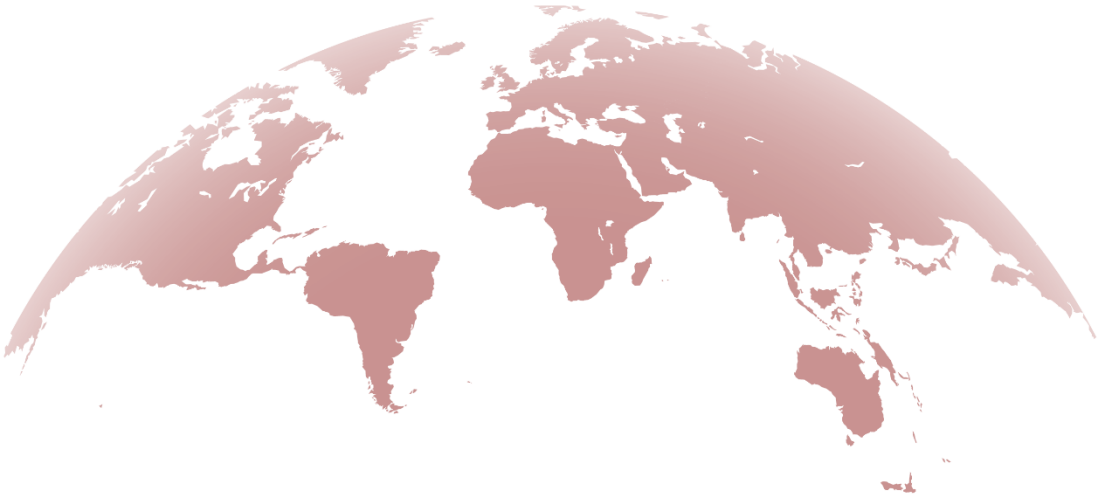


PhD Tour East Canada 2019

EyeQuestion nzo PROEFSCHRIFTMAKEN Meijer en Meijaard i-Design Ausnutria NUTRITION INSTITUTE PhDTour2019 WAGENINGEN UNIVERSITY & RESEARCH

Preface

We are happy to present you the report of our PhD tour through Canada. From October 20, until November 2 2019, we have been travelling through this beautiful country. During these two weeks, we visited ten institutes. In this report, we provide you a summary of the scientific content of these days. We gratefully thank the companies that sponsored us: EyeQuestion, NZO, i-Design, Ausnutria, Proefschriftmaken, and Meijer en Meijaard. Without your generosity this tour would not have become reality. We hope that this reports shows you the value of your support. We also thank our funders from within the university: graduate school VLAG, LEBfonds, and of course our own department of Human Nutrition and Health. Finally, thanks to all the universities, companies and institutes that hosted us: INAF, Quebec Heart and Lung institute, Université du Québec à Trois-Rivières, McGill University, uOttawa, Health Canada, Dare Foods, University of Waterloo / RIA, McMaster University and University of Guelph. Your efforts in composing interesting programs and in creating a great atmosphere for connecting was highly appreciated by all of us!

On behalf of all the participants,

The PhD-Tour board: Pol Grootswagers, Rachelle de Vries, Arli Zarate Ortiz, Paulina Morquecho Campos, Elbrich Postma, Moniek van Zutphen and Vera Wesselink

Program / table of contents

October 21: Université Laval – INAF

The first day of science of the PhDtour 2019 to Canada! After only a few hours of sleep (jetlag..), we started off with a good breakfast and made our way to INAF at Laval University. There we received a very warm welcome and a gift in the form of an apron and a bag. Soon the science started.

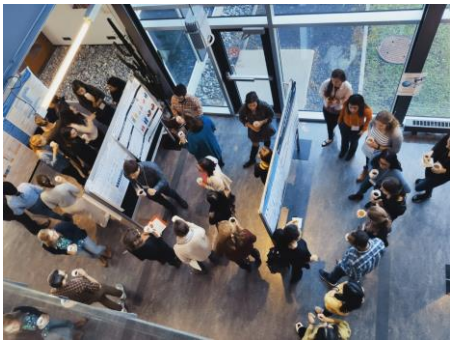


The treat of the whole day was collaboration. Similar to Wageningen University, INAF and Laval University have many connections with industry, hospitals and public health institutes. Besides, they organize very nice activities for the Quebec population such as a summer cooking camp for children during which they discover foods and their origins and learn to prepare a healthy meal together with a chef.



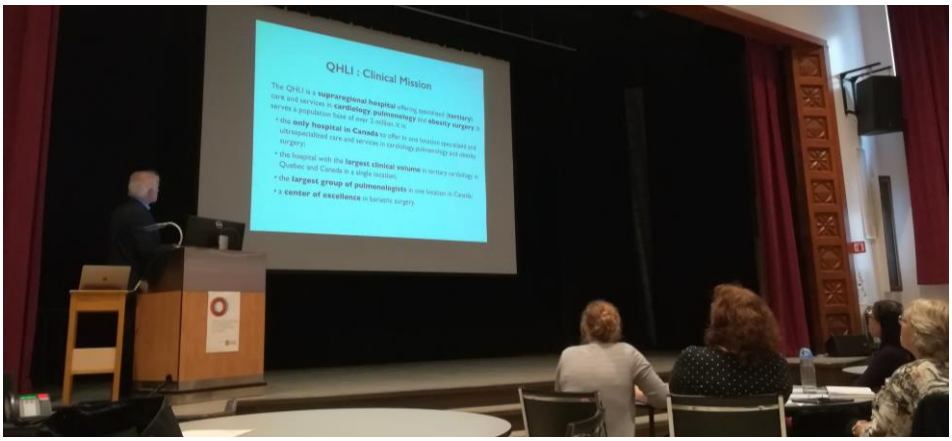
We heard a great variety of research topics like sensory and behavioral sciences, responders and non-responders and fatty acids. During the breaks, we also had to chance to connect and share our research with the Laval PhD students by means of poster presentations. We ended the official programme with a tour of the human and laboratory facilities, Els (and we also) were amazed by their kitchen capacity. The human research facility is the largest one in Canada and has much to offer. Also in the lab, they have some highly specialized machines.

Lastly, we had some nice drinks and bites together and looked back on a great first day!



October 22: Quebec Heart and Lung Institute

After some searching and a walk through a long tunnel in the hospital, we were welcomed by Denis Richard and André Tchernof who told us that the Laval University was established in the same year as the WUR, 101 years ago.



The Heart and Lung Institute is located at the hospital and has three main research areas in tertiary care: cardiology, respiratory and obesity surgery. They have a large biobank with over 107.000 samples of 25.000 people, giving access to much data from for example conducted cohort studies. Just like we have Renger Witkamp, QHLI has Vincenzo di Marzo as a specialist in endocannabinoids.

Benoit Arsenault talked about developing medicines to prevent the progression of aortic stenosis by mimicking the natural successes of the human genome. Lp(a) inhibitors could be tested in an RCT, supporting further research on the potential usefulness of cascade screening. He is searching for PhDs and postdocs.

Two PhD-students of QHLI focussed on bariatric surgery, which is also the topic of one of our PhD's. Sylvain Iceta studies MRI and obesity, neuroinflammation and cognition: the impact on weight loss after batritiac surgery. Paulette Mukorako looks at gut microbiota contribution in metabolic outcomes of malabsorptive bariatric surgeries in rats, showing that GLP-1 and PPY surgeries show increased butyrate and propionate production compared to other surgeries. Soon results in humans will follow.

Two people talked about the effects of cranberry polyphenols. Béatrice Choi presented the effect of a polyphenol-rich cranberry extract and showed that it reduced weight loss in obese mice exposed to persistent organic pollutants, perhaps as a protective mechanism against releasing high levels of POPs. Laurence Daoust showed that early cross-fostering transfer of gut microbiota reveals sex-specific effects of cranberry polyphenols in a mouse model of diet-induced obesity.

Various other topics were presented. Sofia Laforest talked about steroids in mammary adipose tissue: relationships with adiposity and breast cancer features, while Romain Villot presented that highly expressed RAS/PI3K signaling induces senescence via depletion of the ZNF768 transcription factor. Rim Ben Necib investigated the effects of whole hemp seed dietary supplementation on the microbiome-endacannabinoid axis in mice and its implications in diet-induced obesity. Ina Maltais-Payette studied the pathophysiology of the association between circulating amino acids and obesity: role of dietary intakes.

Of course many of us also presented research, from lipids and life after cancer diagnosis, to GABA from tomatoes and potatoes to the role of sweeteners, which generated interesting questions from the public.

After another tasty lunch, and a first introduction to maple leafs on a brief lunch walk, Denis Richard showed us the imaging laboratories, which were combined with blood drawing and exercise rooms. They had a CT and MRI scanner, both used for research purposes only. Besides research in among others obese individuals, cardiovascular patients and healthy persons, animals such as sheep and pigs are studied as well.

After a beautiful bus ride through the forest we arrived at Trois Rivieres, where we already met some researchers from the university who joined for a tasty Canadian meal at a brewery, before we reached the next hotel.

Tour of imaging labs

Group picture

Maple forest lunch walk

Chairs suitable for obese people

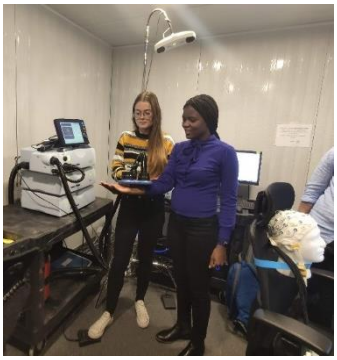
October 23: Université du Québec à Trois-Rivières

Today, we were in UNIVERSITÉ DU QUÉBEC À TROIS-RIVIÈRES (UQTR). The day included presentation sessions in the morning, and a lab tour and a networking session (drinks!) in the afternoon. The day started with a very interesting talk given by Prof. Johannes Frasnelli, UQTR Research Chair in Chemosensory Neuro-anatomy (picture below). He introduced the his main research topics, including trigeminal system, brain anatomy and olfaction. His way of humor was impressive, for example considering the nose as a cathedral.

After the talk from Johannes, Edith Feskens introduced WUR and the PhD tour. Her talk was followed by presentations of three PhD candidates from the chair group Sensory Science and Eating Behaviour (HNH, WUR), as well as presentations of four PhD candidates from UQTR.

<u>WUR presentations</u>: Elbrich Postma presented her study on *smell and taste disorder: effects on food preferences, eating behavior and the brain*. She found that in patients with smell lose, the brain still reacted to odors. In addition, people who lost their sense of smell at a later age and people with congenital smell loss showed different food preferences. Rachelle de Vries gave a presentation on *Foraging Minds in Modern Environments: Multisensory Investigations into a High-calorie Bias in Human Food Spatial Memory*, and showed that a spatial memory bias for high-caloric foods exists in humans. Paulina Morquecho Campos presented her work entitled *Do we respond to food cues like Pavlovian dogs?* In her work, participants were exposed to four levels of exposure to foods (from vision to chewing). Higher level of food exposure increased the amount of saliva secretion, while the α-amylase concentration did not differ.

UQTR presentations: Vincent Lemieux gave an overview of Le Loricorps: Intégration du Recherche-Formation-Intervention, a transdisciplinary research group, and on intuitive eating in eating disorders. Chloé Migneault-Bouchard gave an presentation on *chemosensory decrease in different forms of olfactory dysfunction*, and found that three chemical senses are closely connected. In case of olfactory dysfunction, the remaining chemical sense tends to decrease rather than compensate. Cindy Levesque-Boissonneault presented her work on *clinical outcomes after chemoradiotherapy for H&N cancer following swallowing group therapy: a retrospective cohort study*. Compared to individual therapy, group therapy showed more positive effects (e.g. less severe dysphagia during and after the radiotherapy). Benoît Jobin gave an presentation entitled *How can we improve intranasal trigeminal sensitivity assessment?* He proposed two new methods to measure trigeminal sensitivity. Besides being as effective as the standard method, the 20-stimulations method is the shortest method.



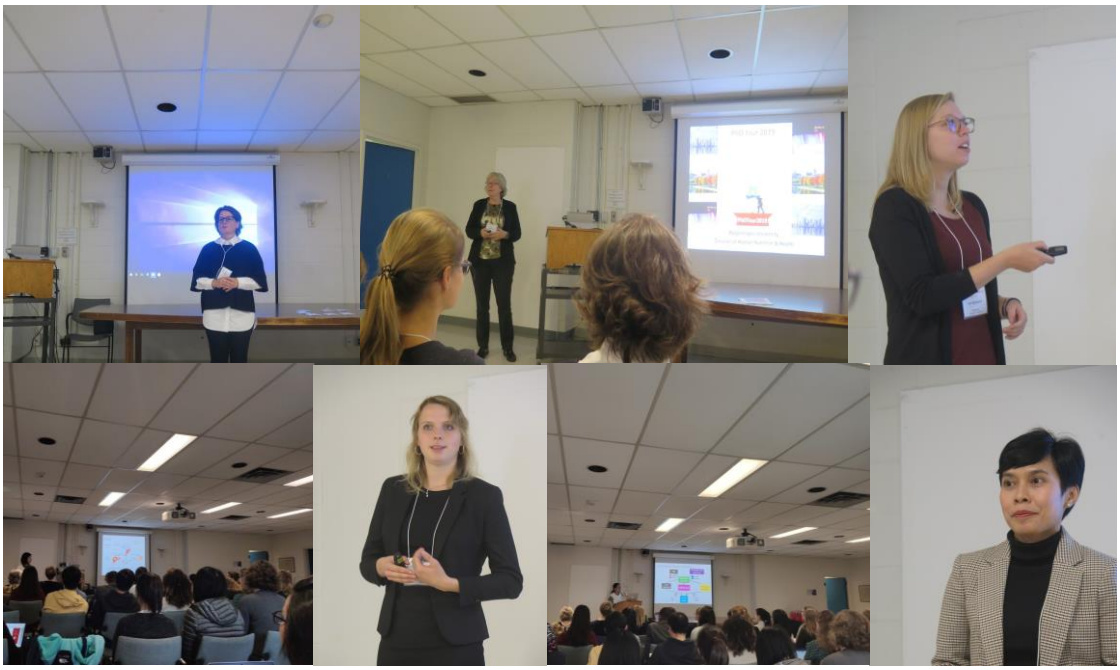
In the afternoon, a tour to the facilities of neuroscience was guided by Johannes and his PhD students. Olfactometer and EGG were combined to study olfaction and brain signal. They also showed us some interesting techniques; for example, they showed us the transcranial magnetic simulation to stimulate the neuro-system, resulting in body movement and even a change in the personal perception (potentially useful to treat depression). In addition, we were allowed to take a look in the anatomy facility. Medical sciences students studied and practiced their skills on human bodies. There were also real human brains in the facility. Who wished to, was allowed to put on a pair of gloves and touch the brains. The anatomy facility was accompanied by the slogan *Hic locus est ubi mors gaudet succurrere vitae*, meaning "this is the place where death is used to help life".

After the intensive, but very interesting and fun program, we gathered at the student pub. With a cup of enjoyable beer in the sunshine, we were able to network with people from UNIVERSITÉ DU QUÉBEC. In general, this is an amazing day on human olfaction, anatomy and psychology.

October 24: McGill University

After a cosy night sharing beds, some breakfast troubles and a fine for wrong bus parking, we drove to McGill University. The last few minutes of our ride to the McGill Macdonald Stewart campus were filled with lots of 'ahhs' and 'oo's' because of the beautiful scenic view filled with large houses near the river and squirrels in the autumn coloured trees. We arrived at a very beautiful largely stretched campus and were warmly welcomed.

The day started with an introduction of McGill and Wageningen University by Stéphanie Chevalier and Edith Feskens. Thereafter, we had several presentations on different topics. During the first part of the morning students presented topics that included dietary triggers in Irritable Bowel Syndrome (Iris Rijnaarts), the impact of anthocyanin on polychlorinated biphenyl induced intestinal dysbiosis (Fang Lu), the implicit and explicit associations between healthiness and tastiness of foods in families with a lower socioeconomic position (Amy van der Heijden), alleviation of hypoaminoacidemia by parental amino acid infusion during intensive insulin therapy (Mengyin Hong) and lactose prevalence in the Indonesian elderly population (Estika Dewiasty).



After a small break, it was time for the first pitch session of this tour. Five WUR PhD students gave a 3-minute pitch on their PhD project. Anouk Gijbels pitched on the PERSON study-PERSonalized glucose Optimization through Nutritional intervention, Xiaolin Li on the gut-brain axis during cachexia, Ruoxuan Deng on the investigation of gastric digestion by a combination of in vitro and in vivo approaches, Inge Groenendijk on her systematic review and meta-analysis on protein intake in elderly to improve their bone health and Marion Buso on sugar, sweeteners in diet products and their effect on weight regulation.

After these pitches, the program continued with 15-minute presentations by four students. Arli Zarate presented on anemia, iron deficiency and depressive symptoms in adolescents, whilst Maryam Razaghi presented on vitamin D supplementation in neonates. Masresha Tessema presented on the role of protein, zinc and mycotoxin intake in linear growth failure whilst Anne-Julie Tessier presented the different criteria to identify individuals with sarcopenia in the Canadian population.

The morning was finished off with 3-minute pitches by seven McGill PhD students. They pitched patterns of bone mineral accretion in healthy breastfeed term infants (Nathalie Gharibeh), the impact of new technologies on patients with type 1 diabetes (Meryem Talbo), palm weevil larvac fortification as additional food product for improvement of iron status (Loloah Chamoun), the effect of intranasal insulin in prevention of anesthesia-induced cognitive impairment (Patricia Roque), bile acid malabsorption and resistance to weight loss (Salam Habib), a systematic review on online training platforms for patients with chronic diseases (Li Feng Xie) and the effect of arachidonic acid on diet-induced obesity and bone mineral content (Ivy Mak).

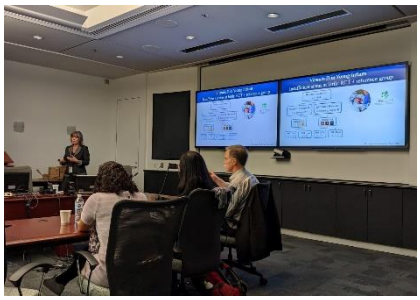
Hereafter, we were provided with a healthy, very palatable lunch and then we got a tour around the campus in two groups. We were shown The Mary Emily Clinical Nutrition Research Unit, a few of their labs with their own shime as highlight. The tour ended in a building with offices for psychological researchers.

We finished the day with drinks and a networking event. Unknown to us, there was a silent competition ongoing during the presentations. The prize of best pitcher went to Anouk and Iris won the prize for best oral presentation. After a great day during which we felt very welcome and heard a lot of interesting research results, we got on the bus and headed to Ottawa.

October 25: Health Canada & uOttawa

We were welcomed by Kevin Cockell, the chief of Nutrition Research Division at Health Canada. Health Canada, together with Public health agency of Canada, Canadian Food Inspection Agency, Canadian Institutes of Health Research, is a government agency under the Ministry of Health. During his talk entitled 'Nutrition Research at Health Canada: Who, What, Why?', Kevin highlighted two national surveys currently being conducted: Canadian Health Measures Survey (CHMS) and Canadian Community Health Survey (CCHS). CHMS has been conducted biannually since 2007, and is currently in cycle 6. It is conducted in 16 sites across Canada and includes a nationally representative sample. Meanwhile, CCHS has both an annual and focus component (every 3 years) to collect food intake data. Another thing that was highlighted during the talk was Canadian Nutrient File, which is a reference for food composition of nutrients and currently has over 5800 foods for 150+ food components.

After the talk from Kevin, Laura Heusschen (HNH WUR) described the types of bariatric surgery, its benefits, and risk of malnutrition as one of the complications that may arise after surgery. These brings her to do a PhD project on nutritional status after bariatric surgery, in which one of the studies she will do is related to pregnancy after the bariatric surgery. The next talk from Health Canada is from Sylvie St. Pierre about how the evidence is used to inform dietary guideline. She especially highlighted the new version of Food Guidelines that was just published in January 2019. One of the new aspects from the new Food Guidelines is that it includes actionable advice for Canadians, for example cooking more often and being mindful of eating habits. Food Guidelines for Canadians are also improved to more relevant for the indigenous populations.



Inge Groenendijk (HNH WUR) presented her results on meta-analysis on protein and bone health. She showed that higher protein intake was related to 11% lower hip fraction. This shows that protein is not only important for muscle but also bone health. After that, Hope Weiler (research scientist at Nutrition Research Division of Health Canada) brought us a closer look on measurement of vitamin D status in the Canadians. She also mentioned that the current survey does not have information on indigenous people, children below 3 years and pregnant/lactating women. Using the Pan Canadian Pregnancy Cohort, she showed that percentage of pregnant women that reached less than target changed depend on which time of measurement. Furthermore, she showed that

breastfed babies should be supplemented by 400 IU vitamin D/day to ensure sufficient vitamin D status.

Masresha Tessema (HNH WUR) described his PhD projects in Ethiopia. He showed that the children had a predominantly cereal based diet and low diet diversity, almost half of the children had intestinal parasite and 35% had inflammation. In his third study, he presented data on mycotoxins (aflatoxin and fumonisin) exposure in the children. However, exposure to these mycotoxins was not significantly associated with protein biomarker or linear growth of children. Learning from his projects, he suggested that agricultural intervention should also take into account the infections in the area.

The presentations continued with Stephen Brooks from Health Canada presented a critical look on dietary fiber research, for example, how the definition of dietary fiber changes over the years. Tsitsi Chimhashu's PhD project is related to bioequivalence of provitamin A. She started with explaining the many factors affecting bioequivalence of provitamin A and highlighting that genetic factor may potentially influence variability in conversion of provitamin A in Africans. This in turn may affect the recommended intake for Africans. In one of her planned studies, she will use the isotope trace dilution techniques to study bioconversion and bioequivalence of provitamin A. The last presentation by Rana Wahba was about application of health literacy lens to nutrition labeling approach and consumer research process. She explained the use of Newest Vital Sign, one of the tools to assess health literacy. She showed the importance to involve health literacy as a moderating variable in assessing impact of foods to health.

After lunch, we finished the visit on Health Canada and moved to University of Ottawa where we were welcomed by Chibuike Udenigwe. The research in Nutrition Sciences in University Ottawa is mainly related to gut and mental health, for example on biopeptides, related to food matrix and processing effects. Moniek van Zutphen (HNH WUR) presented her research which was started 8 years ago about lifestyle after colorectal cancer diagnosis. She started her project as she was concerned that there is no evidence-based recommendation for patients with cancer diagnosis. In her study,

she found that moderate adherence to the guideline by World Cancer Research Fund was related to better survival.

The next presentation was by Xiaohong Sun who presented her research on anti-adhesive therapy as an alternative approach to antibiotic regimen. She showed that cranberry proanthocyanidins inhibited adherence of Escherichia coli to urinary tract. Next, Carlijn Lamers (HNH WUR) presented her research on inflammatory bowel disease. She showed that there was an association between disease activity and inflammatory potential of diet and level of physical activity in patients with Crohn's disease. Research by Walid Mottawae from University of Ottawa aims to understand the role of gut microbiome in mental health. He noted that existence of some strains of microbiota are related to decreased anxiety. These microbiota strains can produce GABA and he used *in vitro* continuous fermentation model to study the relations. He noted that fatty acid metabolism was enriched after treatment by GABA producing bacteria (Bifidobacteria dentium) but diversity of microbiome was not affected. The next presentation was by Esthika Dewiasty (HNH WUR) who studied prevalence of lactose intolerance in Indonesian older adults.

Edith Feskens (HNH WUR) explained in her lecture about the researches done in her chair Global Nutrition. The mission of this chair is to study how to obtain health for 9 billion people with sustainable diets. She presented the highlights from INSTAPA/CASSAVITA study, and Bazin study, and also upcoming studies, for example by Tsitsi Chimhashu. The next presentation was from Arli Zarate Ortiz who is a part of a larger study Ten2Twenty, aiming to study adolescents in various countries. She studies the relation of anemia, iron deficiency and mental health in adolescents in low socio-economic neighborhood in Mexico. She showed that one out of four of the adolescents she studied had signs of depression and anemic adolescents were 79% more likely to have depressive symptoms.

Ruth Boachie from University of Ottawa presented her results on effect of processing (hydrothermodynamic) on blueberries effectiveness in controlling postprandial glucose and antioxidant status in adults. Hydrothermodynamic-processed blueberries were hypothesized to have less oxidation of the beneficial component because of the continuous manner of the processing. Afterwards, Tsitsi Chimhashu (HNH WUR) presented her study on bioequivalence of provitamin A from a mixed diet. The last presentation was from Jean-Francois Mallet who studies microRNA modulation by food derived products and their impact on cancer. He focuses on Serratia vaccinia which is a natural microflora in lowbush blueberry. Existence of this microflora raise natural polyphenols present in the juice by 4-fold. He further showed that juice from this blueberry prevent metastasis of tumor to lung. After the presentation from Jean-Francois, we were guided to visit the lab facility. In general, this is an intensive but interesting and inspiring day.

October 26-28: Weekend!

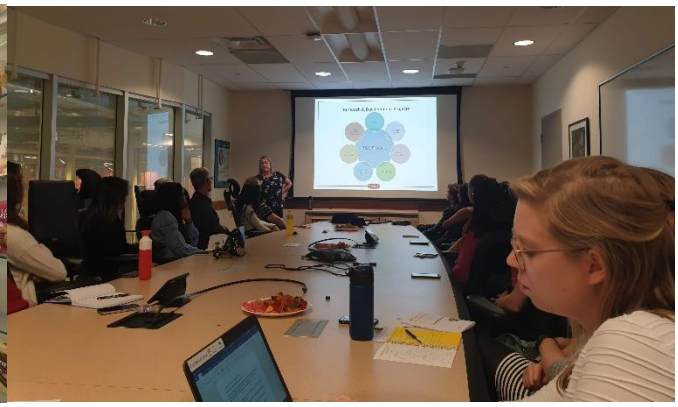
October 29: Dare Foods

On Tuesday 29th of October we visited the Dare foods factory, which is a manufactory of cookies, crackers, fine bread, candy. Their facilities are peanut and nut free. We had a healthy start; namely some coffee and fresh fruits together with introductions by the whole sensory R&D team. After that we had a tour around the facilities. The facilities are fairly new, since they moved in October 2018. We were shown the innovation center and sensory facilities where they test the shelf life of the products. Moreover, we were shown pictures of the production process in the factory.

After this, we had some very interesting presentations. First, the employees of Dare started, which gave us some interesting insights into the daily working life at Dare. Zee is head of the sensory program, in which they test ingredients or products on different sensory aspects, such as saltiness, moisture, crispness, hardness or flavor intensity. A focus is on shelf-life and preference of people on product choice. Dare foods has a descriptive trained panel, consisting of 10 trained people who can do an extensive screening test, based on a 15 point unstructured scale (on aroma, flavor, texture). Moreover, they do discrimination testing using a triangle test, where people get three samples of which two are the same and one is different. This is mainly used to test ingredient changes within a product. To identify "product gaps", Dare uses projective mapping. For this method they buy all foods already available, taste it and define in which setting the product can be eaten (such as, for children, to give to school, at home during movies etc.), and then they define where the gap is and try to develop a new product.

After this interesting presentation of Zee, Christine of the R&D department took over. She explained all the activities of the R&D, namely: innovation, alternate suppliers, product renovation, productivity, operations support, quality improvements, new equipment qualifications. She explained how the innovation of products works.

After this, it was time for the Wageningen University researchers to present. First, Marco Mensink gave a short introduction of our department. After that, it was time for five pitches of our PhD's, namely Elbrich, Paulina, Rouxuan, Rachelle and Amy. This led to some nice in depth discussions. The morning flew by, and then it was time to have some very good Mexican lunch provided by Dare, and time to taste some of their cookies. During lunch, Marco gave a short lecture on carbohydrates during physical activity (mainly focused at marathon runners). We had an inspiring day and it was very interesting to visit a company and see the difference with university research!



October 30: Waterloo University / RIA

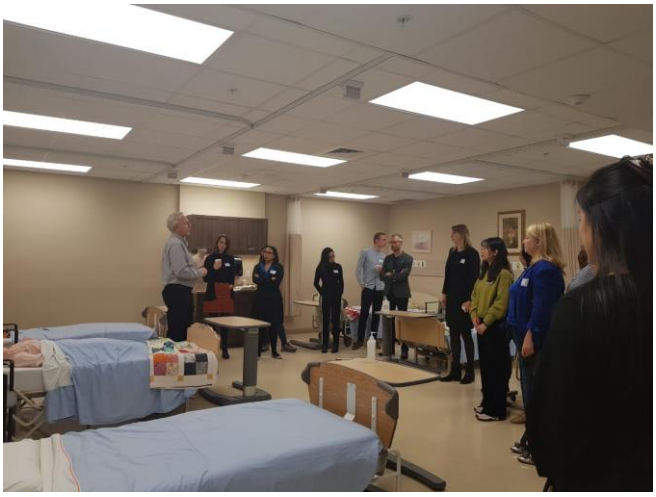
We visited The Schlegel-University of Waterloo, Research Institute for Aging (RIA). Heather Keller (the Chair in Nutrition and Aging, University of Waterloo) and her team gave us a warm welcome, while Renate Winkel gave them an introduction about PhD Tour program of Wageningen University.

Heather Keller gave a presentation about Overview of Aging Health & Wellbeing program at RIA. She explained the organizational structural, list of research activities, members of research unit and existing collaborations. The RIA is a charitable foundation dedicated to enhancing care and quality of life for older adults. They drive innovation to tackle the biggest issues facing an aging population. The RIA supports research and explores aging across various topics. To date, they have 10 chairs, 5 specialists, and 21 scientists.

Regarding the research, initiated in 2008, The RIA's partnership with the University of Waterloo and University of Guelph focus on food, nutrition and aging research. In addition to supporting research and mobilization activities across a variety of topics, the RIA has four core programs:

- Agri-Food for Healthy Aging
- GeriMedRisk (geriatric telemedicine program)
- Murray Alzheimer Research and Education Program
- Centres for Learning, Research , and Innovation in Long-Term Care

Josie D'Avernas (Executive Director of RIA Team) explained about RIA/SV partnership, as well as their individual & collaborative programs of research. These programs are also applied in some research Labs, as well as nutritional care in hospitals, communities, and residential settings.



After having overview of the RIA's program, we had a visit to some sites: a tour to RIA and Learning Classroom, as well as a tour to the University Gates Schlegel Village. The Duizer research lab learns the fundamental of oral processing: studying the dynamics of texture perception, the role of saliva in breakdown during eating, physiological flow of liquids for individuals with dysphagia. This research lab also has objective to improve the life of older adults through food, by providing better sensory/nutritional/ properties & eating experiences. We also visited the Laboratory of Nutritional Lipidomics. This lab practice in the development of advanced fatty acid & lipid analytical methodologies the effect of sex & pregnancy on PUFA metabolism dietary forensics. We also had a visit to University Gates Schlegel Villages and having observations on older patients there. However, in the Schlegel Village we were not allowed to take pictures/video due to confidentiality of the patients.

During the visit, we also have a serial of research presentations. The presentations were:

1. Marion Buso (WUR): Presentation on Sugar, sweeteners and weight regulation: a life-course approach. Consumption of added sugar, and sweeteners related body weight again and birth weight, and the different biological fates. Finally future research areas indicated.

2. Charlotte Kramer (WUR) : Presentation on a multimodal intervention in older adults. Indicated the contribution of individual nutrient and E-NRF index. Further intake data were validated using biomarker.

3. Olivia Romaniw (RIA-Waterloo-Guelph University):Presentation on the newly developed nutrient-rich food score for older adult. Nutrition in Disguise: Effects of food neophobia, health interests and health information on liking and sensory perceptions of nutrient-dense foods for older adults.

4. Vanessa Trinca (RIA-University of Waterloo) Presentation on Putting Quality Food on the Tray': Understanding the Patient Food Experience in Ontario Hospitals.

5. Pol Grootswagers' presentation & discussion (WUR): Presentation on Copula Graphical Models in Nutrition and Aging. He showed the finding from copula graphical model, as well as its applications. The future direction is to apply more method in nutrition field (i.e. NutriNetwork R Package). It is also recommended to explore veg pro and B-vitamins in relation to physical functioning.

6. Berber Dorhout's presentation & discussion (WUR): Presentation on effectiveness of a diet and resistance exercise intervention on muscle health in older adults: ProMuscle in Practice. She also presented the finding intervention study on how sarcopenia reduced.

7. Tianchunlu Yu's (RIA-University of Waterloo): Presentation on the use lipidomics to analyze fat Intake and also how to understand fat in the food supply.

8. Jill-Morrison-Koechl (RIA- University of Waterloo): Presentation on exploring end-of-life nutrition care practices and contributing factors in long-term care. Further, she indicated major challenges in nutrition care and practices.

9. Cindy Wei (RIA- University of Waterloo): Presentation on Nutrition in Disguise. She presented about the cost and nutrient analysis when promoting nutrient density in long term care menus.

10. Rachell Donnelly (RIA-University of Waterloo): Does colour make a difference? Blue plates for dinner in dementia care

11. Katarina Doma (RIA-University of Waterloo): Beans for healthy aging

12. Iris Rijnaarts' presentation and discussion (WUR): Presentation on dietary triggers in Irritable Bowel Syndrome are not related to subtypes or severity.

13. Xiaolin Li's presentation and discussion (WUR): Presentation of the future study on gut-brain axis during cachexia, with emphasis on nutritional and nutraceutical-derived compounds

14. Vera Wesselink's presentation and discussion (WUR): Presentation on inflammatory potential of the diet in relation to colorectal cancer recurrence and survival.

The visit ended up in the afternoon by wrap up closing speech from Heather Keller and Allison Duncan on behalf of The Schlegel-University of Waterloo, Research Institute for Aging (RIA).

October 31: McMaster University

Today is a special day: Halloween! We visited the Exercise Metabolism Research Group at the Department of Kinesiology of McMaster University in Hamilton, led by professor Stuart Phillips. The three main research areas that the Department of Kinesiology focuses on are Integrative Physiology, Mechanics & Control of Movement, and Neuroscience & Behaviour, and the Phillips Lab mainly studies the effects of nutrition and exercise on body composition, muscle function, the mechanisms of human skeletal muscle protein turnover. Professor Philips told us 18 students from Wageningen University & Research have performed thesis or internship work within his group since he started working at McMaster 20 years ago. The group is very open to collaborations and invites (future) PhD candidates from WUR to partially perform their PhD work within their group.

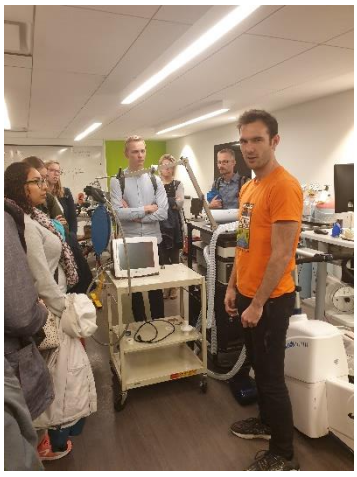
Since the Phillips' Lab focuses on nutrition, exercise and muscle health, the topics of today's presentations were all in this area of research. McMaster PhD candidates Sydney Valentino and Emily Dunford presented results of their pilot study with two types of exercise in cardiac rehabilitation patients, which showed that high intensity interval training in the form of a stair climbing exercise was equally successful in increasing cardiorespiratory fitness compared to traditional moderate-intensity continuous training. Furthermore, Mai Wageh shared the outcomes of her RCT with resistance exercise and two nutritional supplements in healthy young adults, which indicated a superior effect of a new supplement including whey protein and various nutrients on muscle mass gain with resistance exercise training compared to a protein supplement based on collagen protein. Lastly, Postdoc fellow Dan Traylor told us about the growing market for protein supplements and a leucine-enriched protein product he is currently developing and testing. From WUR, Berber Dorhout presented the preliminary results of the ProMuscle in Practice project and the plans for her future projects; Pol Grootswagers shared the results of this trial with a new oral nutritional supplement in malnourished older adults; and Inge Groenendijk presented outcomes of her meta-analysis on protein intake and bone health in older adults, as well as plans for her future trial on protein supplementation in hip fracture rehabilitation.

Our visit concluded with a tour of the McMaster Physical Activity Centre of Excellence (PACE), which houses exercise facilities for sports, rehabilitation and research. The PACE includes state-of-the-art sports facilities specifically tailored for individuals with spinal cord injuries. The tour also included their wet lab, in which the group performs mainly western blots and immunohistochemical stainings, the research kitchen and their very large DXA scanner. A few of the Lab's PhD candidates also talked about their research in areas like ketone body supplementation and showed us equipment to measure VO_2 max.

All in all, it was a very interesting morning with excellent presentations and it was nice to meet Stuart Phillips and his lab, who are very enthusiastic about collaborating. We even got to try delicious traditional Halloween treats.

Clips of 10-second pitches from our presenters were posted on the McMaster Science Instagram

Prof. Phillips gave us a tour of the McMaster Physical Activity Centre of Excellence (PACE) exercise facilities for sports, rehabilitation and research



PhD candidate showing equipment to measure VO_2 max

November 1: University of Guelph

We were warmly welcomed by David M. Mutch, who is associate professor at the department of Human Health & Nutritional Sciences. He informed us about the University of Guelph, whose motto is to improve life. After David's talk, Renate Winkels introduced the research that is performed at WUR's department of Human Nutrition & Health. There were a lot of similarities between the research that is performed at the Nutrition department in Guelph, and what we are doing in Wageningen. The remaining of the morning session was filled with presentations from both Guelph and WUR, which can be described as an interactive exchange of knowledge and ideas.

Hana Dibe started the seminar. She concluded that exercise training alters the response to catecholamines and reduces the liver's response to epinephrine, comparing active and sedentary mice. Then Miranda van den Ende presented her work on the changes in muscle micro-environment and energy homeostasis underlying cancer-induced cachexia. The third presentation was by Xinran Zuan, who studied alternative splicing of Pcyt2 on the novo synthesis of phospholipids in mouse myoblasts. Alexander Rajna's presented on the regulation of lipid metabolism by n-3 pufa being dependent on metabolic status. After that, Kamalita Pertiwi presented her work using the Alpha Omega cohort, concluding that an increasing circulating linoleic acid is related to lower diabetes type 2 risk. The final presentation of the morning session was by Jordan Lee, who showed that docosahexaenoic acid reduces resting blood pressure compared with eicosapentaenoic acid in healthy men and women.

After lunch, Professor Marco Mensink gave a plenary lecture on Skeletal muscle, protein and endurance exercise adaptation. The central theme was the nutritional impact on molecular and physiological adaptations, including CHO availability and acute response after resistance exercise and protein supplementation and endurance training adaptation. Then we had a tour of the Bio Diversity Institute guided by Prof. Sarah Adamowicz. She introduced their research, especially the environmental monitoring project. We visited the laboratory and saw many different insect specimens.

After this, Prof. Philip Millar gave a lecture about Exercise Genomics and Cardiovascular Physiology, with emphasis on influence of our genes on the blood pressure response to exercise. He showed that high resting blood pressure could increase the risk of cardiovascular disease. After this lecture, Tessa de Bie presented her research: Health effects of GABA from potato and tomato via regulation of carbohydrate metabolism and blood pressure. Then Animesh Vadaparti gave a presentation about Novel Associations between Taste Receptor Variants and Clinical Risk Factors in Assessing Chronic Disease Risk for Adults. Anouk Gijbels gave the last presentation for today. Her topic was The PERSON-study: PERSonalized glucose Optimization through Nutritional intervention.

Finally, to close the day, we all went to the campus pub for a very successful networking event along with some drinks and bites.