student research and learning. UNL definitely offered the potential for me to explore my interests and the strong faculty and research spoke for itself."

Lauren received her bachelor's from UNL in December 2008 and, advised by **Dr. Robert Hutkins**, received her master's in December 2010. "As an undergraduate I researched prebiotics and their ability

to be utilized by different bacteria species in the human gastrointestinal tract. My undergraduate research was supervised by Dr. Robert Hutkins. This research eventually developed into a graduate research project focusing specifically on the prebiotic Galactooligosaccharides (GOS). Using state of the art technology, 454 pyrosequencing and other techniques, my research revealed that consumption of GOS resulted in a highly specific bifidogenic response in humans. Due to the fact that there is still much to uncover about prebiotics and their effect on the human gastrointestinal tract, this research helped open a door to the potential possibilities that GOS, as a prebiotic, has on the human gastrointestinal microflora."

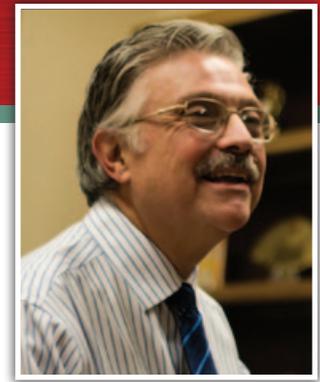
Currently, Lauren works at General Mills as a research and development scientist. "I work within the Progresso Soup group and work to understand ingredients and how they are perceived and liked by consumers. I do a lot of testing of specific ingredients and work to understand what drives liking within consumer groups and how to advance the product with the consumer in mind. Once those understandings are reached, I work on formula development that can then result in a finished product on a shelf near you! I am currently doing research from more of a sensory perspective instead of a test tube perspective, which has been a change. Understanding our company's products



involves a lot of foundational learning and piece by piece dissection of the product. This is a process that involves several professional sensory panels and statistical analyses that I then work to interpret for an outcome that benefits our products and the consumer at the maximum potential."

She concluded saying, "In my current role there is a lot of brainstorming and trial and error. Having my research background and knowing that the 'first time might not always work' has helped me continue to brainstorm at a high level. My position requires a lot of focus and dedication with a lot of repetition. Knowing the properties of different ingredients and their functionality has been a huge help to my success at General Mills. I owe all of this continued knowledge and work ethic to the UNL Food Science program, the research facilities there, and the faculty."

-Matthew Standley



A MESSAGE FROM DR. FLORES

Right: Dr. Rolando A. Flores

Greetings from the Department of Food Science and Technology and The Food Processing Center!

We welcome our newest faculty member, Dr. Amanda Ramer-Tait, who started with us the first week of August. Dr. Ramer-Tait is a specialist in gastrointestinal biology and received a BS in Biochemistry from Western Kentucky University and a PhD in Immunology from Iowa State University. Dr. Ramer-Tait is a specialist in immunobiology and gastrointestinal health.

This semester, Dr. Jens Walter has been providing Food Science and Technology 908J, "Gastrointestinal Microbiology", as a distance-learning course. This class is a sharing activity with other Big Ten universities. Dr. Walter's primary concern has been to give the best class possible for as many students as he can reach. Dr. Walter is also due to be published in the IMSE Journal for research, funded by ConAgra and MAFMA, which shows that whole grain induced immunological improvements are linked to composition of the gastrointestinal microbiota.

Several members of our faculty have recently received grants. Among these are Dr. Wajira Ratnayake for research on incorporating dry-edible beans into noodles for added nutrition, Dr. Devin Rose for research on the health effects of feruloylated arabinoxylan hydrosates, and Dr. Jeyam Subbiah for "Microscopic Raman Imaging to characterize peripheral arterial disease" with partial funding for research on the characterization of electromagnetic interactions with biological materials. More details on these and other grants can be found in the column on page three.

Frito-Lay has announced a major corporate initiative to validate and label their gluten-free products and our Food Allergy Research and Resource Program (FARRP) lab will continue to support Frito-Lay activities through testing and other services. The allergy team has also been receiving recognition for research on the health effects of parvalbumin in fish skin-derived gelatin. This research, conducted by a team which included Dr. Stef Koppelman, Julie Nordlee, Dr. Poi-Wah Lee, and Dr. Steve Taylor, received a prize for an outstanding abstract presentation at the European Academy of Allergy and Clinical Immunology's 2012 Congress and was published in the September 2012 issue of Food Additives and Contaminants under the title "Parvalbumin in fish skin-derived gelatin: is there a risk for fish allergic consumers?"

Dr. Ratnayake took a leading role in organizing the second Sino-US Health and Nutrition Forum which was held in Beijing, China on August 24th, with participation by Drs. Elizabeth Arndt and Devin Rose. Dr. Ratnayake was also key when a reverse trade delegation from China, sponsored by the USDA Foreign Agriculture Service (ATO Office of United States Embassy in Beijing) and Nebraska Department of Agriculture, visited The Food Processing Center on July 2nd. While visiting The Food Processing Center, the trade delegation reviewed Dr. Ratnayake's research on dry-edible bean utilization in noodle processing and held additional discussions on future research collaborations with The FPC and trade partnerships with the State of Nebraska.

The Food Science and Technology Department also hosted another foreign delegation in late July. A group of Taiwanese millers, sponsored by the Nebraska Wheat Board, received instruction on the research being done in Dr. Rose's wheat quality lab and on the milling capabilities of The Food Processing Center. Additionally, the staff of The Food Processing Center and the Dairy Store did an excellent job of hosting visitors from the University Creamery Manager's Association when its annual meeting was held here in July. Jonathan Hnosko, dairy plant manager at The FPC, had served as president of the organization for the past year.

For the 2012-13 school year we had 26 new freshmen in our Department for a total of 78 undergraduates. Several of our students received awards and scholarships from IFT this summer. A list is available on page 4.

This summer, we have used the hiatus to improve our Department's facilities to aid education and research. The Filley Hall 302 classroom has been remodeled with more space, new carpet, new paint, and, soon, with new desks. The autoclave room in 324 Food Industry Complex was totally remodeled with new floors and walls and the installation of a new autoclave unit.

You can find more news on the Department of Food Science and Technology in this newsletter. We hope you enjoy reading and we hope you'll consider contacting us to keep us updated on our alumni.



MASTER'S STUDENT KAYE IVENS

Left: Kaye Ivens

Katherine “Kaye” Ivens is working towards her master’s degree at the University of Nebraska–Lincoln **Department of Food Science and Technology**. She is originally from Newaygo, Michigan, a small town on the west side of the Michigan’s Lower Peninsula.

Kaye initially chose to study food science due to its importance. She stated, “It has immediate implications and global applicability. Research with relevance to a universal need is very rewarding, personally.”

Kaye earned her B.S. in Environmental Biology and Microbiology from Michigan State University in East Lansing, Michigan in December, 2010. She first became interested in the program at UNL while interning at **ConAgra Foods** in summer 2010 where she worked under Dr. Stephanie Gilbreth (née Evans), an alumna who earned her Ph.D. under **Dr. Robert Hutkins**. “My mentor earned her Ph.D. in Food Science at UNL, and I was surrounded by brilliant UNL students. After visiting the UNL program, I was impressed by the dedication of the faculty to students and research. The unique areas of focus within the program gave me many options for pursuing my graduate work.”

At UNL, Kaye has been conducting research in the **Food Allergy Research and Resource Program (FARRP)**, under the supervision of **Dr. Stephen Taylor** and **Dr. Joseph Baumert**. “My research focuses on the effects of fermentation on the detection of milk residues in foods. Because fermentation can be destructive to food proteins, allergens in such products could be harder to detect.”

She added, “I have really enjoyed working with **Julie Nordlee**, the clinical study coordinator within FARRP. She is such a wealth of knowledge and experience; it is great to have her as a resource. Working with Dr. Stephen Taylor and Dr. Joseph Baumert has been wonderful, as they challenge me to become a better scientist. I particularly enjoyed Dr. Taylor’s Food Toxicology course. The case studies of adverse reactions to foods, whether adulterated or not, is extremely interesting to me. The relationship between causation and elicitation of a response to foods, ingredients, and contaminants is not always well understood.”

Kaye doesn’t plan on leaving quickly, “After graduation with my M.S., I hope to continue my studies at UNL, working toward my Ph.D. within FARRP.”

-Matthew Standley

SELECTED GRANTS

Agricultural Research Division

Jeyamkondan Subbiah,
Harshavardhan Thippareddi,
David Jones, Sohan Birla

“Dielectric Measurement System
for Characterizing Electromagnetic
Interactions with Biological Materials”
\$25,000 (4 months)

General Mills

Devin Rose, Jens Walter

“Production of a Ready-to-Eat (RTE)
Oat Cereal with Enhanced Prebiotic
Effects and Sustained Fermentation”
\$80,363 (3 years)

Nebraska Department of Agriculture

Wajira Ratnayake

“Incorporating Dry-Edible Beans into
Noodles to Improve Nutritional Value”
\$15,000 (1 year)

Nebraska Research Initiative

Devin Rose, Jens Walter

“Feruloylated Arabinoxylan
Hydrolysates as Dietary Ingredients
to Improve Blood Lipids and
Gastrointestinal Health”
\$99,919 (2 years)

Nebraska Research Initiative

Jeyamkondan Subbiah

“Microscopic Raman Imaging
to Characterize Peripheral
Arterial Disease”
\$100,000 (2 years)

*If you would prefer to receive your
newsletter electronically, please send your
email address to mstandley2@unl.edu.
The University is trying to find ways to
“go green” and this is an excellent way for
us to do our part. Thank you.*

STUDENTS

STUDENT AWARDS



Above: Right to left:
Dr. Joe Baumert, Kaye Ivens,
Dr. Steve Taylor

Jihan Cepeda Jimenez
IFT Extension & Outreach
Graduate Scholarship

Kaye Ivens
2012 Burdock Group
Student Travel Award

IFT Toxicology and Safety Evaluation
Division Graduate Student Research
Paper Poster Competition –
1st Place

Juliann Kopf
IFT Feeding Tomorrow
Sophomore Scholarship

Erica Marshall
IFT Feeding Tomorrow
Freshman Scholarship

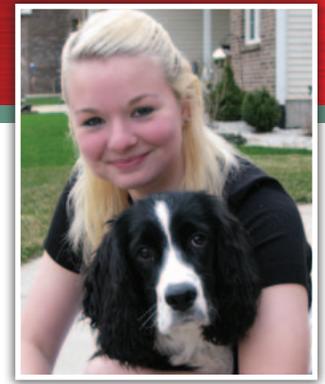
Katy Merckel
IFT Feeding Tomorrow
Junior/Senior Scholarship

Brigitta Santha
IFT Toxicology and Safety Evaluation
Division Graduate Student Research
Paper Poster Competition –
3rd Place

Stephanie Teten
IFT Feeding Tomorrow
Freshman Scholarship

STUDYING ANIMAL NUTRITION FROM THE MICROBE ON UP

Right: Lydia with her dog, Rosie



Lydia Molnar is a sophomore majoring in **Food Technology for Companion Animals** at the University of Nebraska–Lincoln. “I have only been at UNL for a year,” she said, “So far I’ve really enjoyed the intro Food Technology for Companion Animals course. I enjoyed going on the industry tours and applying the information I learned in class.”

Originally from Ankeny, Iowa, Lydia chose to study food science at UNL because “I think nutrition is important for humans and animals. I find food science interesting; I believe it is important to stay healthy. It’s critical to understand how to produce food safely. I have always enjoyed taking science classes and I care about my companion animals. I did a high school visit to UNL, and I enjoyed hearing information about the Food Technology for Companion Animals program. I liked the major because I want to work in the animal science and nutrition industry.”

Lydia has provided assistance in the lab of **Dr. Andrew Benson**, beginning even before she started classes. “It has been beneficial acquiring firsthand experience within a research lab dealing with molecular microbial techniques. I conduct PCR experiments that amplify the 16s rRNA gene. The amplicon products generated from these PCR reactions allow us to classify bacterial species into taxonomic groups through 454 pyrosequencing. Sequence information gained from these studies allows for uncovering information about the microbial diversity in many different host organisms, such as mice and cattle.” She added, “My advisor, **Dr. Wehling** has also been very helpful. He has always taken the time to answer any questions and help with classes. In the summer, I had emailed him asking if he knew of any science related job openings. He ended up helping me get the job working for Dr. Benson.”

She continued, “I have learned more about the companion animal food industry from working with [Recruitment Coordinator] Ryan Kawata. He has helped me get to know more of the Food Science staff and has helped answer any questions I have had. He has also told me about many different opportunities in the **Animal Science** and **Food Science Departments**. I really enjoyed going to the ‘**I Love My Dog Expo**’ and I would not have known about it if he had not told me about it. Because of his help, I am now an officer in the **Food Science Club** and I also am a food science ambassador for the Food Science Department.”

“I have enjoyed all of the opportunities that I have been given as a freshman. I enjoyed going to the IFT trip in Wisconsin, talking to other schools about their food science programs and departments. Going on the trip gave me an idea what other food science programs consisted of and I could compare UNL to other research universities. I also have enjoyed working in a lab and applying information from class into the work field.”

-Matthew Standley

GRADUATES OF THE PH.D. PROGRAM

Ryan Matthew Legge

Dissertation: "Analysis of Microbial Diversity by Amplicon Pyrosequencing"
Dr. Andrew Benson, Advisor

Junjie Ma

Dissertation: "Selection for *Bacillus Cereus* Infection Survival Using *Drosophila Melanogaster*: Investigation of Physiological and Life History Trait Responses"
Dr. Andrew Benson, Advisor

Inés Martinez Ramos

Dissertation: "Host-microbe-diet interplay: Dietary Modulation of the Gut Microbiota in Relation to Health"
Dr. Jens Walter, Advisor

NEW M.S. GRADUATE STUDENTS

Carmen Cano

Dr. Jayne Stratton, Advisor

Pamela Newell

Drs. Rolando Flores and Devin Rose, Advisors

Mallory Suhr

Dr. Heather Hallen-Adams, Advisor

Maricarmen Estrada

Dr. Jayne Stratton, Advisor

Alejandra Ramirez

Drs. Robert Hutkins and John Rupnow, Advisors

Daniel Unruh

Dr. Harshavardhan Thippareddi, Advisor

Liya Mo

Dr. Wajira Ratnayake, Advisor

Luis Sabillon

Drs. Rolando Flores and Jayne Stratton, Advisors

NEW PHD GRADUATE STUDENTS

Shyamali Jayasena

Drs. Joseph Baumert and Stephen Taylor, Advisors

Yuan Jin

Dr. Richard Goodman, Advisor

Junyi Yang

Dr. Devin Rose, Advisor



HELP OTHERS WHO SHARE YOUR HUNGER FOR FOOD SCIENCE.

Donations to the Food Science and Technology Fund are used in scholarships to enhance undergraduate recruitment. To contribute online, go to www.nufoundation.org/foodscience. To learn more, please contact Ann Bruntz, IANR Director of Development, University of Nebraska Foundation, 402-458-1176, or e-mail her at abruntz@nufoundation.org.



DEPARTMENT OF
FOOD SCIENCE
AND TECHNOLOGY





Dr. Devin Rose
Assistant Professor
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Andrés Doblado Maldonado
Graduate Research Assistant

WHOLE WHEAT FLOUR: A FORMIDABLE CHALLENGE

Research by Dr. Devin J. Rose and Andrés F. Doblado Maldonado.

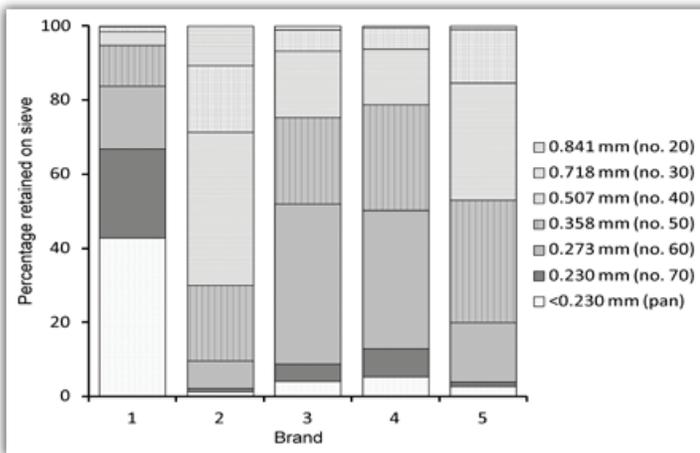


Figure 1. Particle size distribution of five brands of whole wheat flour obtained from a local market; reprinted with permission from Doblado Maldonado et al.⁶ copyright 2012 Elsevier.

Current dietary recommendations are for half of our grain intake to come from whole grain foods,¹ yet Americans only consume about 11% of their grains as whole grains.² Food companies have responded by releasing 3,272 whole grain products in 2010 compared with only 164 in 2000,² resulting in nearly a 3-fold increase in whole wheat flour production over the last decade.³

Using whole wheat flour instead of white flour is more complicated than a simple 1:1 replacement. Two major and unique challenges to using whole wheat flour are milling and shelf life. Kihlberg et al.⁴ noted that milling technique has a greater effect on bread quality than the quality of wheat used for producing the flour or the formulation of the bread itself. Moreover, active lipolytic enzymes in whole wheat flour hydrolyze naturally-occurring lipids in the flour and result in loss of baking quality during even fairly short-term (5 months) storage.⁵ Research efforts in our lab are directed at overcoming both of these issues.

MILLING

When milling whole wheat into flour on modern, commercial mills, the bran portion (outer layer) forms large flakes, rather than shattering into small pieces. Millers use different strategies to

reduce the particle size, which result in flours with very different particle size distributions (Figure 1).

Particle size distribution affects bread quality (Figure 2). Although large bran flakes are undesirable in whole wheat flour because they result in bread with a rough crust and gritty texture,⁷ milling whole wheat flour is more complicated than just milling as finely as possible. On the contrary, compared with coarse particles (>500 μm median particle size), fine bran (<500 μm) has a greater negative impact on loaf volume because “chemical components” (not conclusively identified) in the bran interact more readily with gluten and inhibit development.⁸

Our research efforts are aimed at developing a laboratory method for milling whole wheat flour that can be done in one pass, i.e., does not require separate milling of the bran, and produces flour with ideal particle size distribution. This will allow us to identify experimental wheat lines that are particularly suitable for whole wheat flour production.

SHELF LIFE

Another major challenge to using whole wheat flour is shelf life. Active lipolytic enzymes break down the lipids and lead to reduced flour quality (Figure 3). For instance, lipase releases fatty acids during whole wheat flour storage that can react with baking soda in whole grain baking mixes and result in loss of leavening; free fatty acids are also readily oxidized during the mixing and fermentation stages in breadmaking and result in off flavors, reduced nutritional quality, and reduced sensory acceptability.

Strategies that are commonly used to stabilize lipids in other foods are not effective for whole wheat flour. For instance, modified atmosphere is not effective because degradation of whole wheat flour lipids begins with hydrolytic rancidity, which is enzymatic and does not require oxygen. Addition of antioxidants to whole wheat flour is also not effective because oxidation of fatty acids (generated from lipase activity during storage) in whole wheat flour proceeds rapidly by lipoxygenase when the flour is mixed with water and is not inhibited by antioxidants.¹⁰



Figure 2. Bread made from whole wheat flour milled from 'Overland' wheat with a mean particle size (μm) of (left to right): 135, 147, and 170; loaf volumes are (cm^3): 535, 495, and 443.

Therefore, other strategies to stabilize lipids in whole wheat flour have been employed. Most studies have focused on heat treatments to inactivate lipase. This presents several problems, however, because the heat can initiate autoxidation of the lipids and oxidize other components.^{11,12} Furthermore, the costs associated with implementing heat treatments in a flour milling process are prohibitive in some instances. Other strategies have included pH changes and salt treatments,^{13,14} but these approaches have not been practical.

One of our research goals is to develop new processing technologies or strategies to stabilize the lipids in whole wheat flour without use of heat treatments. This may help prolong the shelf life of whole wheat flour and ease pressures on millers and bakers.

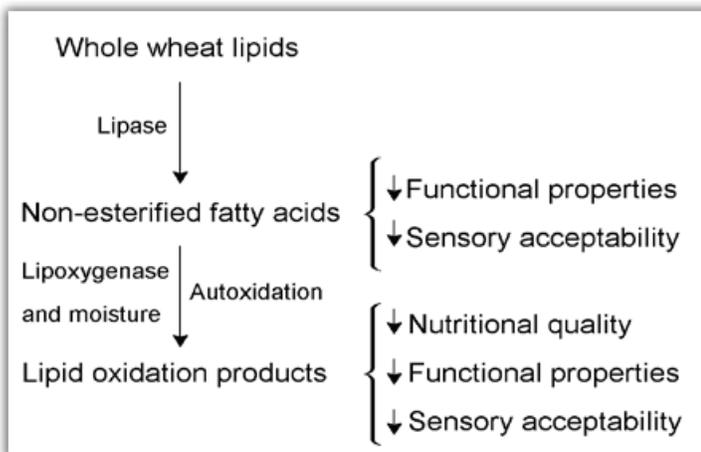


Figure 3. Causes and consequences of lipid degradation in whole wheat flour during storage; reprinted with permission from Doblado Maldonado et al.⁶ copyright 2012 Elsevier.

CONCLUSIONS

Even as dietary recommendations are released for consumers to increase whole grain intake substantially, research on whole wheat flour production and utilization is scarce. In particular, there is a noticeable lack of standardized methods for producing whole wheat flour as well as strategies to improve the quality and flexibility of whole wheat flour. We aim to address these issues to ultimately improve acceptability and consumption of whole grain foods to improve health.

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THE DAIRY PLANT'S CREATIVE SPIRIT

Right: Jonathan Hnosko in front of the Dairy Store.

Ask UNL Dairy Plant Manager Jonathan Hnosko how he comes up with some of the Dairy Store's quirkier flavors, and you might get quite an answer.

With flavors such as White Chocolate Lavender, Peachberry Cobbler, Fuzzy Navel Sherbet and Maple Bacon, some of the ice creams the Dairy Plant churns out each year seem like they were concocted under the supervision of Doc Emmett Brown of Hollywood fame. But Jonathan and his student staff rely on extensive research, customer feedback, good old creativity and even a little detective work to keep taste buds happy.

"When we come up with new recipes, we usually adapt them from established recipes and ingredients that we've used," Hnosko said. "From there, we get feedback one of two ways; either customer feedback — what they would like to see — or employees and their ideas on how to use new combinations."

IT'S ALL IN THE SWIRL

One of the Dairy Store's popular flavors turned the corner for the Dairy Plant staff in developing new frozen treats. In 2009, the staff figured out how to incorporate a variegated, or swirl flavor, into smooth ice cream.



"Brownie Fudge Swirl was our breakthrough. It was our trial run," Hnosko said. "We looked at the storehouse of pipe work and equipment to see if we could pull it off without adding new equipment. It has some limitations, but so far we've been able to run most things through there that we want."

THE JOY OF ALMONDS

Almond Joy debuted in the Dairy Store dip cabinet in July 2012. The plant had coconut flavor from its Piña Colada sherbet and a fudge variegated used in several recipes, so why not add sliced almonds?



"For me, it was my first time using the fudge variegated to put the swirl in," said senior history major John Densberger, a Santa Lina, California, native working a summer job at the Dairy Plant. "It was pretty much a perfect blend of coconut and almond flavor, one didn't overpower the other and the chocolate complimented the blend really well."

Hnosko said the flavors were a natural combination.

"We wanted to do something else than just coconut ice cream," he said. "Almonds and chocolate go with coconut naturally, and sliced almonds in ice cream is just unique. They have firmness to them, but because they're sliced so thin, they crunch up really nice."

"You get the coconut flavor that comes through, plus the visual appeal of the fudge, but for me the big draw is the almonds that are incorporated into it."

DETECTIVE WORK

Some flavor ideas are resurrected by popular demand from customers looking for ice creams they remember from their youth. Such was the case with Orange Velvet, which was served at the Dairy Store as long ago as the 1950s.

But when Jonathan went through the Dairy Plant archives in 2009 looking for clues, he found evidence that it indeed existed but not so much as an inkling of a recipe.

"We interviewed a few people that posed interest in the flavor," Hnosko said. "The name indicated that it had orange, and we thought it was a smooth flavor, but people indicated that it may have had pineapple in it."

So he set to work, incorporating pineapple pieces into an orange flavored ice cream. The moment of truth came when customers compared the new version to the old.

“They said we got it pretty close to what they remember,” Hnosko said. “For a lot of these people it’s a childhood memory, or it was their uncle’s favorite or their brother’s favorite. So that was really cool to see.”

‘CREATIVITY AND ANTI-CREATIVITY’

The hardest part of making new flavors, Jonathan says, is not so much developing recipes, but perfecting them. A flavor can take just days to develop an idea but weeks to turn into a recipe that delivers the same, delicious results in every batch.

“The creativity is set loose (when generating ideas), but after that is making it right,” Hnosko said. “Part of the job is creativity and anti-creativity. It takes a lot of fine-tuning, and that’s where customer feedback is important.”

Jonathan also hinted there are more flavors to come in 2012 but was mum on the details.

“We have a wide customer base and it’s fun because they push us to make sure we don’t get too comfortable,” he said. “It allows us to keep that creativity sharp.”



Tradition and Quality

SINCE 1917

Ninety-five years. That kind of tradition does not happen by chance. The Dairy Store at the University of Nebraska-Lincoln is extremely proud to serve alumni, family and friends our very best ice creams, cheeses and

confections – always handmade with premium ingredients. The next time you’re on East Campus, stop by to discover or perhaps rediscover the best way to get a taste of Husker pride.

Department of Food Science and Technology | The Food Processing Center
 Located at 38th & Holdrege on East Campus | 402.472.2828 | marketplace.unl.edu/dairystore

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FOOD SAFETY AND DEFENSE DISTANCE EDUCATION

Left: Dr. Robert Hutkins

For the last two years, the **Department of Food Science and Technology** at UNL has participated in the **AG*IDEA** program by providing the **Food Safety and Defense graduate certificate program**. The program was developed to provide graduate-level educational training in food safety to professionals charged with protecting the food supply from contamination.

Dr. Robert Hutkins is the faculty coordinator for the program at UNL and also teaches two of the program's courses, Food Microbiology and Microbiology of Fermented Foods. He explained "The entire program is on-line and consists of 12 credits, or about 6 courses, including Food Safety and Security, Food Microbiology, Food Toxicology, and HACCP. Electives include courses in Microbiology of Fermented Foods, Food Law, and Risk Assessment."

The Food Safety and Defense Certificate is part of **Great Plains IDEA** which combines the resources of 11 universities to offer graduate coursework and program options through online and other distributed-learning technologies, with its arm AG*IDEA specializing in agricultural disciplines. Dr. Hutkins explained, "Four universities, UNL, Kansas State University, Iowa State University, and the University of Missouri, are responsible for teaching and delivering courses in the Food Safety and Defense program. Students apply and are admitted to the program via any one of these institutions, which then serves as their 'home school'. The tuition (currently about \$500 per credit) is the same for all students."

The Food Safety and Defense program is proceeding successfully. The program had 19 students in summer 2011, 20 in fall 2011, and 17 in spring 2012. Graduates and current students have worked in the food industry, regulatory agencies, or related fields. In June, Bryan Garton, chair of the AG*IDEA Board of Directors, wrote to thank Dr. Hutkins for his contributions and stated that the quality of the program, "is due, in large part, to the dedication of faculty who not only provide excellent instruction but also advise students, serve on committees, and devote time to collaborating with their AG*IDEA colleagues."

-Matthew Standley

VISITING SCHOLARS

Latiful Bari, a Borlaugh fellow, visited from the **University of Dhaka** in Bangladesh for 3 months and worked in the labs of both Dr. Harshavardhan Thippareddi and Dr. Jeyamkondan Subbiah.

This summer, Dr. Heather Hallen-Adams hosted Ph.D. student **Mmatshepho Phasha** of the **University of Pretoria South Africa** and **Rhaisa Crespo**, an intern from the **University of Puerto Rico in Mayagüez**.

Hatem Kittana will be in the Ramer-Tait lab through the end of this year studying how host-microbial interactions influence gastrointestinal health and disease. Hatem is a teaching assistant at **South Valley University** in Qena, Egypt where he received his veterinary degree.

Undergraduates **Ren Xiao Meng** and **Wu Yuchen**, both from **Northwest Agriculture and Forestry University** in China, interned with Drs. Andréia Bianchini and Jayne Stratton. Also from Northwest Agriculture and Forestry University, **Yongbo Ding** worked with Dr. Harshavardhan Thippareddi.



Left to Right: Yongbo Ding, Dr. Andréia Bianchini-Heubner, Robin Krokstrom, Jonathan Hnosko, Ren Xiao Meng, Wu Yuchen, Dr. Jayne Stratton, Lakshmi Gompa, and Bismarck Martinez



DR. AMANDA RAMER-TAIT JOINS FOOD SCIENCE FACULTY

Left: Dr. Amanda Ramer-Tait

Dr. Amanda Ramer-Tait is the newest member of the **Food Science and Technology** faculty.

Originally from Cecilia, Kentucky, Dr. Ramer-Tait first became interested in the immune system as a child on her family's cattle farm. "I remember being very curious about why some of our animals became sick but others remained healthy. I was also fascinated with the concept of vaccinating an animal to prevent disease. Many years later in college, I took an immunology course. I knew then I had found an area of study to match my interests."

Dr. Ramer-Tait received her bachelor's degree in Biochemistry with a minor in Agriculture from Western Kentucky University in Bowling Green, Kentucky, in 2000. She went on to earn a Ph.D. in Immunobiology at Iowa State, University in Ames, Iowa, in 2006. At Iowa State she served as a post-doctoral associate in a molecular parasitology laboratory until 2008 and then joined a mucosal immunology laboratory at Iowa State as an associate scientist. She stated, "During that time, my research interests shifted to understanding how host-microbial interactions, including gastrointestinal infections, contribute to the pathogenesis of inflammatory bowel disease (IBD), including Crohn's disease and ulcerative colitis. Over the years, my research has centered on understanding the relationship between host immune responses and the evasion strategies used by pathogens to establish successful infections in their hosts. I now utilize my knowledge of both immunology and microbiology to gain new insights into the maintenance of gastrointestinal health and homeostasis."

Dr. Ramer-Tait was interested in UNL for the research and resources already established. "I was very excited by the many collaborative opportunities within the **UNL Gut Function Initiative**. The efforts of this group are a tremendous complement to my research program. I was also impressed with the program's vision for a new gnotobiotic mouse facility. Once completed, this state-of-the-art facility will be one of the best in the country and a tremendous asset for studying host-microbial interactions in the gut."

On her new role, Dr. Ramer-Tait said, "My position at UNL will involve both research and teaching. I am excited

to have the opportunity integrate my passions for research and learning, both in the classroom and the laboratory. My research is about developing and exploiting a simple model for a complex disease. Even though IBD affects approximately one in every 300 individuals in the U.S., this long-term disorder of the gastrointestinal tract is still poorly understood. In fact, an overarching question is how much of IBD arises from our own DNA, or genes, and how much results from interactions with the microbes living in our intestinal tract, such as the long-term residents that colonize shortly after birth or the ones recently acquired from the environment? Numerous reports indicate that both factors, and maybe even a complex interaction between the two, are important. My lab focuses on the microbial causes of IBD. Specifically, we are studying the microbiota present in the gut shortly after birth and seeking to define their role in exacerbating gut inflammation after a mild, environmental trigger of disease. Until now, defining the role of the resident microbes in the inflammation of IBD has been daunting. This is because the gut contains more than 10 billion organisms per gram of contents representing over 1,000 bacterial species. This comprises a highly complex ecosystem. To reduce complexity, we employ mice with a highly simplified microbial community called the ASF, short for altered Schaedler flora, named for the person who pioneered their use in mice. The gut of an ASF colonized mouse contains only eight microbes, and this simplicity provides an ideal system for understanding how the host interacts with its microbes to either maintain health or cause disease. Knowing more about the role of the microbes present in the gut will help us, down the road, identify biomarkers for disease susceptibility and develop dietary interventions, including prebiotics, probiotics and nutraceuticals, to modulate the resident microbiota as a treatment for IBD."

"Everyone has been quite welcoming and many of the Food Science faculty members are ready to include me in projects," she said, "I am very grateful for these opportunities!"

-Matthew Standley

CONFERENCES & WORKSHOPS

2012 FPC Extrusion Workshop	October 30-November 1, 2012 – Lincoln, NE
Better Process Control School	November 3, 2012 – Lincoln, NE
Food Entrepreneur Program Seminar	November 3, 2012 – Lincoln, NE
Better Process Control School for Acidified Foods	April 8-10, 2013 – Lincoln, NE

ONLINE REGISTRATION AVAILABLE AT FPC.UNL.EDU

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