# Faculty of Agricultural and Environmental Sciences – Internship Program - Summer 2020

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<td>Wang, Josephine</td>
<td>Näak Bar</td>
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<td>Ward, Anne-Michelle</td>
<td>Hopital Veterinaire Victoria</td>
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The Herbarium
The McGill University Herbarium is one of the oldest natural history collections of dried plant specimens in Canada, housing over 140,000 plant specimens. This collection catalogues mostly local flora, offering researchers a look into both the past and present of local plant biodiversity.

My Role
This summer I worked as an Assistant Content Creator for the McGill University Herbarium under the supervision of the collection’s curator, Dr. Frieda Beauregard. Due to the pandemic, my internship was remote, so I worked from home rather than on campus. In the first half of the internship, I was tasked with creating a series of botanical illustration workshops that would be open to McGill students, faculty, and staff. In the end, a total of 4 workshops were made, 3 of which were designed to be offered in person, and 1 was recorded to be offered virtually. This included designing lesson plans and learning objectives, as well as creating handouts, slides, and exercises to accompany and facilitate the running of these workshops. In the second half of this internship, I worked jointly with my supervisor and another intern to create an educational children’s colouring book about plants, called “Busy Plants”.

Projects
- Natural Dyes Workshop “Natural Dyes: Harnessing the Natural World”
- Botanical Illustration Workshop 1 “Botanical Illustration: Drawing the Natural World”
- Botanical Illustration Workshop 2 “Botanical Illustration: Painting the Natural World”
- Digital Botanical Illustration Workshop
- “Busy Plants” 36-page educational colouring book

What I Learned
By creating the workshop series, I learned how to design lectures and lesson plans, how to convey information in an accessible way, and how to better communicate and engage with an audience, skills that are invaluable to anyone working within an academic setting. With each project, I also got to learn about a wide range of topics, like the chemistry involved in the dyeing process and plant pigments, or the role of visual communication within plant science. While illustrating the children’s book, I also got to learn a lot about different plant species and their specific morphologies.

I also had the chance to participate virtually in the Society for the Preservation of Natural History Collections conference, where I was able to learn more about natural history museums and what goes into preserving and studying a collection, preparing exhibitions and communicating science to the public. Speaking with the herbarium’s curator also gave me a better understanding of what goes into taking care of McGill’s collection in particular and what working within an academic institution is like.

Skills
- Video & Sound Editing
- Time Management & Organization
- Instruction & Communication
- Content Creation

Contact Information
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Life Sciences U2
Summer 2020

Curator: Dr. Frieda Beauregard;
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St Anne de Bellevue, QC H9X 3V9
Predicting *Schistosoma mansoni* Extracellular Vesicle Micro RNA (miRNA) Target Genes with Bioinformatic Software

My project centered around applying bioinformatic software to predict targets of miRNA and testing these results in the lab; I investigated isolated miRNA found in EVs released from *S. mansoni* by using the sequence in order to predict possible target genes.

This research required background in cellular communication, RNA functionality, and computer bioinformatics; in addition to a literature review to better comprehend these topics, I was able to spend time in the lab, learning standard laboratory protocols and research methods. I had the opportunity not only to learn these subjects but apply them in my project to observe some real-world applications.

Project by Trevor Bell: trevor.bell@mail.mcgill.ca
Supervised by Dr. Thavy Long: thavy.long@mcgill.ca
Mining Reclamation Internship

Data collection of seedlings for revegetation project
Credit: Avril Jobin – Department coordinator

Bear on the tailings storage pond
Credit: Lianne Bellerose

Scientific projects include:
• Biology/chemistry: Small-scale projects for mining reclamation process (covering of acid-generating material and revegetation of the site).
• Biology/chemistry: Water sampling to ensure that the water meets the governmental requirements.
• Ecology: Presence of wildlife on the site.

My Experience as an Intern

What did you do?
• Water sampling
• Seedling inventory
• Data compilation
• Biodiversity picture collection

Where did you work?
• Agnico Eagle Mines – Laronde Complex
• Rouyn-Noranda, Québec (hometown)
• Deepest gold mine of the Americas (3.4 km)

Why was it important/significant?
Big industry in this region, great job opportunities

What I Learned

What did you learn about yourself?
• More passionate about wildlife than mines
• Independent at work

What did you learn about the industry?
• Correcting environmental mistakes from the past
• Mining reclamation

What skills did you develop?
Seedling inventory

Having done this internship, what will you do/ not do next?
Next internship: greater focus on biodiversity/wildlife

Lianne Bellerose; lianne.Bellerose@mail.mcgill.ca
Environmental Biology
Summer 2020
**Abstract**

Food waste in Quebec’s CHSLDs was estimated using on-site observations and interviews, and compared to hospital food-waste literature in order to estimate the amount of food being wasted given the amount of residents. The estimates of food waste were converted to dollar values, CO₂ equivalent emissions, and environmental and social impacts using Canada’s Carbon Tax system.

**Observations**

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<th>Category</th>
<th>Description</th>
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<tr>
<td><strong>Social</strong></td>
<td>Resident conditions (dysphagia) combined with staffing ratios, portion sizes and menu.</td>
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<tr>
<td><strong>Economic</strong></td>
<td>Current meals cost $2.34, with an estimated 30% being wasted. All 48M meals served annually, total economic losses amount to $33.7M; assuming transportation, preparation, and energy costs are internalized.</td>
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<tr>
<td><strong>Environental</strong></td>
<td>Western diets produce 4.3 grams of CO₂/calorie, totalling 37,164 tonnes CO₂ emissions wasted; The equivalent to 150,000 diesel cars in driving in Quebec annually. The environmental costs, estimated at $100/tonne CO₂, are $3.7 million, and associated social costs of $1.5 million annually.</td>
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**Solutions**

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<th>Action</th>
<th>Description</th>
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<tr>
<td><strong>Reduce</strong></td>
<td>Social changes are required in the food-waste chain. Adapting portion sizes to the resident needs and preferences. Policy changes required for the current system to adapt using a top-down approach to food distribution management.</td>
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<tr>
<td><strong>Reuse</strong></td>
<td>Redistribution to food-insecure persons is not a viable solution for cooked meals, therefore, using the food as animal feed, specifically pig-feed, could produce 1.4M kg of edible pork/year.</td>
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<tr>
<td><strong>Recycle</strong></td>
<td>Composting and biomethanation infrastructure is well established in Quebec. Compost used as soil amendment but carries the environmental impacts, whereas, biomethanization can convert the 14,000 tonnes food-waste into $730,000 of natural-gas generated energy annually.</td>
</tr>
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**Considerations**

The food-waste chain involves many links including the farmers, transportation, processing, packaging, distribution, preparation, administration, consumers, and waste collectors. The common thread in coordination efforts is policy change from governments in order to affect how society views food-waste.

**Conclusion**

None of the solutions are ideal on their own due to the numerous factors mentioned but if used in combination the overall costs to the CHSLDs and ultimately to the tax-payers may be reduced. The costs of food for the CHSLDs may be reduced by changing social behaviors of the staff and residents in regards to their eating habits, the unspoiled portions may be reused or donated otherwise used as animal feed for swine production, and finally spoiled foods can be used to offset the costs of cooking and heating.

**References and Acknowledgements**

Food waste images source: 
- The food-waste hierarchy image: Source.
- CompostDataTracker (accessed 3/1/19).
- Compost & Decomposition: Environmentally Friendly Facilities. 
- McGill University.

**Introduction**

During a five week period of supporting the staff in the CHSLDs it was observed that upwards of 30% of the resident meals were going untouched and it was determined by performing informal interviews with the staff that there were no organic-waste management practices in place. With over 43,850 residents in Quebec, serving 131,550 meals daily, or 48,015,750 meals annually, it becomes clear that there is a momentous amount of unaccounted food-waste being produced.
Benchmarking analysis of the biodigesters exploited by Veolia Water in France

My experience as an intern
This summer, I had the chance to work for Veolia Water France. My work consisted of gathering and analysing data from the municipal biodigesters exploited by the company in order to evaluate their performances. While I worked mostly in Veolia HQs, I also had the chance to visit some sites across the country. The results obtained from this study helped the company to build a strong database to use in future research, but also show flaws in exiting data collecting systems.

What is a biodigester?
A biodigester is a closed infrastructure that helps reduce the organic load of sludge from waste water treatment plants (WWTPs) through anaerobic digestion. Biodigesters also have an additional value for the company as they produce biogas, which can then be valorised.

What did I learn?
This internship helped me to better understand one of the field of study for an engineer in the industry. I had the chance to be supervised by different experts who gave me insights of their role in the company. Working with different experts allowed me to better understand the inner workings of a multinational company like Veolia. I also had the chance to develop different skills throughout my mission. I had to adapt quickly to a new working environment. I had to be critical about my work and the outcome of the study. Communication with my supervisors was also essential as I had to report my findings regularly in the form of written reports and presentations. Finally, I had to go through a thorough research on the subject before analysing my findings. All in all, this internship was great opportunity for me to grow as a person, but also as a future professional.
Environment Intern at Parsons Corporation

My Experience as an Intern

- Interned at Parsons Corporation in Alberta
- Worked with engineers, geologists and scientist on remediation and occasional reclamation projects
- Conducted site assessments and created detailed site plans with GIS and CAD software
- Developed and maintained proprietary analytical software

What I Learned

- Learned about both the technical and project management skills needed for different projects
- Learned about how emerging technologies like geospatial imaging and drones will shape the future of the industry
- Further Developed software development skills and the usage of GIS and CAD applications for different projects

Science

- The majority of my work was related to environmental engineering and also programming for technical work
- Work involved engineering principles, environmental science and software

Ervin Cai; Ervin.Cai@mail.mcgill.ca
Bioresource Engineering
Summer 2020
Organic Farming at Terra Millefolia

My Experience Working on a Farm

I worked as an intern on a small organic farm in Ile-Bizard. My daily tasks involved planting seeds, transplanting seedlings, weeding and harvesting. Although these tasks sound relatively straightforward, each type of crop has different growth & harvest requirements. Given that our farm had approximately 150 different varieties of crops, it was quite the learning experience!

My Research

My research compared the effectiveness of two commonly used organic fertilizers: alfalfa pellets and hen manure pellets. The experiment was carried out over an 8-week period, and soil tests were performed every two weeks to measure N, P, K and pH. Results indicated that the alfalfa treated plot had a 6% higher crop yield than the hen manure treated plot. However, due to environmental factors the results were deemed inconclusive.

What I Learned this Summer

The main learning experience I have taken away from this summer is that farms can work harmoniously with nature. I had never realized how animals and insects could actively help farms succeed when they are not eliminated through the use of pesticides. Bees, toads, snakes and birds all assisted in the success of our farm this summer and it was amazing to witness in person.

Andrea Calabrese
Bioresource Engineering
Summer 2020
5S System at CDL Maple Sugaring Equipment

My Experience as an Intern

This summer, I worked at CDL Maple Sugaring Equipment. It is located in a small village called Sainte-Claire, Qc. I worked on the 5S system which stands for sort, set in order, shine, standardize and sustain.

I worked at different workplaces in the manufacturing shop. These workplaces all have different roles such as the manufacturing of extractors, turbines, pumps, concentrators, etc.

This job is important for the company because we find solutions to problems at a particular workplace and we improve how the employees are working. We reduced to its minimum the manual labor employees were doing to reduce the possibilities of injuries at work.

We also changed the workplaces’ disposition to be time-efficient when moving between work stands. We wanted them to be more productive and we wanted them to loose less work time. These changes will clearly have a positive impact in the future of the company.

What I Learned

This summer, I learned that I have a good capacity for adaptation. I adapted myself rapidly to my new environment, new colleagues, and new schedules. I also learned that I had already good communication skills. However, these can always be improved.

I learned a lot of things I did not know about this industry regarding the manufacturing of maple syrup equipment. I also learned that there are a lot of improvements that could be done in the future regarding the choice of materials.

I developed skills related to the implantation of the 5S system. I learned what are the important things we must do and ask in order for the workplace to be considered long-term and not short-term. I also developed skills related to time management and organization.

After having done this internship, I will definitely keep myself updated on what is going in the maple syrup industry. I will read about the development of new technologies and try to figure out where the industry is going in the future.

Science

The science behind this internship is to improve system performance. The system we are implementing in a particular workplace has as an objective for the employee to be more efficient and productive. There is also a psychological science behind this system since we need to approach the employee in a positive way and bringing them to understand the reason behind our decisions. My area of work for this internship was where the system had to be implemented. Most of my time, I was working in the shop with the employees, observing them, and asking them questions regarding their daily job.

Marika Chabot; marika.chabot@mail.mcgill.ca
Bioresource Engineering
Summer 2020

CDL Maple Sugaring Equipeemen
Website: www.cdlin.ca
QA/QC internship @ Les aliments Rustica

My Experience as an Intern

I did my internship in an Italian food products company named Les aliments Rustica.

I worked as a QA/QC technician.

This experience is important because as a food science student it is crucial for us to gain hands-on experience in this field and to apply our knowledge. And through my internship, I’ve learned practical skills with clearer understanding of the importance and tasks need to done by QC in food industries.

What I Learned

I learned about myself is that I am a person who pays attention to details and be able to work in fast-paced environment. My communication skills are improved through this internship.

Working in the food industry always requires one to adapt harsh working condition, it can also be very physically demanding but need to be careful and a sense of both teamwork and individual work.

Having this experience, next time I will try to find an internship in another department such as R&D or more laboratory-based role. I think this type type of job will challenge me more.

Science

As I am not doing a research-based internship, I could only share some of my duties relate to Food Science major. Daily QC/QA activities include swabbing to test EB and Lspp for environment. And gas (O2/CO2) and leakage test for non-frozen pizza crust product.
Summer 2020 Internship at National Health Research Institutes
Humanization of Mouse Monoclonal Antibodies Targeting CLEC11A Expression

My Internship
This summer I worked an intern alongside other Research Assistants in P.I. Yi-Rong Chen’s Molecular and Genomic Medicine research lab at National Health Research Institutes in Taiwan. One of P.I. Chen’s research focusing on treating lung adenocarcinoma. In his previous study, he discovered that-lung adenocarcinoma characterized with mutated EGFR will highly express CLEC11A. Expression of CLEC11A promotes lung cancer growth in xenotransplantation models. Neutralization antibodies to CLEC11A blocks tumor growth. As an intern, I was assigned to humanize two mouse monoclonal antibodies against CLEC11A.

My Experience
Working in the lab was an exciting, yet, challenging experience. Applying the experiment technics in real-life context is very different in comparison to what we learned at school. There are many important details and adjustments that textbooks will not teach you. You will only learn through practical experience and mistakes. This internship experience was intellectually fulfilling and enlightened my interest in career of research.

The important lesson I have acquired out of the internship experience was that, in research, you must be patient and stubborn. Oftentimes, I made regretful action and resulted in awful data. There are also many instant, I obtained no result despite I followed exactly what protocols illustrated. It was depressing and exhausting to redo the experiment. Nonetheless, you must be determined and persist the tedious experiment. Mistakes also make you grow. When you do obtain a result that can push your project forward, you will acquire the best feeling in the world!

What I have Learned
Throughout the internship, I have learned:
- To construct plasmid including designing PCR primer by utilizing online resources.
- To follow and complete many experiment protocols that are essential to laboratory research, such as polymerase chain reaction (PCR), restriction digestion, ligation, DNA electrophoresis, gel extraction, gel purification, transformation, bacteria culturing and selection, plasmid extraction, transfection (lipofectamine 2000), maintaining cell line, cell subculturing, cells counting, Western blotting and singling clones by limiting dilution and expansion.
- To work in a biosafety cabinet.
- To prepare for monthly paper discussion and experiment progress presentation.
- Many antibodies concepts and theory behind the experiments.
Northern Growing at Klondike Valley Nursery

**Activities**

- Lived and worked on a plant nursery in Yukon, Canada.
- Greenhouse production, food, berry, and apple crop cultivation and research
- Nursery provides locals with plants for growing food specifically suited to a northern rural region

**Science**

- Data gathered on twenty apple cultivars covering phenology, productivity, and cultivation practices
- Regular assessments of apple trees and environmental data collection
- Nursery will report on these characteristics for the studied cultivars in a manner consistent with the Canadian fruit industry
- A northern growing guide for locals will also be released so that apple tree growing in the north can be more accessible

**What I Learned**

- I learned that I enjoy the observation needed to write plant descriptions and love the challenge of growing in a subarctic climate
- There is a lot of research in northern agriculture taking place in Canada right now
- The research is interconnected and KVN works very closely with universities to test cold-hardy varieties for market use
- I developed skills specific to berry and apple orchard cultivation on a small commercial scale
- In the future, I would like to learn about northern agriculture more closely tied to food security. Potentially livestock, and/or grain and root crops

Sabrina Clarke; Sabrina.Clarke@mail.mcgill.ca
Bioresource Engineering
Summer 2020

Employer: Klondike Valley Nursery
Kim Melton; klondikevalley@gmail.com
Dawson City, Yukon, Canada
Rescue, Rehabilitation, and Release: Working @ Hope for Wildlife

My Experience as an Intern

This summer I worked at Hope for Wildlife, a wildlife rehabilitation center in Seaforth, Nova Scotia. Their mission is to rescue, rehabilitate, and release injured and orphaned native wildlife. You can learn more about them at www.hopeforwildlife.net!

Being my second summer, I was tasked to oversee the Orphaned Raccoon Nursery, feeding, cleaning, providing stimulating enrichment, and basic medical care to over 200 raccoon kits.

I was also lucky enough to work in the overnight drop-off center, triaging and providing basic medical care to incoming patients until the veterinary staff arrived in the morning. I was able to observe and help with some procedures and cases of the wildlife veterinary clinic as well.

What I Learned

I discovered that I really enjoy a fast-paced, hands-on environment, and that working with animals is a must for my future career.

I learned that wildlife rehabilitation is an ever-growing field, with new research being published and changing how procedures and cases are handled all the time. There are also many opportunities for continuing education in wildlife conservation and medicine besides just veterinary medicine programs.

I was able to grow my current wildlife rehabilitation skills and learn how to perform basic procedures such as injections, fluid therapies, fecal floats and calculating medication dosages. From my co-workers I gained knowledge on common infectious diseases, such as viruses, parasites, and bacterial infections.

Having completed this internship, I plan to use the experience to apply to a Doctor of Veterinary Medicine program or a masters degree in wildlife conservation.

Science

This summer for my final research project I chose to investigate carnivore protoparvovirus 1, a very contagious species of virus that can cause widespread losses in our juvenile raccoons. I examined the pathology and etiology of the virus, available diagnostic tools, known treatment options, and prevention and control. The report also includes a potential contagious disease prevention protocol based on current research in shelter medicine, including a recommended vaccination program that could be implemented at the rehab to reduce mortality rates.

Jasmine Coulombe; jasmine.coulombe@mail.mcgill.ca
Agricultural and Environmental Science; Animal Health and Disease
Summer 2020

A herd of orphaned fawns before feeding time! The feeder must wear a mask to prevent them from imprinting. Photo credit: Jasmine Coulombe

Jasmine Coulombe after wading through a swamp to rescue six orphaned ducklings. Photo credit: Yasmin Scott

An orphaned juvenile raccoon learning to climb trees after moving to an outdoor enclosure. Photo credit: Jasmine Coulombe

An orphaned juvenile porcupine resting after having a bowl of milk. Photo credit: Jasmine C

An orphaned juvenile porcupine resting after having a bowl of milk. Photo credit: Jasmine C
Working on an organic dairy farm at the Fromagerie Au Gré des Champs

My Experience as an Intern

My duties related to the cows were to feed them, prepare the pastures, perform the milking routine and observe their behaviour to detect any changes. I also participated in the hay harvest and the seeding of the fields. The maintenance of the farm was also part of my tasks such as fencing, fixing any leaking pipes, cleaning the stable and so on.

I was working at Fromagerie Au Gré des Champs, situated in Saint-Jean-sur-Richelieu. My internship supervisor was Marie-Pier Gosselin, co-owner of Fromagerie Au Gré des Champs. [http://augredeschamps.com/](http://augredeschamps.com/)

This internship was significant because I had the chance to learn from Marie-Pier and Daniel, who have an amazing set of values such as animal well-being, improving the environment and sustainability. With them I learned that the conventional way is not the only way to have a successful dairy production.

What I Learned

With this internship, I’ve learned how important it is for me to work in an environment built on the respect of animals, humans and the environment. It helped me find a focus for my future career.

There are many challenges when producing organic milk such as the access to pasture, the limited use of antibiotics and finding organic feed at a reasonable price. There are programs designed to relieve some of that burden, but organic producers still have to work hard and be imaginative to keep a profitable farm.

I developed new manual skills such as milking, which was a completely new experience for me, driving different tractors for different purposes, building electrical fences, to name only a few. I also learned about herd management and how to ensure that the herd’s well-being is optimal as well as their milk production.

Because of this internship, I will focus the rest of my studies toward organic production and improving animal well-being without affecting the profitability of a production.

An important lesson I intend to keep in mind throughout my career is: the importance of taking into account the climatic variations that producers have no control over as well as the time and energy needed to manage a successful agricultural production when helping and advising producers. I believe that, as a future agronomist, to have experienced farm work first-hand is essential to understand the producer's struggles and to excel as an expert advisor.

Annie-Claire Daviault; annie-claire.daviault@mail.mcgill.ca; Bachelor of Science (Agricultural and environmental science); Summer 2020

Happy cows enjoying a well earned meal! From spring to autumn, the cows spend most of their days on pasture.

Milking the cows daily was a big part of my job. The photo seems blurry because of the misting system used to prevent flies.

Maintenance was part of my job. Here I am fixing a leaking pipe.

I was driving a tractor with a trailer attached to it, used to transport the bales of hay made during the week.

Photo taken by me during the internship.
FIELD WORKER @ LA CLÉ DES CHAMPS BIO DE ST-CAMILLE

My tasks:
- transplanting
- weeding
- harvesting
- installing nets
- working at the market
I made sure that all of our field crops would go from transplant to the baskets in the best quality

Science:
- the farm is organic and is around 8 acres.
- we fight insects using nets, biopesticides and predators
- we fight weeds using plastic mulch and employees

What I learned:
- I learned how a market garden works and every nuances between crops
- I got stronger and more resilient to hard work and tough weather
- I understood how hard it is to run a farm and it questioned my will to own one
- I have a new perspective on vegetables as a buyer now that I’ve been on the producer’s side

Student name: Alex Drapeau
(alex.drapeau@mail.mcgill.ca)
Professional agrology
Summer 2020
Employer: Alexandre Cardin
(info@lacledeschampsbio.com)
My Internship Experience at the Biosphere: Remote Research

What is the Biosphere?

The Biosphere is an environmental museum that is run by Environment and Climate Change Canada (ECCC). Its mandate is to inform the public on current environmental issues and to inspire individuals to take action through presentations in their exhibition halls and along outdoor paths.

Figure 1: A picture the Biosphere (Credits: Lolo RC)

What was my role as an intern?

For the first month, my colleagues and I had training meetings over Zoom to learn background information and different scenarios that we would present as animators. Since the museum didn’t end up re-opening due to COVID-19, this knowledge was used to update videoconferences from 2010, to create numerous scientific demonstrations for the public and to do research on sustainable agriculture. The demonstrations that I created with my colleagues touch on subjects such as microplastics, wind turbines, hydrogen vehicles and oil spills.

Figure 2: Blue spruce presented during an animation (Credits: Lolo RC)

What did I learn from my internship and how did it contribute to my future career and studies?

This experience helped me recognize the importance of environmental education in society. I learned to adapt to a completely new work environment. I also was able to widely expand my knowledge on environmental issues throughout my research. The experience was so enjoyable that I’m considering returning next summer...

Figure 3: My colleagues and I in a Zoom meeting (Credits: Pierre-Olivier Gaudreault)

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Figure 4: The view of downtown Montreal from the Biosphere (Credits: Lolo RC)
WHAT DID I DO?
I worked as an R&D to develop and launch a new food product for Mid-Day Squares. I executed taste tests to come up with a nutritionally balanced and delicious ice-cream formula.

WHY THIS JOB WAS MEANINGFUL?
The ice-creams were sold as DIY kits. Due to COVID-19, the food and beverage market saw a huge increase in online sales and DIY products. These kits allowed buyers across North America to make and experience delicious and functional ice-creams from their homes!

WHERE DID I WORK?
Mid-Day Squares

WHAT DID I LEARN?
• Researched new and functional ingredients and manipulated their properties for product development.
• Practical application of Nutrition knowledge to create an optimal macronutrient profile and use Nutritional labeling software like ReciPal.
• Work with a team in a highly driven and tight knit start-up culture environment. Collaborated with co-workers across all sectors i.e. food scientists, marketing and finance.
• Work with international and local retailers to source materials for the kit like popsicle moulds, boxes etc.

WHAT DID I LEARN ABOUT THE INDUSTRY?
The food and beverage industry is ever changing and that is what makes it so fun to work in! For the same reason, competitive and requires innovation to succeed.
Ecological Farm Internship at Le Paysan Gourmand

My Experience as an Intern

My Internship was at Le Paysan Gourmand in St. Felix de Kinsey- about an hour and a half drive from Montreal.

I prepared, cared for and maintained gardens, planted and transplanted garden beds, weeded, harvested and washed vegetables, prepared weekly CSA baskets, and collected fresh eggs, fed pigs, chickens, and a calf every morning.

Learning how to produce food using ecological principles as opposed to industrial agriculture- is becoming more and more crucial for human and environmental health, communities, the economy, and climate.

What I Learned

I learned how a season on an ecological farm is managed- planning the season's crops and CSA baskets, growing and maintaining gardens using organic methods promoting biodiversity and soil health. I learned that applying harmful chemicals are not needed to obtain high yields of quality produce and growing soil is as important if not more important than simply growing a crop. I learned how to use several tools, how to increase efficiency at nearly stage of the production line.

This job was very physically demanding, and days were always very long but I learned just how quickly the body adapts and how resilient and strong it is. The rewards of all the physical labor are also great!

The average farmer today is in their mid-fifties and ecological farmers are needed today more than ever. Awareness and Interest in food sovereignty, self sufficiency, and environmental and climate health are on the rise.

I have learned an incredible amount of skills and feel confident to start my own ecological farm when resources permit.

Science

Ecological food production can significantly build soil, a crucial resource we are globally depleting more and more every season. As opposed to its industrial counterpart, it is far more resilient to climate disasters and climate change and yields foods of higher quality and arguably, quantity. It is a sustainable way to produce food indefinitely and when combined with regenerative agriculture and holistic management, has the potential to sequester significant amounts of carbon, effectively reversing carbon emissions from the agricultural sector.
Chitin and Chitosan on the Nanoscale - A review @ The Moores Research Group

My Experience as an Intern

This summer, I mostly assisted in writing a review about chitin and chitosan on the nanoscale, which is the second most abundant natural biopolymer after cellulose. For the second part, I also worked in the physical laboratory to conduct the conversion of nanochitin to nanochitosan, as we make our own chitin-based materials. Both projects were done under the supervision of Dr. Audrey Moores and PhD. student Tony Jin.

I wrote sections of a formal review paper every week or every other week. In the laboratory, I learned to use the rotary evaporator, the vibrational mill, among utilising other lab resources to complete my tasks.

Overall experience

Besides the technical skills I learned, I learned about the process of writing a review and also conducting scientific research. Most importantly, this summer due to COVID difficulties, we were unable to complete a lot of characterization instruments that we usually conduct. I really witnessed being able to adapt to the available resources and carrying on the project. Overall, I would highly recommend such an experience for undergraduate students.

References


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Food Chemistry U2
Summer 2020
Hazardous waste management at Covanta Environmental Solutions

My Experience as an Intern

I worked in the shop as an intern for the hazardous waste management team. I had to manage different types of waste and figure out which ones were hazardous or non-hazardous. I had to take representative samples of the materials to analyse them and identify why and how they will be managed to be destroyed. I also had to consolidate and sort out some hazardous waste. (photos on the left)

I learned and understood all the different materials and how they were treated as waste: Biomedical Waste, Safe and Secure Disposal of Coronavirus (COVID-19) Decontamination Materials, Hazardous materials, Finished products, Pharmaceutical Products and Cosmetic Waste. Product disposal, Recyclable Materials and Controlled substances.

I prepared and packed hazardous waste for transport regulations. I also prepared some non-hazardous shipment. Covanta has multiple branches in different areas with their own and specific services.

It is important for Covanta to improve environmental performance. Covanta Environmental Solutions promotes and maximizes the reuse and recovery of recyclable materials, energy recovery and composting whenever possible. It stands apart from the competition by unpacking and sorting finished products to extract the greatest amount of recyclable materials. Our customers also appreciate our ongoing efforts to collaboratively identify new procedures to reduce their carbon footprint. We provide complete reports of the results, for our customers to monitor and improve their environmental performance.

What I Learned

I realised how excited I am when I am doing a task that I find interesting. I was happy to go to work every morning and I was not happy to end my internship. I learned so much about chemistry and even if I did not pursue my study in chemistry after college, it is still something I could be good at because it is interesting. I learned how waste management is a subject that challenges me a lot since we are in a climate change debate everyday of our lives.

The industry of waste management is bigger than we think and there has been research going on for a lot longer than probably most people realize. Clients are not well informed of how they could reuse or recycle their own waste. I also learned a lot from companies who needed our services because most of them need us to get there to identify their products because they don’t even how to identify them for transport or even how dangerous their products/waste are.

I had to work hard with heavy materials as well as warm equipment. Summer 2020 had hot days and honestly, I had to be extremely persistent in my work. My job was very challenging, and I was never bored.

Having done this internship, I would look forward to do another internship with an engineer in this area. It would also be challenging, but I feel like it would make more sense for my future career.

I worked with different people in different areas of the shop. I was there to help and curious about everything I could learn from their work. My curiosity helped me out to understand different process as well as being able to give ideas to optimize our limited storage space. Essential workers have a lot of pressure and I was able to listen as well as replace some employees when they felt overwhelmed and needed a break.

Science

Covanta Environmental Solutions works with partners in the same area. They all have complementary skills which creates a positive competition since they all have their strengths and differences from each other. Some are more efficient in their science aspects, for example the biomedical waste management must be isolate and eliminate in a way that is both safe and responsible. Our partners are our strength. Covanta Environmental Solutions offers its clients a solution that is unique on the market: unpacking of finished products and the separation of liquid contents to optimize recycling, composting, reuse and energy recovery practices in order to divert as much waste as possible from landfills and improve the environmental footprint of our clients.

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Bioresources engineering
Summer 2020
Field assistant at HEPIA (Geneva)

My Experience as an Intern
Between fields and mountains, plants and insects, I have assisted ecologists in their field work. Projects were ran in Geneva (Switzerland) and its surroundings.

I mainly did plant surveys with a specialist, but also worked by myself on soil microfauna capture and recognition. Additionally, I help in other projects such as setting up weather stations on roofs to record microclimate or for plant association mapping.

In the office, I retransmitted data on Excel and started the statistical work. I also help in organising their herbarium, preparing labs and working on photos for a future book.

My work was significant as during 3 months of confinement due to Covid 19, they were extremely late on sampling and recording data. I replaced scientists so they could work on other late and important projects.

What I Learned
I have discovered many sampling techniques for plants and insects. I now know how to run a project in ecology, with all the variables to take care of, and the precision required for relevant results.

I learned about myself that I truly love nature but I am not ready to devote my life for plants.

I realized that working in plant ecology requires a deep passion for plants. A good memory and perseverance are required to provide work with high precision.

I memorized many European plants and flora recognition technics. I have developed stronger abilities to use Excel and statistics to for data interpretations.

Having done this internship, I will orientate my studies more towards global environment than applied ecology.

Science
Plant ecology is the center of all the research in HEPIA. Projects include testing a variety native seed mixt to revegetate different terrains, finding the best quantity and quality of substrate for green roofs and plant association cartography.

Hence, many plant surveys are realized, we also recorded the microclimate and the insect diversity. Data is collected over multiple years to measure the evolution of the sampling terrains.
Food R&D Internship@ Zenxin Agri-Organic Food

My Experience as an Intern

I was assigned to develop new food products including peanut butter, almond butter, and quinoa snacks. I was given the freedom to decide on how I want the projects to be carried out.

Initially, I depended on peer-reviewed journals to produce those food products. However, I realized there were many variables to take into consideration to produce new food products with the desired qualities. For example, the temperature and time required to roast the nuts to obtain the ideal texture of nut butter vary due to the variation of the nuts and the oven used. Other than that, the company I was interning for wanted me to develop a type of quinoa-based snack that is crunchy and granulated. This product is new to the market and there were no direct recipes/scientific journals about it. Hence, I utilized the knowledge that I obtained from McGill University and did researches about the chemical and physical properties of the food components to be able to understand the foundation in developing new food products.

This internship has enabled me to practically apply the knowledge I have learned throughout my courses. For example, the subject food chemistry enabled me to understand chemical compounds in food; thus, allowing me to be aware of the changes in food during processing and storing.

What I Learned

Through this internship, I learned that I am resourceful and persevere in completing the projects I have started. I have done a lot of research to produce new food products with desirable qualities. I develop methods to produce new food products using the information I got online and scientific journals. I did not cease trying to find the best method to produce high-quality new food product although I met many obstacles and failures along the way. After a great many trials and errors, I succeeded in producing new food products that are approved by the director of the company.

The food industry is very dynamic. Although the cost to develop food products is high, food companies are willing to produce new food products to remain competitive among the food industry. Producing a new food product takes time which subsequently increases the cost; therefore, it is important to have a strategic planning process.

I learned to accept criticisms. In the past, I found criticisms demotivating, but it is otherwise now. Criticism reminds me that there is room for improvement which pushed me to work harder to improve and develop high-quality food products. Without criticism, I would have thought my work was sufficient and not put the extra effort to further improve my performance. Besides that, I developed good verbal communication skills which enabled me to lead a conducive environment for sharing ideas and efficiently solving problems. For example, I delivered my thoughts transparently and actively listen to my colleagues which has resulted in a more orderly work.

Having completed this internship, I aspire to work in the food research and development sector of big companies after graduation to acquire a more systematic approach to develop new food products and gain more experience. In the far future, I would like to have my own food company and produce gastronomic food.

Science

In this internship, it is important to understand the physical and chemical properties of food.

Nut butter project: Nuts have to be roasted at a specific temperature and time to ensure the optimal amount of oil inside the nut cells to leak out to the surface of nuts and hence, resulting in a creamy nut butter of acceptable colour. However, roasting time and temperature of nuts will affect the oil stability and consequently the shelf-life of the nut butter.

Quinoa snack project: To produce a granulated quinoa snack, corn flour is added to the sugar syrup which functions as a binding agent. The ratio of water to dry ingredients has to be precise to produce crunchy quinoa snacks as well as low moisture content to ensure microbial stability.

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BSc in Food Science
Summer 2020
Content Creator at the McGill Herbarium

My Role

During the summer, I worked remotely as an assistant content creator. I created a children’s plant-inspired colouring book entitled ‘Busy Plants’. My role entailed writing the book’s content with the help of the McGill University Herbarium Curator, Dr. Frieda Beauregard. Another intern drew the illustrations. The book covers various plant ecology topics such as plant defense, seed dispersal, phytoremediation, etc. I also created guides on ‘How to make an Herbarium’, ‘How to make a Plant Press’ and ‘How to make Fragment Folders’.

What I have learned

I researched many plant ecology topics throughout this internship and described these topics in concise, simple terms. I learned many new facts about plants.

I have enhanced many of my skills.

❖ Compressing scientific information
❖ Communicating opinions with colleagues
❖ Utilizing online platforms (Microsoft Word, Powerpoint, McGill World, GBIF database)
❖ Drawing botanical illustrations using MediBang Paint
❖ Organizing my goals and managing time

McGill University Herbarium

The McGill University Herbarium is a natural history collection of dried plants comprised of over 140 000 specimens. The collection was founded in 1856 and moved to the Sainte-Anne-de-Bellevue campus, where it has been residing since 1972. The exhibition serves to be a research tool for studying plant diversity and identifying and conserving plants.

The herbarium also aims to produce outreach content to engage the public in plant science and botany. As part of this outreach project, the colouring book and herbarium guides will serve as fun activities to educate and engage the public about plants.

Take Away

I gained a greater passion for plant ecology and hope to pursue a job where I get the opportunity to study plants. I also learned that I do not enjoy working remotely and, in the future, will choose projects or a career that involves more fieldwork. Furthermore, this internship has made me more confident in my ability to learn and apply new knowledge.

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Environmental Biology - Applied Ecology
Summer 2020
Assistant Content Creator at the McGill Herbarium

My Experience as an Intern
This summer I created media content for the Herbarium website. This included two projects where I created:

1. A floral survey of Sainte-Anne-de-Bellevue with accompanying pictures and descriptions.
2. A scavenger hunt of 25 plants in Sainte-Anne-de-Bellevue for the town occupants to complete.

These projects were important to incite public interest in plants. Especially during a pandemic, the scavenger hunt would be a tool for people to participate in an activity at a safe distance.

I worked at home all summer because of the COVID-19 pandemic. This set-up accommodated my work since I spent most of my time outdoors.

What I Learned About Botany
Through this internship, I learned a few things:

1. I enjoy bridging the gap between scientific research and community involvement.
2. Identifying grass species is very difficult.
3. Global Natural History Collections are extensive and although they run independently of each other, a yearly conference is hosted to explain their work.

I developed my plant identification skills along with my overall knowledge of plants. I can now describe the major characteristics of certain plant families.

This internship nurtured my love for plants even more. I will continue my studies in plants and perhaps continue to graduate school in this field.

Plant composition of Sainte-Anne-de-Bellevue
The scientific research I did this summer consisted of identifying the plant species of Sainte-Anne-de-Bellevue. I practiced using a microscope to characterize plants by their floral traits such as the composition of their gynaecium and androecium. Most of my work took place outdoors as I was sampling many plants.

You can refer to Figure 4 to see the areas I visited.

Through this list, other naturalists may practice their identification skills in the area. Other scientists may use this list to analyse the ecosystem. Students of Macdonald campus may use it in their own studies of plant ecology.

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Environmental Biology
Summer 2020
Edible Insect Production at TriCycle

My Experience as an Intern

I did my internship in a yellow mealworm farm located in Montréal. This company is part of a circular economy network as insects are fed with local food residues. The farm is also part of an urban agriculture cooperative. This internship was a great example of alternative food production.

Most of my internship consisted in helping in the production and conducting experiments to optimize the processes. The tests I carried were directed toward two main axes: the treatment of the inputs (insects’ feed) and the processing of the insects.

The inputs are food residues that need to be dried and grinded. I tested different drying parameters and different grinding equipment to determine which methods and paths are the most efficient. I became more confident using new tools. I also tested the quality of the product obtained with the different methods. After testing, I prepared protocols and created workshops for my colleagues. I conducted similar tests for the drying and grinding of the insects, but with different appliances.

In parallel, I was also helping in experiments testing insects’ dejection (frass) as fertilizer and new insects’ feed. The effects of the fertilizer were observed in various cultures grown on the roof of the building. Tasks related to the experiment included measuring and weighing the plants. As for the experiment involving new insects’ feed, it consisted of preparing the different mixes and taking measurements of the larvae growth and density.

What I Learned

This internship was my first experience with edible insects. As the farm is still small, I had the opportunity to experiment each step in the production, and even beyond. I learned more about the requirements of the insects at each stage of life and the considerations to follow to produce food. I also learned more about the commercialization of food product and the challenges associated with edible insects. I observed that this field is in quick development, but that people are not open to it yet. Also, there are still many grey zones in the regulations around insects for feed and for food.

Through the summer, I met with some collaborators including the microbrewers, the baker and the vegetable distributors from which we get the inputs. Doing so, I learned more about the local food procurement chain. I noted that transportation and cold storing are main barriers for implementation of circular economy networks.

On a personal level, the creation and the execution of controlled experiments gave me useful insights on conducting research and challenges associated with it. I developed a better understanding of experimental design and this will be useful to ensure the scientific rigor of future experiments. In this internship, I put in practice and strengthened organization skills by managing multiple time-sensitive tests simultaneously. I also became more confident in defining, prioritizing and planning tasks.

This experience confirmed my interest and fostered my motivation to support alternative food sources.

Science

The potential of frass as a fertilizer was confirmed by an experiment with edible plants. The germination and growth of common plants from different families (curcurbidacea, solenacea, brassicacea) was evaluated. The effects of frass were similar to those of chicken manure, and were particularly positive for leafy greens.

In terms of insects’ diet, addition of yeast seems to have a major positive impact on the growth rate of larvae. It also seems to be appreciated by the adults. Other ingredients are being tested.

Drying larvae with the microwave was time-efficient and improved their color. However, according to the literature, protein solubility is decreased by this method. The water activity might also remain too high for a long shelf-life. Also, more lipids were preserved in the microwave dryer, resulting in a heavier and more granulated powder.

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Bioresource Engineering
Summer 2020
Firmware Engineering CO-OP

I wrote embedded software for one of the Ford MCU modules. I wrote code for the bootloader, including some scripting in python for packing the binary image. I also wrote drivers to support different communication protocols in the car and between chipsets. Finally, I wrote some test utilities, in order to test the functionality of the drivers and ensure the hardware and software was working together as it should. The indicated layers of the embedded architecture are where I was involved.

I learned so much. Going into this internship, the programming I’d done had been more high-level machine learning scripting in python. In 4 months, I learned how to navigate the bash console effectively, how to automate bash and windows terminal tasks, write embedded software in C language, pack binary images in python, sign code, use makefiles, manipulate root filesystems, create tests etc. Long story short, I learned how to solve technical problems in embedded. This has confirmed my interest in software, and has opened doors for me to pursue a software engineering career.
COVID-19 Food Access Project At McGill’s School of Human Nutrition

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My Experience as an intern:
This summer I did my internship remotely with Dr. Daiva Nielsen at McGill’s School of Human Nutrition. The purpose of my project was to evaluate the food access of Quebec households during the period of lockdowns in Quebec from March 13th, 2020 – May 4th, 2020 as a result of COVID-19 pandemic. The results provided valuable information about the food shopping behavior and food safety of Quebec households during the pandemic and aimed to add to the public health messaging regarding food access during the COVID-19 pandemic.

What I learned:
Through this 16-week remote internship I learned a lot about the designing and planning a survey research study, trained my brain to criticize scientific literature and the data each paper provides. I also gained some technical skills from editing and managing a McGill website to using statistical softwares like JMP and SPSS for data analysis as well as using R to make a map of Quebec. My responsibilities included editing the survey questionnaire, programming it on SurveyMonkey, reaching out to news websites like MtBlog and McGill Daily for advertisement of the survey links as well as advertising on social media platforms like Facebook groups. I was also in charge of managing www.mcgill.ca/covidfoodstudy website. When collecting the results, I helped with data analysis and made a map of Quebec using R to see which areas of Quebec needed to be targeted more. I later used SPSS and JMP to further analyze data regarding participant characteristics and online grocery methods used during the lockdown period.
Having done this internship, I am more motivated to pursue a graduate degree in Public Health or Epidemiology. My experience this summer could be an asset to me in these fields in the future.

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A map of Quebec by me using R. Different shades indicate the number of respondents we had as of June 4th, 2020 in each region of Quebec.

Science:
This project consisted of designing a survey, advertising it on social media and analyzing the data for a scientific paper to be published. It consisted of a primary survey and two follow-up surveys as the COVID-19 situation changed in Quebec. The scientific aspect of this study relied heavily on statistical analysis of the survey results and translation of the result to an easily communicable format for informing the scientific community, general public and public health agencies.
Our results from the primary survey indicated:
- During the lockdown period, the use of no-contact grocery shopping (online grocery shopping, grocery delivery or curbside pick-up) and disinfection of food products bought increased significantly.
- Although most households had enough food available, 12% indicated they were skipping meals or reducing food intake during the lockdown period. Stress, household job impact and 14-day self-isolation were recognized as risk factors for the reported reduced food intake.
My Experience as an Intern

What I did
I performed research and development for the design of a solar greenhouse including an aquaponics system within it. I also participated in the building assessment of a condominium in downtown Montreal as well as the preparation of structural plans for a house extension on a waterfront property in the flood zone. Some of the administrative work that I did included configuring site visit report templates, creating a dynamic stamp for the engineers of ALTE to use on electronic plans and developing a spreadsheet that calculates key requirements for concrete structures.

Where I worked
I worked mainly remotely or at a the research and development site in Notre-Dame-de-l’Île-Perrot just outside of Montreal where I only worked with my supervisor.

Its importance

Human safety is the most important consideration for engineers. By conducting building inspections and properly planning construction plans, engineers are promoting safety. Secondly, creating sustainable systems such as aquaponics systems promotes the wellbeing of our planet.

Science
Concepts of heat transfer, stress and strain within structures, fluid dynamics, ventilation, sustainable innovation, flood prevention measures, aquaponics system development were all used. Nearly something from every course in the bioresource engineering program was reinforced or used during my internship.

Acknowledgements
I am very appreciative of the opportunity that I had as well as the class of 65’ for funding my internship. Any type of real world experience working in your field prior to graduation just validates the importance and relevance of your education. I am thankful for this course and would like to thank Ms. Kendra Gray for running it.

My Experience as an Intern

What I learned

Self-learning
I found out that I really enjoyed working for a cooperative where there isn’t much of a hierarchy and hours are flexible. I also learned that I am not passionate about structural engineering.

Industry learnings
I learned that oftentimes there are delays of projects. Estimating the time it will take to complete a project is a difficult task and near impossible to get exact. As a result, it is good to over plan.

Acquired skills
I learned to read fan law charts, use psychrometric charts for ventilation calculations, use a rotary laser to acquire elevation data, operate various machinery such as jigsaws, drill presses and band saws, solder, assemble tubing and piping configurations, improve my AutoCAD drawing abilities, calculate load bearings on structures and assembling building assessment reports. I also developed my French speaking skills.

From this point on
I will definitely pursue a job with a cooperative later on in my career after I have gained more skills elsewhere that I can put to service in their operation. I think that I will need a lot of guidance and direction as I start out and therefore receiving orders from a boss would be helpful which does not happen as much within a Cooperative since you are your own boss.

Acknowledgements
I am very appreciative of the opportunity that I had as well as the class of 65’ for funding my internship. Any type of real world experience working in your field prior to graduation just validates the importance and relevance of your education. I am thankful for this course and would like to thank Ms. Kendra Gray for running it.
Writer at Näak

My Experience as an Intern

As an intern at Näak, I was responsible for writing, editing, and promoting content for the company’s website. I came up with article ideas, conducted research for each post, wrote in an engaging and clear manner, implemented SEO strategies, found or took relevant photos to include with the article and formatted each article for publishing. I also took on several mini-projects which included writing plant-based nutrition plans for the company’s community, developing recipes, and writing product descriptions.

The Significance of the Job

I helped establish a brand voice and gave the company something to share on social media channels. I also helped the company reach out to a broader audience and boosted the website’s traffic. Originally, I was supposed to work at the office located in Montreal, but due to the current circumstances, I worked in my apartment in Montreal.

What I Learned and Discovered

• How to condense scientific literature into a user-friendly format that can be understood by the general population.
• Marketing skills that helped me write more effectively.
• How work in a non-standard environment due to COVID-19 circumstance.
• How to communicate and collaborate effectively and efficiently online with other despite a large language barrier.
• What I discovered about myself was that I work well in a certain way: I like to dedicate certain time slots to specific tasks in order to have more discipline, which was important especially when working from home. I also learned that I enjoy reading scientific literature as it is engaging to read about the latest developments and discoveries.

Insight in the Industry and Future Plans

Regarding the sports nutrition industry, I learned how much misinformation was out there: marketing and packaging of food and information is sometimes extremely misleading or sometimes even flat out incorrect. I also noticed an increasing awareness in the industry on sustainability: more companies are now moving towards eco-friendly ways to develop and produce food products.

Having completed my internship, I will continue reading scientific literature on a daily basis, writing and trying to improve my skills as a writer. From a career standpoint, Näak opened my eyes to the field of food security and sustainability, which is an industry I hope to pursue in the future.

The Science

The science part of my internship was conducting in-depth scientific research on many different topics. I focused a lot on sustainability, especially how insect protein is an eco-friendly source of protein and read scientific literature that quantified its benefits for the environment (including how much land mass/feed insects require compared to animals, etc).
**WHAT DID I DO?**
This summer I was an assistant to the animal health technicians at the Victoria Veterinary Hospital located in Verdun (MTL).

**WHAT DOES THAT ENTAIL?**
- running blood/urine analysis
- handling the animals
- preparing vaccines/medication
- etc.

**WHY WAS I IMPORTANT?**
I was always the extra pair of hands around the clinic. Wherever they needed my help, I would be there to assist.

**WHAT I LEARNED**
- small animals are very good at hiding their pain
- we must be very attentive
- every piece of information is relevant

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**Rosie**
12-year-old non-spayed female dog

**Presentation:**
- lethargic, appetite & weight loss, vomiting, excess drinking & urination, constantly trembling, sensitive abdomen, vaginal discharge

**Diagnosis:**
- pyometra + urinary tract infection

**Treatment:**
- sterilization surgery + antibiotics

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**Suske**
5 month old non-spayed female kitten

**Presentation:**
- limping from the front right paw without putting any weight on it

**Diagnosis:**
- diaphyseal fracture along all 4 metacarpal bones with a slight deviation to the right

**Treatment:**
- application of a cast to affected leg for 4-5 weeks

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**Loke**
8-year-old castrated male cat

**Presentation:**
- appetite & weight loss, vomiting

**Diagnosis:**
- chronic non-specific inflammatory bowel disease

**Treatment:**
- B12 supplementation + antibiotics + diet change

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**Smookey**
5 month old non-spayed female kitten

**Presentation:**
- fast, abnormal and forced breathing + heart murmur + dilated abdomen

**Diagnosis:**
- congenital cardiac disease

**Treatment:**
- furosemide + low sodium diet

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Life sciences; animal biology
Summer 2020