



Amanda Ramer-Tait



### Education, experience leads FDST alum to C.W. Brabender

Less than three years after graduating with a Bachelor of Science degree from the University of Nebraska-Lincoln Department of Food Science and Technology, Kristen McCarty was hired by C.W. Brabender® Instruments in Hackensack, N.J., as laboratory manager of the Food Characterization Lab for the U.S. and Canada.

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### Research focuses on combating obesity and metabolic diseases

Obesity and its related diseases, including type 2 diabetes, coronary heart disease, metabolic syndrome and some cancers, currently are considered by many to be the leading health problems in this country.

The prevalence of obesity has increased more than 75 percent during the last 30 years, and more than half of the population of the United States is considered overweight.

Amanda Ramer-Tait, assistant professor in the Department of Food Science and Technology, and her team are doing research that they hope will provide new knowledge and treatment strategies for obesity and metabolic syndrome.

“The increase in obesity cannot be explained by genetics alone, because human genetics have not changed in the last 50 years,” she said. Instead, environmental, social and behavioral factors are now considered the main contributors.

Excessive caloric consumption and a lack of physical activity contribute significantly to the obesity epidemic, but, Ramer-Tait said, “There is a growing appreciation for the role of other environmental factors in the increase of obesity and metabolic diseases, including the microbes residing

in your gastrointestinal tract, known collectively as the gut microbiota.”

Comprising a complex community of more than 100 trillion bacteria, gut microbiota members outnumber

***“The increase in obesity cannot be explained by genetics alone, because human genetics have not changed in the last 50 years.”***

– Amanda Ramer-Tait


human cells ten-fold. These symbiotic organisms are an integral part of the human body. They provide humans with dietary metabolites, protection against pathogens and a fully developed immune system. However, this community and its functions can be altered by a variety of factors that cause a microbial imbalance known as dysbiosis.

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


We hope your summer included some relaxation and rejuvenation. The start of the fall semester is a special time for us. It's always exciting to begin the academic year.


We extend a special welcome to the new students. We have 23 incoming freshmen and transfer students for a total of 71 undergraduates in our department.


And we welcome Jennifer Clarke, who is director of UNL's Computational Science Initiative. Clarke, who has appointments in both the Department of Food Science and Technology and the Department of Statistics, will be working with the Gut Function Initiative and other research projects. [Read more about her on page 3.](#) 


In addition to Clarke, we are hiring three new faculty in food safety risk assessment, food lipids chemistry and functionality, and food allergens risk assessment. Ozan Nazim Ciftci, who will start his duties on April 1, 2014, will be working in the area of food lipids chemistry and functionality. We'll tell you more about him and the numerous projects of the department and The Food Processing Center in the spring 2014 newsletter.

Assistant Professor Amanda Ramer-Tait is researching how the microbes in the human gastrointestinal tract regulate immune responses and contribute to the development of obesity. [Learn more about her research on page 1.](#) 

Katie Hilgren, a senior food science major, is the new president of the Food Science Club. [Read about her plans for the club on page 8.](#) 

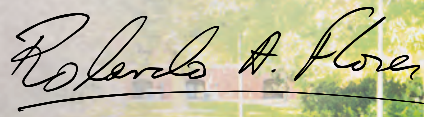
Maria Quintero, a doctoral student, is studying prebiotic compounds and how they affect bacterial growth in food. [Read more about this project on page 7.](#) 

Alumna Kristin McCarty works for C.W. Brabender® Instruments in Hackensack, N.J., as laboratory manager of the Food Characterization Lab for the U.S. and Canada. [Read more about her career on page 1.](#) 

The holidays will be here soon. If you are thinking about that person who's always hard to buy for — or anyone else on your holiday shopping list — a cheese box from our Dairy Store might be the perfect gift. [Check out the gift box options on page 4.](#) 

We hope you will enjoy reading more about the Department of Food Science and Technology and The Food Processing Center in the rest of this newsletter.

Best wishes,



Rolando A. Flores

Head, Department of Food Science and Technology  
Director, The Food Processing Center



FALL 2013  
VOLUME 9, ISSUE 2

The Department of Food Science and Technology and The Food Processing Center Alumni Newsletter is published three times a year by the Department of Food Science and Technology and The Food Processing Center in the Institute of Agriculture and Natural Resources at the University of Nebraska-Lincoln under the auspices of the department head.

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## LET US KNOW WHAT YOU THINK!

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

# Clarke developing resources for 'big data' research projects

Much research done at the University of Nebraska–Lincoln these days requires what scientists call “big data” — huge amounts of quantitative and qualitative information that must be sorted, stored and analyzed. Jennifer Clarke came on board Aug. 1 as director of UNL’s Computational Sciences Initiative to help colleagues manage that.

Clarke said the initiative is a UNL-wide effort to develop resources for big-data research projects. That includes everything from infrastructure — software and hardware — to human resources. Her role is to assist with existing research projects and also promote future research in computational sciences.

“Big-data research is research that’s involving large enough data that it’s in some sense pushing the boundaries ... analytically or computationally,” said Clarke, who has joint appointments in the Departments of Food Science and Technology and Statistics.

The Gut Function Initiative is one example of the research projects in which Clarke will play a role.

Clarke was at the University of Miami from 2007-2013 and at Duke University before that. She received undergraduate degrees in math and psychology from Skidmore University, a master’s in statistics from Carnegie Mellon and a doctorate in statistics from Penn State.

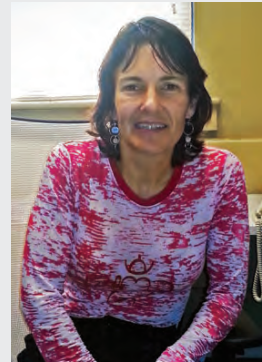
The UNL job appealed to her because “there’s a recognition by the university and IANR in particular that big data is important, that it’s an area which has become relevant to lots of different disciplines.”

There are numerous significant research projects and research groups at UNL that are intriguing too, she said. Clarke also noted a strong interest in developing educational programs to prepare students to deal

with big data. She will begin teaching a statistics course next semester and perhaps others later.

As both a teacher and researcher, Clarke is eager to promote STEM (science, technology, engineering and math) disciplines to young people,

**“THERE’S A RECOGNITION BY THE UNIVERSITY AND IANR IN PARTICULAR THAT BIG DATA IS IMPORTANT, THAT IT’S AN AREA WHICH HAS BECOME RELEVANT TO LOTS OF DIFFERENT DISCIPLINES.”**



**Jennifer Clarke**

especially women, whose numbers typically lag behind men’s in these fields.

“I would like to get more women into information sciences, math and engineering, to see the whole STEM area as attractive and interesting.”



## *The Holidays are Right Around the Corner*

The cold days of fall and winter are fast approaching, but it’s never too cold to stop in and enjoy the delicious ice cream you remember from your days on campus.

While you’re here, you can pick up a brochure for your holiday cheese box order. If you can’t make it to East Campus, take some time to visit our website and we’ll send your order directly to you.

The Dairy Store | [dairystore.unl.edu](http://dairystore.unl.edu)

Department of Food Science and Technology | The Food Processing Center

Located at 38th & Holdrege on East Campus | 402.472.2828 | [marketplace.unl.edu/dairystore](http://marketplace.unl.edu/dairystore)



## Dairy Store cheese boxes make great holiday gifts

Looking for a terrific holiday gift?

The Dairy Store, part of The Food Processing Center, offers several cheese boxes, each with unique flavors of cheese. All cheese is made in The Food Processing Center with milk from dairy farms across Nebraska.

Try the Cornhusker gift box, complete with 1/4 pound of New York cheddar, sharp cheddar, smoke cheddar, Husker tomato basil, Husker, Husker spinach and artichoke, Husker jalapeno and Husker-N-Gold. Husker-N-Gold is a yellow-and-white marbled cheese produced from a mixture of Husker and Colby cheeses.

Or, if you like meat and crackers with your cheeses, try the Varsity box, which has seven varieties of cheese, two packages of gourmet crackers, 1/2 pound of summer sausage, 1/2 pound of cooked salami and 8 ounces of honey.

Nebraska baskets are packaged in an attractive red gift box or a handcrafted Nebraska-shaped basket. Last year, the Dairy Store sold 4,555 boxes of cheese. Orders can be picked up or shipped to your desired location. You may place an order by going to [marketplace.unl.edu/dairystore](http://marketplace.unl.edu/dairystore) or by calling the Gift Box Hotline at 402-472-2951.

“Diet has a tremendous impact on the composition of intestinal microbes, which can profoundly impact immune response and overall health. For example, obesity is associated with microbial dysbiosis in both mice and humans,” Ramer-Tait said.

Research in her laboratory focuses on how the dynamic relationship between diet and the gut microbiota can influence immunological and metabolic health. To study these complex relationships, her team takes advantage of a unique resource, the UNL Gnotobiotic Mouse Facility.

Gnotobiotic (from the Greek words *gnotos* meaning “known” and *bios* meaning “life”) mice are housed in flexible plastic isolators and fed only sterile food and water to maintain strict control over the composition of their intestinal microbes. The gnotobiotic mice can be kept “germ-free,” meaning their gut is completely devoid of any microorganisms. They can also be raised with a defined number of bacteria to alleviate some of the challenges that come with studying a complex microbial community.

“Gnotobiotic mice have played an important role in understanding the relationships among gut microbes, diet and our well-being,” Ramer-Tait said. The causative role of the gut microbiota in

obesity and type 2 diabetes has been established using germ-free mice, which are resistant to diet-induced obesity. However, gut microbes from obese mice can induce fat deposition and insulin resistance when transplanted into germ-free recipients.

Obese mice fed high-fat diets also have increased levels of lipopolysaccharide, a component of bacterial cells, in their serum because of increased intestinal permeability — “leaky” intestines that permit the passage of bacterial products from the gut to other organs via a process called bacterial translocation. Together, changes in the composition of the gut microbiota and bacterial translocation unnecessarily activate the immune system and cause it to attack healthy cells, ultimately leading to inflammation and unintended damage throughout the body, Ramer-Tait said.

“Harnessing the ability to modulate the gut microbiota and host immune responses, potentially via dietary intervention, promises to be an exciting and effective strategy for controlling obesity and metabolic diseases,” she said.



## Alumnus Kenny Soejoto to serve as FPC advisory board chair

Kenny Soejoto, president of American Laboratories Inc. in Omaha, will lead the Advisory Board for The Food Processing Center for the 2013-2014 year.

Soejoto has been in the pharmaceutical and human nutrition industry for more than 35 years in various operations and sales/marketing positions.

Soejoto learned about The FPC Advisory Board formation during a trip to Japan in 2006 where he met Rolando Flores, department head of food science and technology and director of The Food Processing Center. There he learned of the creation of the board and has been involved with it since its inception, representing usage of pork and beef tissues, which are by-products in the slaughtering and harvesting process.

American Laboratories Inc. is a processor and manufacturer of enzymes and proteins from pork and beef tissues that are used in the pharmaceutical, nutritional, food, veterinary care and diagnostic industries.

The FPC Advisory Board meets in the spring and fall each year.

Since becoming more involved with The FPC through the board, Soejoto has learned more about it and how American Laboratories Inc. can work with The FPC.



*Kenny Soejoto*

To date, American Laboratories Inc. has worked with some of the projects, donated laboratory equipment, enrolled personnel in The FPC's various programs and utilized the microbiological lab.

"Reaching out to companies, no matter what size, is important for The FPC's growth and they are meeting that challenge," Soejoto said. "Dr. Flores assembled and continues to have a diverse advisory board that includes companies small and large, and Nebraska-based as well as national and multinational companies, such as Prairieland Dairy, Oxbow, Nestle Purina and ConAgra Foods."

Soejoto said the education for undergraduates, graduate students and post doctorates is enhanced by their interactions with the Advisory Board member companies as well as others in the industry.

"And, as experienced by American Laboratories Inc., these interactions are very beneficial for the industry," he said.

## Selected Grants

**Wajira Ratnayake and Devin Rose** – \$35,984 from Nebraska Dry Bean Commission for a project titled "Improving Dry-Edible Bean Utilization in the Food Industry: Developing New Ingredients and Products from Milled and Separated Fractions of Great Northern Beans."

**Andreia Bianchini, Harshavardhan Thippareddi, and Jeyam Subbiah** – \$799,970 from the National Strategic Research Institute (NSRI) for a project titled "NSRI Microbial Field Forensics."

**Andreia Bianchini and Jayne Stratton** – \$63,029 from University of Idaho for a project titled "Risk Assessment and Intervention Strategies for the Emerging Food Safety Threat of Ochratoxin A in the U.S."

## Visiting Faculty and Scholars

Dr. Xiao Song Hu of the China Agricultural University, July 17 -21.

## Conferences and Workshops

**Better Process Control School**  
October 1-3, 2013 – Lincoln, NE

**Extrusion Workshop**  
October 15-17, 2013 – Lincoln, NE

**Food Microbiology Workshop**  
March 25-26, 2014 – Lincoln, NE

Online registration available at  
**FPC.UNL.EDU/TRAINING**

## Education, experience leads FDST alum to C.W. Brabender®

(continued from page 1) 

C.W. Brabender® Instruments develops and manufactures testing equipment for polymer and food industries worldwide.

McCarty took a diverse path to the degree she received in 2010; she majored in Biological Systems Engineering during her first two years at UNL. When she moved into a Food Science and Technology major, she already had a basic understanding of technology. She was able to build on those basics through coursework and through working with Michael Zeece, professor of food science and technology, including work in the Food Chemistry/Food Protein laboratory under Zeece's direction. That led to a trip to Ireland to work with other food science students from the University of Cork. McCarty believes that

experience, as well as an engineering study trip to Italy, helped her to land the job with C.W. Brabender®.

McCarty credits UNL with providing her with educational and work experiences, including UNL Biological

Systems Engineering faculty Milford Hanna and Curtis Weller, and Food Science and Technology faculty Devin Rose, Randy Wehling, Jayne Stratton, Zeece and Rolando Flores, head of the Department of Food Science and Technology.

In her work today, she is in charge of day-to-day testing, as well as specific studies for customers. Also, any time there are projects that concern



**Kristen McCarty**

different instruments, she leads the projects, including technology methodologies and instrument demonstrations at seminars, and travels to train users of the instruments.

**"IT IS COMMUNICATING SO YOU CAN BE UNDERSTOOD," SHE SAID, ADDING THAT COMMUNICATION BASED ON RESPECT, TRUST, COMMITMENT, MOTIVATION AND MORALE EQUALS TEAMWORK AND SUCCESS.**

McCarty worked for ConAgra Foods in Texas and Illinois before making the move to C.W. Brabender®. Her time with ConAgra included a strong mentoring program during which she was "set up to succeed," she said.

"I had a really strong mentor with ConAgra," she said. "I trusted him right away." Her mentor volunteered her for things that were outside her comfort zone, but was beside her to help her to succeed at new tasks. She joined the new Network of Executive Women; she received fundamental training about flour and technology. She was put into situations in which she had the chance to work with people with many years of experience.

In the years she has been in the workforce, McCarty not only has been able to work in technology and food processing; she has learned the best ways to communicate with co-workers and customers, even when there are language barriers. It is easier to communicate if you have a relationship with an individual, she said, but added that relationships must be cultivated. In her work, she communicates in different ways with sales managers, customers, colleagues, and in training situations, depending on what each needs to know.

"It is communicating so you can be understood," she said, adding that communication based on respect, trust, commitment, motivation and morale equals teamwork and success.

## Student Awards

### Undergraduate UNL Chancellor's and Regents Scholarships

Colleen Melvin  
Shannon Rezac  
Melanie Heermann  
Elizabeth Rice

### IFT Feeding Tomorrow Scholarship

Hannah Kesterson  
Erica Marshall  
Colleen Melvin

### Graduate Henningsen Graduate Student Fellowship

Lin Li

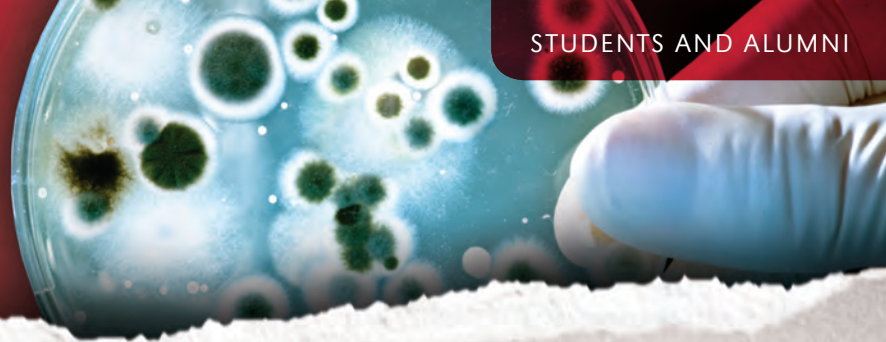
### Widaman Trust Distinguished Graduate Assistant Award

María Maldonado-Gomez  
Juny Yang

### American Dairy Science Association

Maricarmen Estrada – 2nd Place in  
student oral presentation

# Doctoral student studying prebiotic compounds to improve human health



Maria Quintero wants to find out how prebiotic compounds can prevent people from getting sick.

Quintero, 28, is a Ph.D. student in the Department of Food Science and Technology. She has been working on a project that aims to study prebiotic compounds in food and how they may be used as prophylactic

treatments to prevent bacterial infection in the gut.

The project is called "Exploiting Biological Properties of Non-digestible Oligosaccharides to Improve Food Safety," and Quintero works under the supervision of Robert Hutkins, professor in food science and technology.

"We test prebiotic compounds for their ability to inhibit the adherence of pathogenic bacteria to intestinal cells, which can grow in your food," Quintero said.

When a person gets sick from a foodborne illness, it results from swallowing bacteria,

which then attach to cells in the intestinal wall.

A prebiotic compound has a structure similar to an intestinal cell receptor, allowing the bacteria to attach to it instead of the cell. The compound is not digestible and is flushed out of the body, taking the bad bacteria with it.

**"WE TEST PREBIOTIC COMPOUNDS FOR THEIR ABILITY TO INHIBIT THE ADHERENCE OF PATHOGENIC BACTERIA TO INTESTINAL CELLS, WHICH CAN GROW IN YOUR FOOD."**

"The idea is prebiotic compounds act like decoy molecules," Quintero said.

Prebiotic compounds are often found in

infant formula because they also enhance the growth of good bacteria, she said.

Quintero received her bachelor's degree in agro industrial production engineering from La Sabana University, which is in her hometown of Bogota, Colombia. She transferred to UNL for an internship and worked with Hutkins in a food microbiology lab where she learned about prebiotics as anti-adherence agents.

"I got interested in food microbiology and decided to continue and pursue a degree," Quintero said.

Quintero, who received her master's degree in 2011, won the 2012 Outstanding Thesis in Food and Agricultural Sciences Award. The competition, which was organized by Texas A&M University-Corpus Christi and the American Association of Hispanics in Higher Education, was funded by USDA - NIFA. She plans to receive her Ph.D. next August and work in research or microbiology in the food industry.

Quintero said that she has enjoyed her experience studying food science at UNL.

"There is a lot of cultural diversity," she said. "It is a great program. The professors are very open to helping you."



## More members and speakers goal of new Food Science Club president

What are the two parts that make up gluten?

Questions like this one appear at a college bowl competition that UNL's Food Science Club attends every year. (The answer, by the way, is gliadin and glutenin.)

Incoming Food Science Club President Katie Hilgren hopes that this year brings more members and speakers for the club. Hilgren, a senior food science major, has been a member of the Food Science Club since she was a freshman in 2010. She served as vice president last year.

"I am looking forward to meeting new people and making more relationships," Hilgren said. "That's what I really enjoyed about the club so far."

The Food Science Club participates in many activities, including industry tours and selling ice cream for the UNL Dairy Store.

"I love food and I love science, so this combines them both," Hilgren said.

Hilgren has exciting plans for the club.

"I think something important for this year is to have something for club members to do besides attend once-a-month meetings," Hilgren said.

Hilgren said that she hopes club members will participate in the newly revitalized Aksarben chapter of the Institute of Food Technologists, a world-wide organization that brings together professionals, students and industry leaders who all have an interest in food science. The section will have events throughout the year where members from around the state can get together.

"It will provide an excellent networking opportunity for students because there will be a lot of members there who work in the food industry," Hilgren said. "I hope that students will participate because being a member of Aksarben and IFT gives them many opportunities to grow as a food scientist and see all that the food industry has to offer."

Hilgren will serve as a student representative of the Aksarben chapter this year.

She acknowledges that she will face some challenges as club president.

"The biggest challenge is keeping people in the club," she said. "We got a lot of freshmen last year. The challenge is recruiting juniors and seniors."



▲ *Katie Hilgren*

UNIVERSITY OF  
**Nebraska**  
Lincoln



## 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](http://www.nufoundation.org/foodscience). To learn more, please contact Ann Bruntz, IANR Director of Development, University of Nebraska Foundation, 402-458-1176, or email her at [abruntz@nufoundation.org](mailto:abruntz@nufoundation.org).

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