LAND AND FOOD SYSTEMS

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REACHOUT

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UBC

a place of mind

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DEAN'S MESSAGE

CLIMATE CHANGE IS NOT AN ABSTRACT IDEA or something we need to worry about in the future. We are seeing the impact of climate change globally and at a local level, as well. Here in BC, the effects are evident; in recent years, we've experienced an increase in droughts and flooding. As the weather continues to change, we have to find ways to adapt.

This is our new normal. Fortunately, science can help.

Everything we do in the Faculty of Land and Food Systems has an end goal of creating a healthier, more livable and more sustainable society. Our researchers are leaders in their respective fields, scientists who have made it their life's work to solve some of our most critical challenges.

We are working with our communities to directly address key issues. Assistant Professor Sean Smukler and Associate Professor Maja Krzic, for example, are helping farmers in Delta, BC find ways to improve soil in the region. This is crucial research, as the quality of soil can impact a farmer's ability to grow food.

Our students and alumni, too, are making the world a better place. Many of our recent alumni are already sharing the knowledge they gained in our programs with other countries. Like Maureen Gitana, a graduate of our Masters of Food and Resource Economics professional program, who returned to Kenya, her home country, to take a role as a consultant at a strategy consulting firm focused on development. And Kyly Whitfield, who just completed her PhD in Human Nutrition, has accepted a job as a tenure track assistant professor in the Department of Applied Human Nutrition at Mount Saint Vincent University in Halifax.

Our faculty members, students and alumni may work all over the world, but we remain connected as a community, with a collective focus of improving the quality of life for all of us.

RICKEY YADA
DEAN, FACULTY OF LAND AND FOOD SYSTEMS


KARA VOGT

LFS Dietitian on the Possibilities and Pitfalls of Meal Replacements

THE MEAL REPLACEMENT INDUSTRY is big business. Sales for the liquids and powders that act as a substitute for solid food have increased steadily over the past few years. In the United States, the industry is set to reach $3.9 billion in sales in the next three years, according to a 2014 report by Euromonitor, an international market research firm.

Economic success has led to stiff competition amongst the companies and labs concocting what some have called "food of the future." From Boost to HerbaLife to Soylent, the variety of products available to consumers has never been more abundant.

But can these drinks really replace food? And how do you know which one to buy? Kara Vogt, Dietetics Practice Educator and Clinical Instructor in the Faculty of Land and Food Systems, helps explain meal replacements.

Can someone solely survive on meal replacements?

It is technically possible. The products on the market are designed to contain a balance of carbohydrates, proteins, fats, vitamins and minerals to meet the nutritional needs of the average person. It might not be terribly exciting, given these drinks have limited flavor options and lack texture. When we consider what a healthy approach to eating actually is, it's a lot more complicated than simply consuming nutrients for survival. Taste, texture, and social interaction all play a big part in a healthy approach to eating. From a clinical perspective, some people live off of meal replacements out of necessity. For example, someone who has had a severe stroke and can no longer chew and swallow would rely on a fully liquid diet.

With so many different brands available, how does a consumer know which product is the best meal replacement drink for them?

The balance of nutrients in most liquid products is quite similar. However, the source and quality of the nutrients can be variable. Proteins used in liquid products can be from plant or animal sources and fats can be unsaturated or saturated. Since nutrition drinks are manufactured products, the ingredients are not the most natural even if products claim to be. That could be a concern for people who strive to choose foods that are closest to their natural form. The marketing campaigns behind each product make them appear to be very different from one another, when in reality many of the nutrients in each product are quite similar.

How can meal replacements factor into a healthy diet?

I think most of the people who incorporate meal replacements into their diet do so by balancing them with solid food, such as opting to have a shake for a breakfast and then solid food for lunch and dinner. They don't exist solely on meal replacements. I think anyone can make it work in balancing meal replacements with other things to eat. One key pitfall of liquid nutrition is the risk of consuming too much throughout the day. Liquid drinks don't keep you full for very long, which can lead to over-consuming calories.

RESEARCHERS TEAM UP TO HELP LOCAL FARMERS

SOLVE SOIL MANAGEMENT ISSUES

SOIL IS ONE OF THE EARTH'S MOST PRECIOUS RESOURCES. Good soil health plays a vital role in our food system and is critical to ensuring an abundant food supply. But keeping soil healthy can be a challenge, especially as we face the impact of climate change on our environment.

Assistant Professor Sean Smukler and Associate Professor Maja Krzic together with their graduate students are working on complimentary research projects to help address some of the serious soil issues that farmers in Delta, BC are up against.

"Changes in precipitation have impacted farmers' ability to produce crops," said Smukler, whose climate change adaptation project is looking at soil drainage issues on 30 fields across Delta. "Irrigation and drainage issues have produced a buildup of salt in the soil. Plants don't like salt. A build up of salt in the soil can reduce crop productivity. In some cases, salt can completely reduce crop yields to zero."

Smukler's research will provide updated drainage recommendations for the region as well as a current cost benefit analysis of management options for farmers. He's also working on a grassland set aside project that examines to what extent soil quality improves on fields that are left fallow, as well as what happens to the production of vegetables when those fields are put back into rotation.

Krzic's project builds on Smukler's research. Over a five year period, she'll follow the changes in soil properties after the grassland set asides have been planted.

"Soil conservation is a long-term process," she said. "When soil properties have been compromised by overuse and excessive tillage that will inevitabely lead to decline of soil quality. One approach that will improve soil quality, is to take the land out of production for a period of time."

To help return soil to a healthier state, the field is seeded with a mix of grasses and legumes, and left fallow for at least a year, sometimes more. Adding organic material supplies additional nutrients for the soil and also protects the soil surface from the impact of rainfall. Once the field is put back into commercial production, the hope is that the soil is in a better condition and will ultimately increase production yields.

Taking valuable land out of production to rest the soil is a costly proposition for farmers, however. Fortunately, the Delta Farmland and Wildlife Trust – a non-profit organization established in the 1990s by Associate Professor Emeritus Art Bomke and former LFS Research Associate Wayne Temple – provides local farmers with $325,000 of cost-share funding to help them invest in the long-term health of their soil while providing habitat for a diversity of wildlife, including birds migrating along the Pacific Flyway.

"The research we're doing is of direct, immediate relevance to farmers," said Smukler. "It's exciting to potentially be able to provide them with solutions for their soil issues."

"Plants don't like salt. A build up of salt in the soil can reduce crop productivity. In some cases, salt can completely reduce crop yields to zero."

One recent study found that hot chocolate is even higher in antioxidants than wine or tea.

Chocolate AS A HEALTH FOOD

WHEN YOU THINK OF HEALTH FOOD, chocolate probably isn't the first thing that comes to mind, but with its high antioxidant value, it just might help you achieve better health.

Foods with a high antioxidant capacity, like pecans, blueberries, and chocolate, may help prevent cancer and heart diseases. The cocoa bean is rich in different phenolic compounds, the major compounds that contribute to antioxidant capacity.

"One recent study found that hot chocolate is even higher in antioxidants than wine or tea," said Yaxi Hu, a PhD student in our Food Science program.

Traditional methods for testing antioxidant compounds are time consuming and labour intensive, however, often taking several days to complete. Hu is working with Assistant Professor Xiaonan Lu on developing a faster but still accurate test, one that would only take a few minutes to complete – something that would be of great benefit to the chocolate industry.

"A lot of chocolatiers want to produce chocolate with an antioxidant capacity as high as possible in order to meet consumer needs," she said. "Testing for antioxidant levels can give them guidance on which beans to select and allows them to optimize the processing parameters. Currently, antioxidant levels are determined through time-consuming and labor-intensive experiments. This developed method could help them determine the levels much faster and at less cost than traditional tests."

Using a Fourier-transformed infrared (FT-IR) spectroscopy, a tool that collects signals that can identify chemicals, Hu can determine the antioxidant levels in chocolate in less than two minutes. This research, which was accepted for publication in Food Chemistry in January 2016, also has the potential to be of use to consumers. "With advances in technology, you could use a portable spectrometer, such as a laser conjugated to your phone, to scan a sample of food. The sample would be analyzed with a corresponding app in your phone and with the data reported back you know the antioxidant levels in that food immediately."

The project builds on Assistant Professor Xiaonan Lu's research projects in developing sensors to characterize various components in food products, such as quantifying the total phenolic content and antioxidant capacity in garlic.

"We wanted to see if it was possible to transfer that technique to other food commodities," added Hu, who worked on the research with Assistant Professor Lu during her MSc in Food Science.

Hu decided to specialize in food science because she wanted to do research that could be applied to daily life. "We depend on food," she said. "Having a better understanding about food microbiology, food chemistry, and food safety can change the way we think about our life style."

LFS Dietetics Students Team Up With UBC Dentistry Dental Hygiene Students to Promote Nutrition and Oral Health

ON FRIDAY, MARCH 11, students in our Dietetics program and in UBC's Dental Hygiene program were recognized for their recent collaborative work in writing consumer articles that link nutrition with oral health.

Under the leadership of LFS Lecturer Dr. Gail Hammond and Assistant Professor Dr. Leeann Donnelly, UBC Dentistry, the students produced two articles for publication in *ChopChop*, a fun magazine for families with a circulation of over 500,000 copies per issue.

The celebratory event had Vij's Kitchen buzzing all day with chef demos, student presentations, and teams of three—one dietetics student, one dental hygiene student, and a local elementary school student—making fresh pasta, sauce, salad, and a chocolate dessert. A big thanks to Dr. Greg Chang, a UBC Dentistry Alum and creator of SuperChefs, a cooking program that teaches kids basic cooking skills and nutrition, for arranging the chef demos, providing the food, and creating a video of the event.

This inter-faculty, interprofessional partnership immersed our students in hands-on collaborative work with other health professional students, not unlike what will be expected of them in the workplace. Hammond, Donnelly and Chang look forward to working with new dietetics and dental hygiene students to produce a series of nutrition and oral health articles for *ChopChop* magazine that will profile UBC LFS and Dentistry across North America.

Vikram Vij and Meeru Dhalwala Receive UBC Centennial Honourary Degrees

UBC RECOGNIZED 13 CENTENNIAL HONORARY DEGREE recipients during spring graduation ceremony on May 27th, among them internationally respected Vij's restaurateurs Vikram Vij and Meeru Dhalwala. UBC awards honorary degrees in recognition of substantial contributions to society at the provincial, national or international levels.

Vij and Dhalwala are award-winning restaurateurs, chefs and cookbook authors. Co-owners of Vancouver's Vij's and Rangoli restaurants – which source organic produce and herbs from UBC Farm – they are committed supporters of sustainable agriculture, gender equity and socially responsible entrepreneurship.

Both also have a special connection to our Faculty; Dhalwala is a key fundraiser for the Centre for Sustainable Food Systems at the UBC Farm. She is also the founder and organizer of Joy of Feeding, the annual international food fair at UBC Farm and recently gave a talk on the Future of Food Sources as part of the UBC 100 closing celebrations. Vij donated towards an extensive makeover of the culinary laboratory in our Food, Nutrition and Health building, creating Vij's Kitchen, which provides a learning space for basic food theory, food preparation in a domestic setting and multicultural culinary exchange.

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LFS CENTENNIAL SESSION **TEMPLE GRANDIN: MAINTAINING HIGH STANDARDS IN ANIMAL WELFARE**

THE FACULTY WAS PLEASED TO WELCOME renowned Animal Welfare expert and autism activist Dr. Temple Grandin on February 25th at the fourth LFS Centennial Session: *Critical Issues in Land and Food Systems*. Dr. Grandin spoke on maintaining high standards in animal welfare to a crowd of more than 300 guests at UBC's Robert H. Lee Alumni Centre. The presentation was hosted by Professor David Fraser, whose own work has greatly contributed to the field of animal welfare, and was sponsored by the Animal Welfare Foundation of Canada and *alumni UBC*.

To hear a recording of Dr. Grandin's presentation, please visit reachout.landfood.ubc.ca/podcasts

Review of Unnecessary Surgeries on Companion Animals

KATELYN MILLS always planned to go into veterinary medicine. But as a student in our Applied Biology program, her career path took an unexpected turn after she enrolled in a research methods class with UBC Animal Welfare Profs. Nina von Keyserlingk and Dan Weary.

"I never thought a career in research was something I wanted, but that course changed things for me," said Mills, who graduated with a BSc in Applied Biology in November 2015 and is now working as a Research Assistant in the UBC Animal Welfare program. "The Applied Biology program gave me the opportunity to design my degree, which is very different from other biological sciences programs."

Part of designing her degree meant that Mills had the freedom to work on a directed-studies project. Last year, she spent four months conducting a literature review of unnecessary surgeries on companion animals, the results of which were published in the January 2016 issue of *The Journal of the American Veterinary Medical Association*.

"There's a lot of information on controversial surgeries that are not medically necessary or beneficial to the animal, like declawing or ear cropping, but there hadn't been a review done on this topic before in companion animals," she said. "We wanted to get all the information in one place as a starting point."

Mills worked on the review under the supervision of Professor von Keyserlingk, and Dr. Lee Niel from the University of Guelph. She hopes the review will result in discussions about the welfare concerns of these procedures and eventually legislation that will outlaw these procedures. While there are currently no federal laws in place to prevent tail docking or declawing, provincially we're starting to see small changes; ear cropping was recently banned in BC.

"While we know that procedures like tail docking or declawing are painful, little research has been done to determine how much pain these surgeries are causing, but in many cases they are done without anesthetics or analgesics," she said.

Some of these surgeries have been performed since ancient times. In the Middle Ages, tail docking was performed on hunting and fighting dogs to lessen the risk of injury to the tail and is still commonly performed on dogs of various hunting, working, and terrier breeds.

"Breed advocates often believe they should have the right to uphold the integrity of breed standards," Mills said. "But ultimately, the goal should be to change how people view these procedures and hopefully then we change the need for these unnecessary surgeries."

ALUMNI PROFILE

MAUREEN GITATA

MASTERS OF FOOD AND RESOURCE ECONOMICS

GROWING UP IN NYAHURURU, Kenya, Maureen Gitata knew that a scholarship was probably the only way she'd be able to go to college. Many in her community, including her parents, are part-time subsistence farmers, growing enough food to feed their families with a little left over to sell.

"I saw my parents struggle to put my siblings and me through primary and high school," Gitata says. "I knew I'd need a scholarship if I wanted to further my education."

So she set about earning one. Gitata got a scholarship to study economics at St. Lawrence University in New York, and after working in finance in Boston, Massachusetts for a year, arrived at UBC in 2015 as a MasterCard Foundation Scholar.

The MasterCard Foundation Scholars Program at UBC provides academically talented yet economically disadvantaged young people from Sub-Saharan Africa access to quality and relevant university education who are interested in moving back and contributing to economic progress in their countries. Gitata enrolled in our Masters of Food and Resource Economics (MFRE) program, a one-year course-based professional master's degree geared towards graduates and professionals looking to sharpen their skill-sets with more advanced economics and real world applications.

"The MFRE's focus on applied economics, policy, and agribusiness management was very well aligned with my career goals," she said. "I wanted to gain advanced studies in economics and specialize in a field relevant to international development, and it's provided me with a wide range of skills and knowledge."

In Kenya, agriculture contributes 30% of the country's GDP. Through the MFRE program, Gitata learned the economics of the agricultural sector, and the policies that are necessary to uplift the agricultural sector and economy of Kenya, as well as other developing countries that rely on agriculture as the key driver of economic growth. After graduation, Gitata returned to Kenya, where she accepted a consultant position with Dalberg Global Development Advisors, a strategy consulting firm focused on development.

MFRE.LANDFOOD.UBC.CA

MILESTONES

ASSOCIATE PROFESSOR MAJA KRZIC.

LFS FACULTY MEMBERS RECEIVE MORE THAN $100,000 IN TLEF GRANTS

Congratulations to Associate Professor Maja Krzic, Associate Professor Hannah Wittman, Associate Professor Christine Scaman and Senior Instructor Karol Traviss on receiving UBC Teaching and Learning Enhancement Fund (TLEF) awards. Combined, they received more than $100,000 in TLEF grants for their projects. TLEF was created in 1991 to enrich student learning by supporting innovative and effective educational enhancements.

LFS RESEARCHERS RECEIVE CFI JOHN R. EVANS LEADERS FUND

Two of our researchers received funding from the John R. Evans Leaders Fund, which helps universities attract and retain researchers by providing funding for tools and laboratory equipment, infrastructure and operating costs. Assistant Professor Siyun Wang was awarded a $68,000 grant for her research on Molecular Characterization of Salmonella Enterica in Food Supply Systems, while Assistant Professor Simone Castellarin received $125,000 – along with an additional $125,000 from the British Columbia Knowledge Development Fund – for his project Molecular and Physiological Regulation of Fruit Ripening and Composition in Grapevine.

MAJA KRZIC NAMED 3M NATIONAL TEACHING FELLOW

Congratulations to Associate Professor Maja Krzic on being named 3M National Teaching Fellow. The 3M National Teaching Fellowship is Canada's most prestigious recognition of excellence in university teaching and educational leadership. Maja is one of ten 3M National Teaching Fellows this year; she's the first Fellow from LFS and 18th Fellow from UBC since 1986.

Maja was also recently named the *Natural Sciences Education* Outstanding Associate Editor for 2015 from the American Society of Agronomy.

CANDICE RIDEOUT AWARDED UBC KILLAM TEACHING PRIZE

Candice Rideout, Instructor in our Food, Nutrition and Health program, received the the 2015/16 Killam Teaching Prize. This award recognizes excellence in teaching. Candice has achieved outstanding student evaluations in both large and small classes since her appointment in 2012. She uses innovative approaches to engage students and fosters an inspiring classroom environment to produce a transformative learning experience.

PREMIER UNDERGRADUATE AWARD

Michelle Ebtia, a fourth year student in our Food, Nutrition and Health major, received a Premier Undergraduate Award. These awards are the University's most prestigious designations, given to senior students with outstanding academic performance, leadership, and involvement in student and community activities. Michelle received the $10,000 John H. Mitchell Memorial Scholarship. She has also been named a Wesbrook Scholar, one of 20 UBC students to receive the designation along with a $1,000 scholarship.

LFS RESEARCHERS APPOINTED CANADA RESEARCH CHAIRS

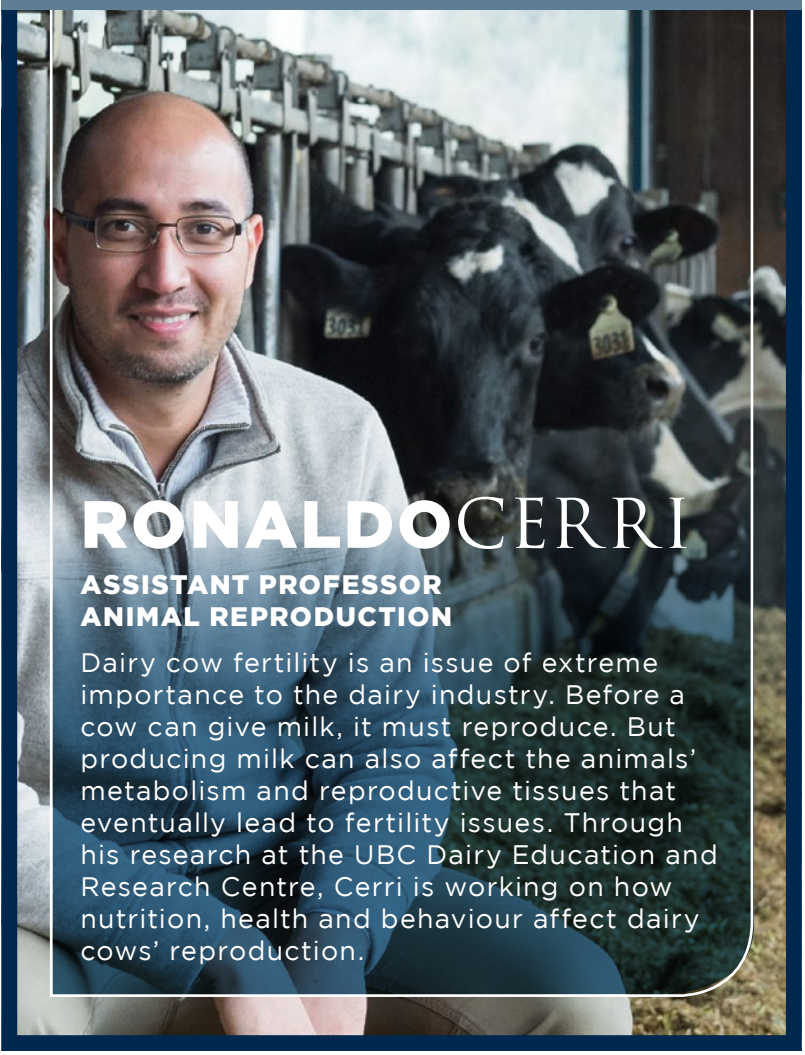
Assistant Professor Simone Castellarin (Wine Research Centre) and Assistant Professor Yvonne Lamers (Human Nutrition) were two of 31 UBC professors appointed/renewed as Canada Research Chairs (CRC) in 2016.

SIMONE CASTELLARIN, *Canada Research Chair in Viticulture and Plant Genomics*. Castellarin studies the biological mechanisms that control how grapes ripen and how they are affected by climate. He plans to develop new practices for growing grapes in B.C. and Canada with the goal of producing better fruit for high quality and more valuable wine.

YVONNE LAMERS, *Canada Research Chair in Human Nutrition and Vitamin Metabolism (renewed Canada Research Chair)*.Lamers studies vitamin B-12 and its role in fetal and infant development. The research will serve to review current public health policies related to nutrient intake recommendations.

The Canada Research Chair program helps attract and retain top researchers across the country.

RESEARCH SPOTLIGHT



RONALDO CERRI

ASSISTANT PROFESSOR
ANIMAL REPRODUCTION

Dairy cow fertility is an issue of extreme importance to the dairy industry. Before a cow can give milk, it must reproduce. But producing milk can also affect the animals' metabolism and reproductive tissues that eventually lead to fertility issues. Through his research at the UBC Dairy Education and Research Centre, Cerri is working on how nutrition, health and behaviour affect dairy cows' reproduction.

XIAONAN LU RECEIVES NSERC COLLABORATIVE RESEARCH GRANT, AND NSERC RESEARCH TOOLS AND INSTRUMENTS GRANT

XIAONAN LU, an Assistant Professor in Food Science, was awarded an NSERC Collaborative Research and Development Grant (CRD) of $330,000 over 3 years (with generous contributions from his supporting organization) to develop microfluidic devices to improve the detection of potentially hazardous and allergic chemicals in foods.

As the leading principal investigator, Lu also received a NSERC Research Tools and Instruments Grant. The funded project will be to apply portable Raman spectrometer to determine food and wine safety and quality.

Earlier this year, Lu received the International Union of Food Science and Technology Young Scientist Excellence Award. The Award recognizes an individual in the initial phases of her or his career for the potential to make outstanding scientific contributions to the field of food science and technology and the potential for future scientific leadership.

RECENT GRADUATE

KYLY WHITFIELD PHD, HUMAN NUTRITION

"I had so many opportunities at UBC," said Kyly Whitfield. "Getting a PhD in Human Nutrition was an opportunity to fuse my passions for research and travel. Did I ever make the right choice!"

That choice has led Whitfield to her new position as tenure track assistant professor in the Department of Applied Human Nutrition at Mount Saint Vincent University in Halifax.

Originally from Belleville, Ontario, Whitfield's research involved testing the efficacy of thiamin-fortified fish sauce to combat infantile beriberi in Cambodia. Beriberi is a potentially fatal disease caused by a lack of thiamin (vitamin B1) in the diet.

"Infantile beriberi has basically been eradicated everywhere in the world but Southeast Asia," she said. "In Cambodia, white rice is a large part of the diet but it's not a great source of thiamin and it also displaces other thiamin rich foods."

Maternal thiamin deficiency lowers breast milk thiamin concentrations, which in turn affects infant intake. "We knew that upping the mothers' thiamin intake would increase breast milk thiamin, and in turn thiamin intake among breastfed babies. We decided to fortify fish sauce because it's consumed by 90 percent of Cambodians, so it was already a regular part of their diet."

In 2014, Whitfield, along with her PhD supervisor, former LFS Professor Tim Green, received $112,000 for the project through a Grand Challenges Canada "Stars in Global Health" seed grant.

Whitfield worked with Helen Keller International in Prey Veng, Cambodia. She performed sensory tests on the fish sauce to see if thiamin-rich affected the flavor (it did not). She then worked with a Cambodian company to develop and package the fish sauce. Next, she conducted a randomized controlled trial in which pregnant women received either a control (placebo) sauce, a sauce with a low concentration of thiamin or a sauce with a higher dose of thiamin.

"We found that the pregnant women who consumed either the low concentration or high concentration thiamin-fortified fish sauce over a six month period had significantly higher concentrations of thiamin in their blood compared to the women who consumed the control [placebo] sauce."

Whitfield is currently writing grants to continue the project on a larger scale and get the thiamin-fortified sauce on the market, and is excited to start her own research program. "I'd like to start an international nutrition course at Mount Saint Vincent University so I can share my experiences."

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