



## Graduate Programs

# I am interested in studying Human Nutrition

## Graduate Programs Related to Nutrition

The University of Guelph has an outstanding reputation for excellence in biological and social sciences, especially as they apply to human nutrition and well-being. Our faculty and facilities in these disciplines are amongst the best in the world, and provide excellent support for graduate student research. At the University of Guelph, you can choose from a variety of graduate programs that will allow you to investigate multi-disciplinary issues across the full spectrum of human nutrition and health. We encourage you to learn more about our graduate programs.

[www.uoguelph.ca/graduatestudies](http://www.uoguelph.ca/graduatestudies)

## See what we have on our plate



Nutrigenomics

Cellular

Metabolic

Animal Models

Human Models

Functional Foods & Nutraceuticals

Physical Activity & Exercise

Clinical

Community

Population

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## NUTRIGENOMICS

### Human Health & Nutritional Science MSc, PhD

Students explore the role of nutrition in health and disease with genetic, genomic, proteomic, and metabolomic approaches. These approaches are widely used to better understand the efficacy of dietary interventions, identify novel biomarkers that reflect molecular processes and tissue function, and determine how nutrition can influence risk factors for cardiovascular disease, diabetes, and cancer. Nutrigenomics research is conducted in a variety of experimental contexts, ranging from cell culture systems to animal models to human clinical interventions. Examples include: studying how dietary fat, phospholipid and carbohydrate/fibre metabolism affect gene expression, protein synthesis, and tissue function.

### Bioinformatics MSc, MBinf.

Bioinformatics is a unique interdisciplinary program that teaches the application of the latest computational and statistical techniques to nutrigenomics data including, genetics (DNA variation), epigenetics (DNA methylation), gene expression (RNA), and metabolism (metabolomics, systems biology) to solve problems at the cutting edge of human and animal health. Students in this program will be guided by an interdepartmental supervisory team to extend their undergraduate expertise into a comprehensive bioinformatics education.

### Mathematics & Statistics MSc, PhD

The Department of Mathematics and Statistics offers MSc and PhD degrees that present the opportunity to specialize in a variety of areas. A number of faculty within the department are working in nutrigenomics, bioinformatics, biomathematics and biostatistics, with applications in areas such as clinical trials, the study of diseases, the modelling of ecological systems and food safety. Students have the opportunity to pursue a thesis (MSc or PhD) or a major research paper (MSc).

## CELLULAR

### Food Science MSc, PhD

Food Science research focuses on in-vitro studies on the effects of nutritional components in foods at a cellular level. Compounds found in dairy and eggs are commonly investigated.

### Human Health & Nutritional Science MSc, PhD

Human Health and Nutritional Science investigates the biological roles of nutrients at a molecular and cellular level. Research programs investigate how nutrients affect processes in cellular differentiation, cell proliferation, energy metabolism, and cell death. Researchers focus on fatty acids, Vitamin D and chemotherapeutic drugs in cancer prevention and treatment, niacin and signal transduction and DNA repair and how lipids modulate membrane structure, protein function and gene expression.

## METABOLIC

### Applied Human Nutrition MSc, PhD

Faculty and graduate students in Applied Human Nutrition conduct research related to the effects of diet, exercise, supplements and/or medication on various aspects of human health, particularly metabolism and body composition.

### Food Science MSc, PhD

Manipulation, digestion and absorption of specific compounds in foods are extensively studied in Food Science research. This research is often done in collaboration with researchers in other disciplines, particularly in Human Health and Nutritional Sciences.

### Integrative Biology MSc, PhD

Research in the laboratory of Dr. N. Bernier involves identifying and understanding the neuroendocrine pathways involved in the regulation of appetite and growth in fish. The goal of this research is to elucidate the basic neural circuits and endocrine signals that regulate appetite and growth in response to different diets, feeding regimes and various environmental and anthropogenic stressors.

### Molecular & Cellular Biology MSc, PhD

Dean Michael Emes and Dr. Ian Tetlow lead a multidisciplinary team involving faculty and researchers from across campus studying the health benefits of incorporating

Resistant Starches in the diet. These important carbohydrates have several health benefits including lowering the risk of diabetes and colorectal cancer. Emes and Tetlow focus on understanding how crops can be modified to make more Resistant Starch and also collaborate closely with a major food company.

## ANIMAL MODELS

### Animal & Poultry Science MSc, PhD

Researchers in Animal and Poultry Science are using animal models to explore a wide area of nutritional research. Specific projects include, using pigs as a model for a variety of human inflammatory bowel diseases in order to explore dietary interventions to improve gut health, and using mice as a model for gene expression studies in mammary tissue to explore nutritional influences on milk composition.

### Food Science MSc, PhD

Using animal models, Food Science researchers are involved in studies investigating allergens in foods. Food safety research into the progress of food borne illnesses through the gut is also investigated.

### Human Health & Nutritional Science MSc, PhD

The faculty of Human Health and Nutritional Science use animal models to study a wide range of nutritional related topics studying the effects of diet and exercise on health and performance. These topics include: the effects of exercise and diet on adipose tissue function and metabolism, how fats and carbohydrates are used as fuels in contracting skeletal muscle, endurance training, obesity and diabetes, the study dietary fatty acids in breast cancer, bone development, Alzheimer's disease and the effect of niacin deficiency and pharmacological supplementation on the development of memory and learning.

### Integrative Biology MSc, PhD

Research in the laboratory of Dr. N. Bernier involves identifying and understanding the neuroendocrine pathways involved in the regulation of appetite and growth in fish. The goal of this research is to elucidate the basic neural circuits and endocrine signals that regulate appetite and growth in response to different diets, feeding regimes and various environmental and anthropogenic stressors.

### Plant Agriculture MSc, PhD

Members of the Plant Agriculture department, in collaboration with faculty in other departments, are comparing the efficacy of diets from vegetables, fruits and field crops to support growth and prevent diseases in animals.

## HUMAN MODELS

### Applied Human Nutrition MSc, PhD

Faculty and graduate students in Applied Human Nutrition are involved in diversity of research projects including randomized controlled trials related to family-based obesity prevention; developing interventions to reduce TVs in young children's bedrooms; and establishing nutrient requirements for nutrients such as zinc.

### Food Science MSc, PhD

Food Scientists use clinical trials to study the impact of foods and ingredients on human health and well being. Research spans the study of specific compounds in foods and their effect on health through to identifying new foods and ingredients that may be beneficial for health.

### Human Health & Nutritional Science MSc, PhD

Humans are studied to examine the individual or combined effects of diet and exercise in mediating metabolic processes in health and chronic disease such as, cardiovascular disease, obesity, metabolic syndrome, diabetes and cancer. Human Health & Nutritional Science study how fats and carbohydrates are used as fuels, the regulation of adipose and the impact of caffeine or coffee ingestion on carbohydrate metabolism and insulin sensitivity. We also study the role of specific foods (e.g. functional foods) and food constituents (e.g. nutraceuticals) in the reduction of chronic disease risk.

### Molecular & Cellular Biology MSc, PhD

Dr. Emma Allen-Vercoe leads a research team studying the normal human microflora and its influence on human health and disease.

## FUNCTIONAL FOODS & NUTRACEUTICALS

### **Animal & Poultry Science, MSc, PhD**

Researchers in Animal and Poultry Science are at the forefront of collaborative work on developing novel food products through enriching the diets of the animals producing those food products. Recent examples include, enriching the diets of dairy cows to produce omega-3 enriched dairy products, and enriching the diets of laying hens to produce omega-3 and lutein enriched egg products.

### **Applied Human Nutrition MSc, PhD**

Faculty and graduate students in Applied Human Nutrition conduct research on topics such as consumer attitudes and their understanding of functional foods and organic foods and related policy implications.

### **Food Science MSc, PhD**

Food Science research in the area of functional foods involves studying the inclusion of new and novel ingredients into foods. The effects of these ingredients on health are also investigated.

### **Human Health & Nutritional Science MSc, PhD**

Graduate opportunities in Functional Foods and Nutraceuticals range from the study of health benefits of micronutrient and food intake and the use of natural health products (prevalence, associated attitudes and beliefs) in healthy and clinical populations, to the study of novel encapsulation strategies which optimize the stability, delivery and absorption of nutraceuticals for use in supplements or as food ingredients. Functional Foods and Nutraceuticals are studies using cell culture, animal and human models.

### **Integrative Biology MSc, PhD**

The Centre for Biodiversity Genomics (CBG) is a leading innovator of DNA-based methods used for species identification. Dr. Hanner and Dr. Newmaster, along with colleagues at the CBG, are pioneers of research and development that combines molecular barcoding techniques with bioinformatics tools for the purpose of food product authenticity testing. These tools are being used to investigate the incidence of consumer food fraud in the marketplace (e.g. tea, herbal products, alternative medicines, non-timber forest products NTFPs and seafood). Their approaches have serious implications for trade industry and government policy, both in Canada and internationally.

### **Physics MSc, PhD**

The problem-solving skills and interdisciplinary approach of a Physicist are ideally suited to tackle challenging issues in human nutrition at a quantitative level. At Guelph there is a strong tradition of collaboration with the biological sciences and food sciences through the Biophysics Interdisciplinary Group. Relevant research areas in the department include: experimental and computational work on biological self-assembly, nanoencapsulation systems for the delivery of bioactives, and high resolution structure measurements (AFM, NMR, X-ray) of proteins and biomaterials on the nanoscale.

### **Plant Agriculture MSc, PhD**

Faculty and students in Plant Agriculture conduct research on breeding crops for improved human nutrition and evaluate the effects of genetics and the environment (pre and postharvest) on nutrient and nutraceutical levels in vegetables, fruits and nuts.

## PHYSICAL ACTIVITY & EXERCISE

### **Applied Human Nutrition MSc, PhD**

Faculty and graduate students in Applied Human Nutrition conduct research on topics such as physical activity promotion among youth and in ethno-cultural communities and the effects of exercise on metabolism and body composition.

### **Human Health & Nutritional Science MSc, PhD**

The Department of Human Health and Nutritional Science focuses on skeletal muscle metabolism, and how fats and carbohydrates are used as fuels in contracting skeletal muscle and mitochondrial metabolism under healthy resting conditions, as well as being perturbed by exercise. Human Health and Nutritional Science also study the effects of ergogenic aids on whole body exercise performance and metabolism.

## CLINICAL

### **Applied Human Nutrition MSc, PhD**

Faculty and graduate students in Applied Human Nutrition conduct health care research such as, studies of gestational diabetes, the role of dietitians in primary care, obesity management studies in primary care, and improving nutrition in various conditions.

## COMMUNITY

### **Applied Human Nutrition MSc, PhD**

Faculty and graduate students in Applied Human Nutrition conduct research at the community level in collaborations with local communities, Public Health, and various government ministries. Projects, in diverse communities, include evaluating daily physical activity policy in elementary schools, physical activity interventions, consumer research on vegetable consumption, nutrition risk screening (children and adults), and obesity prevention.

### **Business Administration MBA**

Within the MBA, Food & Agribusiness, projects aim to develop community-based business solutions to hunger and nutrition issues in developing countries. Projects will include: cooperative models to improve scale economies of small farms, storage and processing solutions to resolve high levels of spoilage, marketing and distribution models for micronutrients, new credit and crop insurance models.

### **Capacity Development & Extension MSc**

Capacity Development and Extension explores the opportunity for facilitating learning, communicating and building capacity that supports food systems at different levels of society including the household, nationally and internationally. Our program is learner-oriented in order to accommodate student research in a wide range of possible topics involving the human and social side of food issues such as, local food systems, ethnocultural crops and interactions that share knowledge and engage the wider society in how food is produced, processed, marketed and consumed in Canada and around the world.

### **Geography MA, MSc, PhD**

A number of researchers in the Department of Geography, including a Canada Research Chair in Global Human Security, have active research programs focused on contemporary food production systems. The department of Geography offers an ideal home for those who are interested in understanding and overcoming challenges faced by the global food system to deliver appropriate nutrition for 9 billion people in a way that does not compromise vital ecosystem services including biodiversity conservation and carbon sequestration.

### **History MA, PhD**

Understanding nutrition in a historical perspective is fundamental to understanding nutrition itself. The science of nutrition and nutritional advice has changed over time and is influenced by contemporary political, social, and cultural values. Students in the Tri-University History program examine, not only the science of nutrition, but also focus on how the rhetoric of nutrition is used by food manufacturers, advertisers, and consumers.

### **Rural Planning & Development MSc**

Rural Planning and Development students learn how to assess nutrition needs and levels, determine programming needs, design and evaluate community nutrition programs and assess the community impact of presence or absence of nutrition programming.

## POPULATION

### **Applied Human Nutrition MSc, PhD**

Faculty and graduate students in Applied Human Nutrition conduct research at the population level including, health and physical activity promotion, nutrition surveillance, analysis of national health surveys, and policies related to the promotion of vegetables.

### **Rural Planning & Development MSc**

Nutrition levels in rural communities are assessed by students in Rural Planning and Development. Strategies are developed to reduce the impact of poverty on nutrition. Nutrition programs take into account how local food strategies are designed, implemented and evaluated.





[www.uoguelph.ca/graduatestudies](http://www.uoguelph.ca/graduatestudies)

## I want to become a Dietitian in Ontario

Dietetics is a regulated health profession like other health professions such as, nursing and pharmacy. Students must complete an accredited program. The most direct route to becoming a dietitian (for English-speaking students in Ontario) is to complete the undergraduate degree from one of the three Dietitians of Canada (DC) accredited programs (Ryerson, Brescia or Guelph), followed by a post-baccalaureate accredited dietetic internship. After successful completion of the internship, applicants are eligible to write the Canadian Dietetic Registration Examination administered by the College of Dietitians of Ontario ([www.cdo.on.ca](http://www.cdo.on.ca)).

### You can learn more online

Applied Human Nutrition Program requirements: [http://www.uoguelph.ca/undergrad\\_calendar/10basc-ahn.shtml](http://www.uoguelph.ca/undergrad_calendar/10basc-ahn.shtml)

Admissions: <https://admission.uoguelph.ca/home.aspx>

Advanced Standing Admission: [http://www.uoguelph.ca/undergrad\\_calendar/04-advdstand.shtml](http://www.uoguelph.ca/undergrad_calendar/04-advdstand.shtml)

## Graduate Studies Preview Day - Saturday, October 26th, 2013

Join us for Graduate Studies Preview Day and meet with faculty, staff and current graduate students in your program of interest.

Sign up for a reminder email online at: [www.uoguelph.ca/graduatestudies](http://www.uoguelph.ca/graduatestudies)

### Campus Tours

Learn more about what the University of Guelph has to offer by visiting us. We offer campus tours Mon-Fri at 10:00am and 1:30pm and Saturday at 1:30pm. Please email: [tours@registrar.uoguelph.ca](mailto:tours@registrar.uoguelph.ca) with the date and time you would like to visit and we will arrange your tour.

### Spotlight on Faculty & Graduate Students

Interested in learning more about the research interests of faculty members and what our graduate students have to say about the University of Guelph? Visit us online at: [www.uoguelph.ca/graduatestudies](http://www.uoguelph.ca/graduatestudies)

### Contact Us

Thank you for taking the time to research the University of Guelph. If you have any questions please do not hesitate to contact us.

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