

# **Food Science Graduate Seminar Series Fall 2021**

Tuesdays from 3:45– 4:35 PM  
*7-week course, session 1*  
Stocking Hall  
Cornell University

Seminar Chair: Dr. Carmen Moraru

### Respect Statement

Diversity in the field of food science – in race, gender, sex, religion, language, ability, veteran status, place of origin, academic specialization, etc. – is an asset to our learning experience. As a result, we hope to provide an inclusive and welcoming space for our speakers to share their expertise. We want to reaffirm our commitment to speaking respectfully and mindfully to members of our Cornell community as well as our guests and note that individuals identifying with historically minoritized groups should not be expected to describe or provide perspective on these groups unless they themselves volunteer to relate their experiences. We value the scholarship of each of our speakers, and we invite our speakers in order to hear their unique contributions to the field.

Date	Speaker	Seminar Title
Aug 31	<b>Mario Herrero, PhD</b> Professor of Sustainable Food Systems and Global Change, Department of Global Development Nancy and Peter Meinig Family Investigator in the Life Sciences Cornell University	“The Sustainable Transformation of Food Systems”
Sept 7	<b>Alexander Mathys, PhD</b> Professor ETH Zurich	“Novel food production technologies for more sustainable food systems”
Sept 14	<b>Rebecca Nelson, PhD</b> Professor Cornell University	“Sorting out Toxic Food Systems: Selected strategies to reduce mycotoxin exposure in low-resource settings”
Sept 21	<b>Yuanyuan Li</b> PhD Candidate, Padilla-Zakour Lab Cornell University	“Investigating Novel Processing Methods to Develop Minimally Processed, Nutritious Concord Grape Products With Extended Shelf-Life”
Sept 28	<b>Michael Hoffman, PhD</b> Professor Emeritus, Cornell University Executive Director Emeritus, Cornell Institute for Climate Smart Solutions	“Our Food, Our Future”
Oct 5	<b>Bauman Lecture</b> <b>Catharine Ross, PhD</b> Professor of Nutrition and Philosophy Dorothy Foehr Huck Chair Head, Department of Nutritional Sciences The Pennsylvania State University	(Title pending)
Oct 12	<b>Fall Break</b>	
Oct 19	<b>Ebenezer Miezah Kwofie, PhD</b> Assistant Professor University of Arkansas	“Sustainable Healthy Diets: Examining the Trade-offs of Processing, Nutrition and Environmental Sustainability”

## Mario Herrero



Prof. Mario Herrero is a professor of sustainable food systems and global change in the [Department of Global Development](#), a Nancy and Peter Meinig Family Investigator in the Life Sciences, and the university's second Cornell Atkinson Scholar. He is a leading global expert in sustainable food systems, who joined Cornell this summer. Previously, he was chief research scientist of agriculture and food for the Commonwealth Scientific and Industrial Research Organization (CSIRO) in Australia.

A leading global expert in sustainable food systems, he is conducting research in the areas of sustainable agriculture, climate mitigation and adaptation, livestock systems, and healthy and sustainable food systems. Prof. Herrero serves on the editorial boards of prestigious journals such as The Lancet Planetary Health, Agricultural Systems, Global Food Security, Agriculture and Food Security, Frontiers in Sustainable Food Systems, and has also been a guest editor for Proceedings of the National Academy of Sciences (PNAS). He is a corresponding fellow of the Royal Society of Edinburgh, an associate fellow of the international affairs think tank Chatham House, and an honorary professor of agriculture and food innovation at the University of Queensland, Australia.

### “The Sustainable Transformation of Food Systems”

## Alexander Mathys



Prof. Dr.-Ing.

Alexander Mathys is food technologist and received his doctoral degree in food processing in 2008. He is Professor in Sustainable Food Processing at ETH Zurich, Switzerland since 2015, where he is working on more efficiency and sustainability of value chains in food and feed. Dr. Mathys is the author of 80 publications, 9 book chapters, and 11 patents. He was Winner of the International IFT Food Security Award 2020 and “Young Researcher” of the 60th Meeting of Nobel Laureates 2010.

### **Novel food production technologies for more sustainable food systems**

Food systems are at the heart of our UN Sustainable Development Goals (SDGs). The wide scope of the SDGs calls for holistic approaches that integrate ‘siloe’d food sustainability assessments in order to develop solutions able to change complex food systems. Despite numerous developed solutions the problems associated with the excessive use of natural resources for food production, high consumption of animal-based products, and food waste are not solved. Such problems are considered as one of the most crucial for our global food systems and sustainable development.

The alliance of novel production technologies with integrated sustainability assessment in real time and further data integration into national food systems through nutritional, environmental and social indicators could be a basis for the holistic development of more sustainable food systems. For emerging production systems, holistic life cycle sustainability assessment, aligned with introduced process innovations, can evaluate the suggested solutions on a multi parameter base, in terms of sustainability of improved food production.

Based on this system understanding, focus for innovative system changes is laid on alternative protein rich foods and food waste reduction by considering more sustainable food processing and production. Advanced approaches relying on innovative raw materials from insects and single cells, with a case study on microalgae, and their connected biorefinery concepts are the basis of these actions. By using novel proteins from microalgae and insects, cultivated on waste streams, food security and sustainability of the protein supplies could be significantly improved. Selected implementation initiatives of these science-driven innovations with relevant industry partners and start-ups demonstrate the impact and relevance for the food sector.

**Rebecca Nelson**

Rebecca Nelson is Professor in the School of Integrative Plant Science at Cornell University. She co-chairs the Cornell Atkinson Center's Food Security Working Group and the Sustainable Agriculture and Food Systems thematic group of the UN's Sustainable Development Solutions Network. Her laboratory works on plant disease resistance and mycotoxin management, and on circular economy for organic resources, with a special interest in resource recovery from sanitation to agriculture. From 2000-2021, she served as Scientific Director for The McKnight Foundation's Collaborative Crop Research Program, a grant-making program focused on supporting smallholder farmers' agroecological transitions in Africa and in the Andes. She has worked at the International Potato Center in Lima, Peru and at the International Rice Research Institute in the Philippines. Rebecca received her BA from Swarthmore College and her PhD from the University of Washington. She was a MacArthur Fellow from 1996-2001.

**Sorting out Toxic Food Systems: Selected strategies to reduce mycotoxin exposure in low-resource settings**

## Yuanyuan Li



Yuanyuan Li is a PhD student studying in Professor Olga Padilla-Zakour's lab. Her research focuses on utilizing novel processing technologies, especially high-pressure processing, pulse electric field and microwave-vacuum drying, to develop minimally processed, nutritious Concord grape products with extended shelf-life.

Before coming to Cornell University, Yuanyuan worked in Sino-Africa joint research center, Chinese Academy of Sciences for three years. She worked as a program coordinator since the kick-off of the joint research center. She assisted in program development; coordinating in international collaborations with 15 African universities and institutes, mainly from Kenya, Tanzania and Ethiopia; in charge of international student affairs and education which by now has offered MS/PhD scholarship to more than 150 African students; assist in course development, evaluation and teaching, from which she found her dedication in education, joy and fulfilment of working with students. To this end, she chose to pursue her PhD in US and planning to work in academia in the future.

### **“Investigating Novel Processing Methods to Develop Minimally Processed, Nutritious Concord Grape Products With Extended Shelf-Life”**

Concord grapes are widely planted in the finger lakes area of New York where they are processed into traditional value-added products such as juice, jelly and wine. Current processing techniques applied may result in quality degradation, especially loss of nutrients due to extended heating; high-sugar and low fiber content; waste production; additives and preservatives addition for shelf-life extension. To meet consumers' demand for products that are minimally processed, having fresh-like and health-promoting attributes, it is imperative to investigate novel processing methods to develop nutritious, convenient and versatile Concord grape products. Grape skin and seeds are considered by-products in juice and wine production. Instead of being left behind as waste, these antioxidant-rich raw materials could be utilized in developing value-added products, eliminating waste and supporting sustainability. Traditionally, thermal processing and hot air drying provide safe grape products while extending the shelf-life. However, heat may negatively affect the organoleptic properties and the nutritional composition of final grape products. Nonthermal technologies are promising alternatives to preserve organoleptic, nutritional and sensorial attributes. This work focuses on utilizing novel processing methods (high-pressure processing, pulse electric field, microwave-vacuum drying) in developing nutritious Concord grape products that meet current consumers' demands.

## Michael Hoffman



Mike Hoffmann raises awareness of climate change through the foods we love and need. It's a science-based message about what is happening and what we all can do about it. He has published climate change articles in the popular press - The Hill, Fortune, Medium, and USA Today and is lead author of - [Our changing menu: Climate and the foods we love and need](#) (Cornell Press 2021). His TEDx Talk - [Climate change: It's time to raise our voices](#) has been well received. Previous positions he has held at Cornell include Executive Director of the Cornell Institute for Climate Change Solutions, Director of the Cornell University Agricultural Experiment Station, associate dean of the College of Agriculture and Life Sciences, associate director of Cornell Cooperative Extension, and director of the

New York State Integrated Pest Management Program. He is a Professor Emeritus in the Department of Entomology. He received his BS Degree from the University Wisconsin, MS from the University of Arizona, and PhD from the University of California, Davis.

### Our Food, Our Future

Of the many challenges we face, climate change looms larger every day. U.N. Secretary General António Guterres stated the global prognosis clearly: "The point of no return is no longer over the horizon. It is in sight and hurtling towards us." To raise more awareness and action we are using **Our Food**, to tell the climate change story. Plants, the basis of life, require the right temperatures, water, soil, and air but all are changing and having subtle to ominous impacts on our food—from spices and herbs to nuts. Addressing this challenge requires innovative research to develop more resilient crops, better practices and tools that help the agricultural and the food sectors adapt to the new normal and mitigate their impact. This is also an opportunity for all of us, from farmer to consumer, to find our common ground and draw more attention and action to address this grand challenge of our time. We all eat and need to step up from the sideline and create change. We can all make a difference—**Our Future**.



College of Agriculture  
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Food Science

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## Fall 2021

**Catharine Ross**

**(Title pending)**

## Ebenezer Miezah Kwofie



Dr. Ebenezer Miezah Kwofie is an assistant professor of food systems sustainability and resilience at the University of Arkansas, Fayetteville. He holds a joint appointment at the Biological and Agricultural Engineering, Chemical Engineering, and the Food Science Departments. He has PhD in Bioresource Engineering from McGill University, Canada. Prior to joining the University of Arkansas, he was a Research Associate at the Food and Bioprocess Research lab at Bioresource Engineering Department, McGill University, where he served as manager for International Food Systems Development projects, working in developing countries including Zambia, Malawi, Ethiopia, Bolivia, and Honduras. These projects were focused on enhancing food systems sustainability and strengthening capacity of stakeholders (farmers, farmer cooperatives, small-scale food enterprises, NGOs, and local government departments).

Dr. Kwofie's research explores the connectivity and dynamics of environmental, economic, and product-process efficiency to address food system sustainability and resilience. His research applies life cycle thinking to evaluate trade-offs of food process, nutritional quality, and environmental impact. Additionally, he focuses on industrial eco-efficiency optimization through techno-eco-environmental modelling and sustainability decision analysis of food and bioproducts across their value chains.

### **Sustainable Healthy Diets: Examining the Trade-offs of Processing, Nutrition and Environmental Sustainability**

Production and consumption of sustainable healthy diets are the desired outcome of the food system. In the last decade, consumer demand for nutritious and environmentally sustainable diets has increased considerably. Navigating the health-environmental dynamics is becoming essential in consumer food choices because healthy foods may not necessarily be sustainable, and vice versa. For household meal preparation, the impact of processing significantly changes this environmental nutrition relationship. In low resource setting communities, the processing choices further complicate this relationship because of the socioeconomic implications. Examining the dynamics and the associated trade-offs of this complex network is critical and could be an important pathway for transitioning towards sustainable healthy diets. Using the common bean value chain as a case study, we will examine the impact of processing on nutritional and nutraceutical quality, and explore the dynamics of the trade-offs of processing, nutrition, environmental sustainability, and the socioeconomic implications of such processing choices in a low resource setting community.



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