LAND AND FOOD SYSTEMS

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UBC THE UNIVERSITY OF BRITISH COLUMBIA

DEAN'S MESSAGE

WE LIVE IN UNPRECEDENTED TIMES. Climate change, population growth, food and nutrition insecurity, water shortages – in recent years, these issues have become top of mind problems, as the impacts of these challenges are felt globally.

The Faculty of Land and Food Systems is uniquely positioned to deal with many of the most concerning global food systems issues. Through teaching, research and service, we contribute to a healthier environment and a better understanding of the relationship between food, diet, nutrition and health. As global populations become more urbanized, our urban location gives us the advantage of addressing research challenges such as how to feed expanding urban populations through high density agriculture while producing nutritious foods in a sustainable, environmentally and animal friendly manner.

In October 2015, we launched our Faculty Action Plan. Over the past year and a half since, the need to be more focused in our research activities has become evident. Going forward, we will focus on three key areas – sustainable agriculture, food, nutrition and health, and food safety and quality. Concentrating on these three critically important areas of research will allow us to make a significant global impact.

The diverse expertise of our Faculty, and our small size, give us the ability to capitalize on our individual strengths while working together on critical agri-food initiatives. Our researchers are known for their innovation and leadership. Assistant Professor Simone Castellarin, for example, is working with growers in the Okanagan to help them improve the quality of their fruit, and thereby create a better tasting wine. And George Iwama, Vice-Dean for Aquaculture and Strategic Initiatives, is involved with a project to develop a scalable and modular aquaponics and renewable energy system to sustain humans in space.

We are also committed to building community and engaging our students through experiential and problem-based learning. Nicollette Lax, a fourth year Applied Biology student specializing in Plant and Soil science, had the chance to take her learning outside the classroom last year when she worked on a research project on the UBC Farm.

There is truly some amazing research happening in the Faculty of Land and Food Systems. I hope as you read these stories, you are as inspired by our faculty, staff and students as I am.

RICKEY YADA
DEAN, FACULTY OF LAND AND FOOD SYSTEMS

CENTRE FOR SUSTAINABLE FOOD SYSTEMS AT UBC FARM RECEIVES $500,000 FROM VANCITY

THE CENTRE FOR SUSTAINABLE FOOD SYSTEMS at UBC Farm received $500,000 from Vancity's enviro™ Visa program, the enviroFund™ in support of a proposed food and beverage pilot processing facility.

The UBC Farm's Business and Agri-Food Research Network (or BARN@UBC Farm) will help to develop and support B.C.'s sustainable food and beverage sector. The BARN@UBC Farm will be an integral part of the sustainable food systems living laboratory stewarded by the Centre for Sustainable Food Systems at UBC Farm and will focus on teaching, research and community engagement around environmentally and socially sustainable food systems.

"Vancity is the first company to pledge support for our pilot processing facility. This project provides critical food science infrastructure, research, and teaching support ensuring that BC's sustainable food and beverage entrepreneurs will be able to start and grow their businesses. BC is is one of the few provinces without a significant pilot processing research and development capability and Vancity is helping us change that," said Rickey Yada, Dean of the Faculty of Land and Food Systems.

Vancity's contribution will not only help build these important new facilities, but will also support sustainable local food business development programs through partnerships such as Feeding Growth, a community of leaders, supports and businesses, organizations, and institutions whose aim is to establish British Columbia as a globally recognized center for production and innovation for environmentally progressive, natural and/or organic, ethnical and socially responsible retail and package goods companies. This series, which is a collaboration between the CSFS, Vancity, and Brian Saul of Fluid Creative, connects values-based BC packaged food entrepreneurs with business sector leaders for advice and support in building a brand, scaling manufacturing and distribution, and accessing financing. Several local companies have already seen the benefit of working with Feeding Growth, including The Good Stuff, an organic ready-to-blend smoothie company established by two UBC students.

"The success of our business has been in having access to local, organic food and support from the experts at Feeding Growth. We're proud that we source our food locally, which allows us to provide healthy food to our customers, create local jobs and contribute to growing our local economy," said Tonner Jackson, co-founder, The Good Stuff. ⊙

LFS ANIMAL WELFARE ALUMNI COME TOGETHER TO CREATE WILDLIFE ACCREDITATION PROGRAM

THREE UBC ANIMAL WELFARE PROGRAM ALUMNI have joined forces to create an accreditation program that will encourage wildlife and rodent control companies to make ethical decisions when controlling wildlife populations.

Sara Dubois (PhD & MSc, Animal Science, 2014 & 2003), Nicole Fenwick (MSc, Animal Science, 2005) and Erin A'tman Ryan (BSc Applied Biology, Major in Applied Animal Biology, 2014) have consulted extensively with the pest control industry in the province and with animal welfare scientists internationally, to create humane wildlife control standards to inform the novel accreditation program.

"I've seen significant welfare concerns for wildlife in pest control with injured and orphaned wild animals being brought in to the BC SPCA as a result of bad practices," said Dubois, an Adjunct Professor in the UBC Animal Welfare Program and Chief Scientific Officer at the BC SPCA. "The accreditation program is a practical approach to resolving urban animal welfare issues in BC."

Dubois and Professor David Fraser initiated the project in 2014 with an application to the **Peter Wall Institute**. The Wall Solutions Initiative enables UBC faculty members to address issues of societal importance through innovative, interdisciplinary and academically rigorous research projects. UBC researchers engage with end-users or community partners – in this case the BC SPCA – to develop innovative research solutions that can be adopted by those end-users or other target communities.

The Peter Wall Institute recently awarded the project a third and final year of funding, bringing its support to a total of $150,000. This funding enabled the hiring of Erin Ryan in December 2014 and her continued salary as a Research Coordinator on the project. Nicole Fenwick joined the project officially as Manager of Research and Standards in April 2016, after matching grant funding of $180,000 was received from the **Vancouver Foundation** to develop the operations of the accreditation program. With program development supported by these grants, future program operations will be run as a cost-recovery social enterprise by the BC SPCA.

The first-of-its-kind accreditation program will be piloted with a select group of BC pest control companies next year, with an eye towards a full provincial roll out in 2018, and a national strategy in 2019. To date, Dubois and her team have worked on standards for more than 70 wild animals, hosted an international expert forum on wildlife control, published related articles, reports and knowledge translation tools, presented to the pest control industry and humane associations in Canada, and partnered with three student teams in the **Sauder Business School Masters of Management Community Business Project** on a feasibility study, business plan and most recently a marketing plan. ⊙

Undergraduate Student's Research Yields Big Results

NICOLETTE LAX always knew she wanted to study nature. "I grew up in rural northern California, and I spent a lot of time outdoors. I was interested in learning more about the world around me and how to create a more sustainable environment," said Lax, a fourth year Applied Biology student specializing in Plant and Soil science.

"As a student in LFS, I'm able to take what I'm learning in the classroom and apply it in the field. I learned about sustainable farming and then walked over to UBC Farm and experienced it first-hand. The farm is an amazing teaching tool and it really helps to connects students with what they're learning."

Last summer, Lax had the opportunity to work at the UBC Farm on a research project with Professor Andy Black and PhD student Hughie Jones. The project tested the effects of using different types of plastic for low tunnels to create microclimates in which plants can grow faster, earlier, and produce higher yields.

She conducted a two-month trial at Cropthorne Farm in Ladner, BC on zucchini. "We found that using low tunnels over crops can increase crop yield and biomass by 20%. That's pretty significant for not having to do much extra work."

Low tunnels are cost-effective and portable, and can be used by everyone from farmers to backyard gardeners. They have proven to work very well in northern climates and areas that are effected by climate change, where food insecurity is an issue.

"All of the experiences I've had in LFS and the skills I've gained have given me confidence," Lax said, adding that she's planning to write a thesis on her research. "I'm excited about the future and all the different paths I could go down." ⊙

MASTER OF FOOD SCIENCE ALUM OPENS LOCAL BREWERY

FACULTYBREWING.COM

THE GOAL OF OPENING YOUR OWN BREWERY might be enough for some people, but Mauricio Lozano has taken it one step further, by creating a more open environment for beer drinkers of all levels, and in turn growing the craft beer industry in Vancouver.

"I want to see craft beer in the same setting you might see a bottle of wine - whether it's bringing a beer to someone's home or for a girl's night in" says Mauricio. "Craft breweries are trying to change the perception of beer into a more sophisticated drink."

Originally from Mexico, Mauricio graduated from the Faculty of Land and Food Systems in 2009 with a Master of Food Science. "My passion is in microbes, in using the good bugs, minimizing bad bugs and killing the ugly bugs." His love for beer began earlier, while living in Leeds, England where he helped brew beer in labs.

In 2013, when the City of Vancouver changed its bylaws to allow tasting lounges in small craft breweries and distilleries, Mauricio saw the opportunity to combine his passion for beer, bugs, and teaching.

Since opening last summer, Faculty Brewing Co. has joined a rapidly growing market in a city that's been dubbed the new craft beer capital of North America. "In the six months since opening we've already had a great response" Mauricio says. This success can be seen in winning Vancouver's best new brewery award in the 2017 Georgia Straight Golden Plates Awards.

Faculty Brewing Co is meant to remind visitors of a university, as a place of learning and idea sharing. This is most evident in the unique numbering system: beers are numbered like university course numbers, where 100 represents entry-level beer, and higher numbers are more experimental beers with bold-flavours. "The number system helps introduce people to the craft beers, and allows them to get more adventurous each time they return."

And like any university, Faculty Brewing encourages the exchange of ideas. All of its recipes are posted on their website, and Mauricio eagerly takes feedback from customers and other brewers. "We believe that increasing craft beer education will increase craft beer consumption, and that's a win for everyone." ⊙

THE SCIENCE BEHIND A GO

"**WINE IS A GLOBALLY COMPETITIVE BUSINESS.** Wineries need to meet a certain level of quality in order to be successful in the market," said Simone Castellarin, Canada Research Chair, Viticulture & Plant Genomics and an Assistant Professor in the UBC Wine Research Centre. "Science can provide growers with research that can help them improve the quality of their fruit, which will ultimately result in a better tasting wine."

Castellarin works closely with growers to identify potential research projects that will most benefit the industry. "Growers are in the vineyards every day and are very helpful in developing new projects," he said, adding that he's currently working with grape and wine producers in the Okangan valley — where most BC wine grapes are grown — to understand how growers can use crop irrigation to enhance wine quality.

"By applying stress to a crop — such as limiting the amount of water the crop receives — we can potentially impact the production of aromatics in grapes and later on in wines," Castellarin said. "I'm looking at which water irrigation management strategies can improve the quality of grapes, and ultimately the flavor of the wine, as well as how these situations affect the metabolism of the fruit."

The three-year study, supported by the BC Wine and Grape Council and BC Investment Agriculture Foundation, began last summer. White grape samples were collected from vineyards and then later measured for aromatics in Castellarin's lab.

While water irrigation strategies are often used on red grapes, the impact of these same strategies on the quality of white grapes hasn't been widely researched; white grapes are normally grown in wetter climates, where the plant's access to water isn't restricted. Castellarin's lab — an international group of researchers and students from Canada, France, China, Italy, Poland, Mexico, and Australia — is one of the first to test the reaction of water deficit on white grapes.

Using less water to irrigate the plant could not only help to create a more sustainable operation, it could potentially improve the aromatics of the grape.

"Many wineries are working to make sure they are considering the environmental impact of their production, like reducing amounts of water used for producing grapes or reducing pesticides," said Castellarin.

Castellarin's research is shaped by the summers he spent working on his family's vineyard in Italy while he was growing up, and several international research experiences in Europe and North America. He joined the UBC Wine Research Centre, a pioneering research centre in enology and viticulture to promote the technological advancement of the wine industry in Canada and beyond, in 2014. This summer, he will teach a field lab course focused on wine grape production in Kelowna, one of the first joint courses offered by UBC Vancouver and UBC Okanagan (APBI 490/APBI 420).

"Working with grapes and wine has given me the opportunity to interact with many people from around the world," he said. "I feel lucky to be doing research in a field I really like." ⊙

WINE.LANDFOOD.UBC.CA | CASTELLARIN-LAB.LANDFOOD.UBC.CA

OD BOTTLE OF WINE

“By applying stress to a crop … we can potentially impact the production of aromatics in grapes and later on in wines.”

George Iwama, Vice-Dean, Aquaculture and Strategic Initiatives

"The sustained production of all seafood will become increasingly important in the future," said George Iwama, Vice-Dean for Aquaculture and Strategic Initiatives in the Faculty of Land and Food Systems. "It's vital that we develop technologies and processes that make food and energy safe and affordable, especially for island and remote communities around the world."

Iwama, a fish physiologist, is interested in sustainable food production systems involving aquaculture and aquaponics, integrated with renewable energy systems.

"Developing aquaponics as an important part of sustainable food systems has great potential," he said, adding that he's currently involved with an initiative to develop a scalable and modular aquaponics and renewable energy system to sustain humans in space. Of course the immediate applications are to serve the needy communities on earth. He's co-leading an initiative called the International Year of the Salmon, a concerted effort to address all aspects of salmon on a hemispheric scale. Salmon are an important part of our ecosystem, as well as a culturally and economically important food, and they serve as a sentinel of the wellbeing of our aquatic environment.

Iwama recently returned to UBC after working for several years in senior administrative roles at the Okinawa Institute of Science and Technology Graduate University in Japan. As an alum — he earned his BSc, MSc, and PhD in Zoology — and former faculty member, UBC has held a firm place in his heart. In the late 80s, Iwama joined the Department of Animal Science and his office was in the Macmillan building – the same office, in fact, that he's now occupying. Besides taking on the position of Vice-Dean for Aquaculture and Strategic Initiatives, he's also the Assistant Director of the UBC Institute for Oceans and Fisheries, and an adjunct professor in LFS and the Department of Zoology.

Over the course of his career, Iwama has held many prominent positions at universities around the world, including Dean of Science at Carleton University in Ottawa, Dean of Science at Acadia University, Provost and Vice-CEO of the Okinawa Institute of Science and Technology Graduate University, and President and Vice-Chancellor of the University of Northern British Columbia. He was recently appointed Chancellor of Quest University Canada.

Iwama is the recipient of a number of academic fellowships and awards from the Natural Sciences and Engineering Research Council and the Killam Foundation, and is also the recipient of the Queen Elizabeth II Diamond Jubilee medal. ⊙

Former LFS Student Helps Create Student Run Rooftop Garden

YOU MIGHT NOT KNOW IT, walking out the fourth floor onto the roof of the new AMS Student Nest, but this space used to be empty. Right now, it features a large circular space of freshly turned earth and budding greens – a community garden at the very heart of the UBC Vancouver campus.

Roots on the Roof (or the UBC Rooftop Garden Club) is an entirely student-run club that began in April 2015, by founder Brendan Chan. Brendan was a fifth year student in Land and Food Systems who had previously worked at Orchard Garden. Together with other like-minded students, he had a passion for using food to bring people together and to form a community. After two months of work and set up, the garden was officially opened in June.

They have 192 square metres of growing space enclosed by a fence, and the food from this area is grown for sale to food outlets and market stands in the Nest. There are also five community plots, which is reserved for club members.

The garden is much more than a business. It plays host to food literacy workshops, "garden drop-ins" where anyone can get their hands dirty in the soil, and Lights on the Roof, a night of local art, music, and food with beautifully painted lanterns that decorate the rooftop.

"We want the community to engage with food in a creative way, open up discussions around how we value food, and to have people experience food and share that experience with others" says current President of Roots on the Roof, Lucas Chan. ⊙

BLOGS.UBC.CA/ROOTSONTHEROOF/

THE BC SEED TRIALS

GROWING LOCAL: THE BC SEED TRIALS

You might know where the veggies on your table come from, but do you know where the seeds are grown? It's a question even most farmers can't answer, but the BC Seed Trials aim to show the impact of using local seeds.

"Knowing where your seeds come from is really important," says lead researcher Dr. Alexandra Lyon. "Because farmers are losing access to varieties that work really well for them, particularly in organic agriculture."

The BC Seed Trials were launched in 2016 by the Centre for Sustainable Food Systems at UBC Farm and FarmFolk CityFolk, with support from the University of Fraser Valley, to see how diverse seeds perform on working farms, including the UBC Farm and partner farms across the Lower Mainland and Vancouver Island.

- Interested in saving seeds in your garden this year? Good crops to start with are tomatoes, lettuce, and peppers.
- Want to take part in the most delicious part of this research? Look out for tastings at the UBC Farm Farmer's Market this summer. Find details at **bcseedtrials.ca** and **ubcfarm.ubc.ca**

BUILDING A REGION-SPECIFIC SEED SYSTEM

The BC Seed Trials want to identify which seeds do best in our region, so farmers will want to plant BC-grown seeds.

"The seed industry is increasingly geared toward large-scale farming," says Dr. Lyon. "Small-scale and diversified farmers are less able to access varieties that work well for their regions and markets."

Dr. Lyon and her colleagues seek to create a region-specific seed system, where farmers can access seeds that do well in their soil and climate, since a kale seed from a major catalogue may thrive in the Okanagan, but fares poorly on the south coast.

In the trials they grow and compare vegetable varieties to see which ones are the hardiest, best producing, most attractive, and tastiest. These results inform both academics and farmers.

FIRST TRIAL RESULTS AND NEXT STEPS

The BC Seed Trials recently published results from 2016 – their first growing season – which focused on several varieties of spinach, beets and kale. Feedback from farmers informed what's growing in 2017: they will be trialing carrots, leeks, and golden beets, including some varieties that are new to the area. ⊙

WWW.BCSEEDTRIALS.CA.

The BC Seed Trials is a collaboration between the Bauta Family Initiative on Canadian Seed Security and Centre for Sustainable Food Systems at UBC Farm with support from University of Fraser Valley.

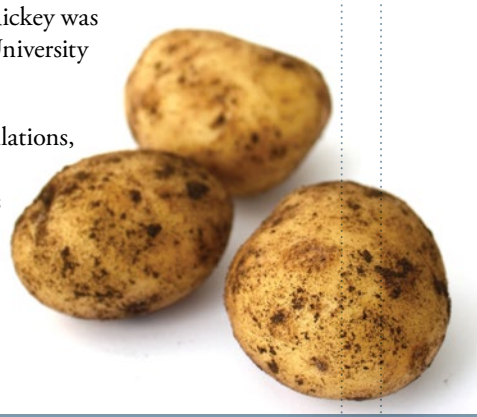
Food Science Research Could Lead to a More Pest-Resistant Potato Plant

THE POTATO is an integral part of the food supply for much of the world, and if the plant dies to disease there can be drastic consequences. But what if this could be prevented?

"My research is focused on antimicrobial protein from potato plants" says John Dupuis, a PhD Student in Food Science. "This protein can destroy microorganisms that might carry diseases such as *E. coli.* Right now I'm trying to understand the mechanism by which it can do this, or more specifically, which part of the protein interacts with it. In the long term, this knowledge could produce a more pest-resistant potato plant."

Dupuis is halfway through his PhD studies, and works closely with his supervisor, Dean Rickey Yada, whose own research looks at the proteins in potatoes and how their structure complements their function. This duo has much experience working together, as Rickey was supervisor for John's Master's thesis at the University of Guelph.

Dupuis is currently running computer simulations, with a protein structure that was previously crystallized. He also has two co-op students working with him for the summer. "We'll be characterizing the different forms of the protein, and doing more computer simulations to look at its interactions with model cell membranes." ⊙



MILESTONES

MAHESH UPADHYAYA MADE FELLOW BY INDIAN SOCIETY OF WEED SCIENCE

Plant Science Professor Mahesh Upadhyaya was made a Fellow for his contributions to weed science by the Indian Society of Weed Science at its national biennial meeting in Udaipur, Rajasthan in March.

AMS JUST DESSERTS AWARD

Christine Klaray, Director, Student Academic Services, and Candice Rideout, Instructor, Food, Nutrition and Health, both received an AMS Just Desserts Award in early 2016. They were selected by LFSUS for their outstanding commitment to the undergraduate student experience within our Faculty.

LFS GRAD STUDENT WINS 3 MINUTE THESIS COMPETITION

Grad student Manveen Kaur won the 3 Minute Thesis competition for UBC in March. Manveen presented her thesis on the *'Effect of protected Vitamin B supplementation on bovine uterus'*.

The Three Minute Thesis (3MT) is an academic competition that assists current graduate students with fostering effective presentation and communication skills.

GEORGE IWAMA NAMED CHANCELLOR OF QWEST UNIVERSITY CANADA

George Iwama, Vice-Dean, Aquaculture and Strategic Initiatives, was named Chancellor of Qwest University Canada in April. Quest University Canada is Canada's first independent, not-for-profit, secular university. It was founded in 2002 by former University of British Columbia president Dr. David Strangway.

ANIMAL WELFARE RESEARCHERS RECEIVE 2016 3RS PRIZE

UBC Animal Welfare Program researcher Joanna Makowska and Professor Dan Weary received the prestigious 2016 3Rs prize for their paper investigating the welfare of laboratory rats. The prize, awarded by the UK's National Centre for the 3Rs (NC3Rs) and sponsored by GlaxoSmithKline, consists of a £28k prize grant and a £2k personal award. Makowska, who earned her PhD from the UBC Animal Welfare Program in 2016 will use the grant to further explore how important specific behaviours are to laboratory rats.

UBC ANIMAL WELFARE TEAM TAKES FIRST IN INTERCOLLEGIATE ANIMAL WELFARE JUDGING & ASSESSMENT COMPETITION

The Animal Welfare Judging & Assessment Team took first place in the undergraduate competition at the 16th Intercollegiate Animal Welfare Judging & Assessment Competition held in November at Ohio State University. Congratulations to team members, and LFS Applied Animal Biology majors, Gabriela Schauber, Varsha Rani, Nevene Hammoud and Savannah Goldstein.

PETER LARKIN AWARD GIVEN TO MASTER OF FOOD AND RESOURCE ECONOMICS PROGRAM

Master of Food and Resource Economics team received the 2016/17 Peter Larkin Award for the significant, and positive impact, on student life, experience, and development that the program has accomplished. Each year the Vice-President, Students Office awards a Graduate Program or Department that makes exceptional contributions to student development at UBC Vancouver.

CRYSTAL KARAKOCHUK RECEIVES INTERNATIONAL LIFE SCIENCES INSTITUTE AWARD

Assistant Professor Crystal Karakochuk received the Early Career Contribution to Alleviation of Micronutrient Malnutrition Award from the International Life Sciences Institute in October at the Micronutrient Forum in Cancun, Mexico. This award recognized PhD candidates or post-doctoral researchers who have already contributed to the field of micronutrient investigation, through understanding causes, consequences or programs in deficiency reduction.

UBC HEALTH RECOGNIZES LFS, DENTISTRY AND SUPERCHEFS TEAM WITH THE 2016 PRACTICE EDUCATION TEAM AWARD

The leadership team of Drs. Gail Hammond (LFS), Leeann Donnelly (Dentistry) and Greg Chang (Dentistry, SuperChefs)–who mentored interprofessional teams of dietetic and dental hygiene students in writing, for international publication, consumer articles integrating oral and nutritional health–has been awarded the UBC Vice-Provost Health 2016 Practice Education Team award. The Practice Education Team Award was created by the former UBC College of Health Disciplines to honour an outstanding health care team that demonstrates interprofessional education and collaborative practice that is evident to students.

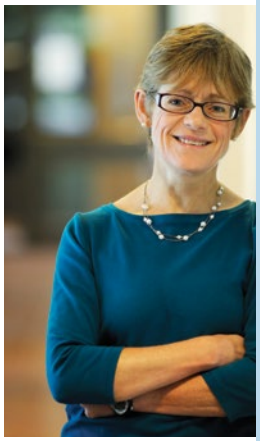
UBC DAIRY RESEARCH CENTRE HOUSING IS NAME 10-BEST RESIDENTIAL PROJECTS OF 2016 BY AZURE MAGAZINE

The UBC Dairy Education and Research Centre Housing was selected as one of the 10 best residential projects in 2016 by Azure magazine. Located in Agassiz, BC, the UBC Dairy Education and Research Centre is an internationally recognized as a world-class facility supporting the development and adaption of new technologies for the dairy industry in BC and beyond.

ASSISTANT PROFESSOR XIAONAN LU was selected as a Peter Wall Institute Wall Scholar for 2017-2018. The Peter Wall Institute for Advanced Studies (PWIAS) Wall Scholar Research Award provides support for full-time, tenured or tenure-stream UBC faculty members to spend one year in residence at the Peter Wall Institute, in a collaborative, interdisciplinary environment.

Lu is also recently received the Larry Beuchat Young Researcher Award from the International Association of Food Protection. This special award is presented to a young researcher who has shown outstanding ability and professional promise in the early years of their career.

PROFESSOR SUSAN BARR RETIRES



Food, Nutrition and Health Professor Susan Barr retired in December after 35 years with UBC.

After earning a BHE in Home Economics in Human Nutrition from UBC, a clinical dietetic internship in Alberta, and a PhD in Human Nutrition from the University of Minnesota, she joined UBC as an Assistant Professor in 1981. Barr received tenure in 1986 and was steadily promoted through the ranks, becoming a full Professor in 1995.

She studied how women's cognitions about food, eating, and body weight may have physiological implications for their health. She was also interested in dietary policy and was involved in the development of the Dietary Reference Intakes (nutrient reference standards for Canada and the United States), and was a member of Health Canada committees working on revision of Canada's Food Guide and on dietary sodium reduction.

Barr has received many awards over the course of her career, including the Earle Willard McHenry Award for Distinguished Service in Nutrition in 2015, the Obesity Society Award (outstanding journal article published in Obesity, 2007), the UBC Killam Award for Teaching Excellence (1993) and the Canadian Dietetic Association Award for Excellence in Scientific Writing (1990). ⊙

Dairy farmers should rethink a cow's curfew, says UBC researchers

RESEARCH FROM PROFESSORS in our Animal Welfare Program suggests dairy cows housed indoors want to break curfew and roam free.

The study, published in *Scientific Reports*, measured how much work dairy cows will do to access pasture, by pushing on a weighted gate. The cows worked hard to access pasture, especially at night. As a comparison, the researchers also measured how much weight the cows would push to access their regular feed when kept indoors; cows worked just as hard to go outside as they did to access fresh feed when they were hungry.

"Our findings show cows are highly motivated to be outside," said Professor Marina von Keyserlingk, the study's lead author.

von Keyserlingk said many dairy cows in Canada, the United States and other parts of the world are housed exclusively indoors. Indoor housing may meet the cow's basic needs for food, water, hygiene and shelter, but does not allow the cow to engage in natural behaviours.

"Improving the cow's quality of life is obviously important for the animal, but it's also important for the people involved, including the farmers that care for them and the consumers who buy dairy products," said co-author Professor Dan Weary.

The researchers said their findings support previous research that found public opinion of a good life for cattle involves outdoor grazing access.

The work was funded by the Natural Sciences and Engineering Research Council of Canada (NSERC) and industry contributions from the Dairy Farmers of Canada, British Columbia Dairy Association, Westgen Endowment Fund, Intervet Canada Corporation, Zoetis, BC Cattle Industry Development Fund, Alberta Milk, Valacta and CanWest DHI. ⊙

CRYSTAL KARAKOCHUK

ASSISTANT PROFESSOR, FOOD, NUTRITION AND HEALTH

"Nutrition has always been an important aspect of my life" says Crystal Karaochuk. "My older sister had Type 1 Diabetes, so I learned from an early age the importance of food and the effect it could have on health. Since I was in high school, I wanted to become a Dietitian."

Crystal is now an Assistant Professor in the Food, Nutrition, and Health department in the Faculty of Land and Food Systems. She is also Registered Dietitian with a strong interest in maternal child nutrition and global health. She holds two degrees from UBC.

Crystal's research investigated anemia, and the biomarkers of iron deficiency in women in Cambodia. She worked with the Fish on Farms Project in Cambodia, which looked at whether or not starting fish ponds could help provide women and children living in poverty with iron. "We actually discovered less iron deficiency among women than we expected, so I moved my PhD research onto another trial to investigate that finding further." Crystal went back and forth from Cambodia eight times, staying for as long as six months at a time. "It's a great country with very friendly people and a fascinating history. And ultimately, we found that anemia in Cambodian women was more often linked to genetic factors that affect hemoglobin, rather than to iron deficiency."

Crystal spent time working as a Clinical Dietitian at the B.C. Children's Hospital, before her interest in global health took her away again. She worked in New York and Timor-Leste with UNICEF, and in Rwanda, Malawi, Ethiopia, and Italy with the UN World Food Programme.

"Deciding to do my PhD at UBC was partly due to the exceptional opportunity to work on the Cambodia project alongside Tim Green. I thoroughly loved working in Cambodia, and now as a PI, I'm starting new exciting projects in other counties such as Malaysia and the DR Congo." ⊙

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