FOOD AT THE UNIVERSITY OF MANITOBA

A SUMMARY OF CURRENT ACTIVITIES AND PROGRAMS, WITH ADDITIONAL NOTES ON CHALLENGES AND OPPORTUNITIES

JUNE 2015

University of Manitoba | Office of Sustainability

NOTE TO READERS

The intention of this document is to feed into a process where University students, staff and faculty can work together to make intentional changes to the University food system. If you are interested in or inspired by any of the information that you find in this document please do not hesitate to contact the Office of Sustainability to propose a project or start a dialogue.

The University is constantly changing, so some of the information contained in this document may no longer be accurate.

ACKNOWLEDGMENTS

Many members of the University of Manitoba community contributed their time, insight and expertise to this research summary. Of particular note is the extensive role that students – through coursework, as volunteers, and as Research Assistants – played in conducting primary research. As well, technical advice and research assistance was shared by Meal Exchange, Sierra Youth Coalition and Food Matters Manitoba. The Office of Sustainability is sincerely grateful for the diversity of input and support received throughout this project.

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PREFACE

Food is very important. Food has personal, local, regional and global impacts. These impacts are manifest in every activity within the food system – from production to waste, and back again – and in every time scale, with wide ranging implications for social, environmental and economic development. For these reasons, understanding food systems and how to facilitate positive change in those systems is critical to sustainable development.

University campuses are places of significant research and innovation and have the capacity required to develop the framework to support practical applications of sustainable development concepts. As academic leaders they have the capability to convene academic disciplines on large, complex issues, mobilize resources, create incentives and programs for faculty development and most importantly, to lead by example.

The University of Manitoba has a proud history of supporting research and education on food systems, and maintains a mission to create, preserve and communicate knowledge, and thereby, contribute to the cultural, social and economic well-being of the people of Manitoba, Canada and the world. Together this focus and direction has yielded a large number of innovations and improvements in practices – a necessarily small sample of which are profiled in this report.

Past and present strategic priorities for the University show a clear alignment with work on food systems – beyond academic priorities, food has a role to play in supporting academic excellence, fostering indigenous achievement, campus wellness and creating an outstanding workplace and learning environment. Over the last couple of years, the University's focus on food and food systems in the context of sustainable development has been renewed through a sustainability policy (2011), sustainability strategy (2012) and a renewed strategic research plan (2014, for the period 2015-2015) which includes a research theme centered on Safe, Healthy, Just and Sustainable Food Systems.

For all of these reasons, a deeper understanding of the food system and food system-related activities at the University of Manitoba is critical to continued planning, innovation and impact. In 2014 the Office of Sustainability with input and support from the student-led Campus Food Strategy Group initiated a research project to assess objectively and report on the current state of food at the University. The framework used for the research was an ambitious and comprehensive set of indicators that were developed with input from food system experts at the University and in the community. Research methods included interviews with leaders and experts, site visits and reviews/analysis of program reports. Where possible and appropriate, quantitative information was gathered, supported by qualitative findings including photographs and case studies such as research highlights. Reflections on possible future directions, although not strictly within the scope of the project, were noted and are reported at the end of each section.

The resulting report – Food at the University of Manitoba – was released as a draft in March 2015, and was refined through feedback from the community before finalized. Both the draft and final version of the report are intended to support dialogue and action on food at the University, in support of University and University-community priorities.

INDICATORS AND FINDINGS

Indicator	Unit/Measure	What We Found
PRODUCTION		
1. Food grown to eat (yield)	kg, L	A variety of production reported, but largely not tracked by weight/volume. See pages 27-30.
2. Use of food grown, processed, produced (which food service providers are currently using food produced and processed on campus)	n/a	Degrees as well as St. Andrew's, and St. Johns College use fresh produce from campus. See pages 28-30, 41.
3. Food grown, produced for research	kg, L, ha	A variety of foods are produced for research on Campus as well as on research stations, with some of the foods findng their way back onto campus for consumption. Due to the way data is tracked, an aggregrate number can not be extracted. See pages 35-37.
(i) Crops	n/a	Crops are grown for research and furthering genetic studies at Ian N. Morrison Research Farm. See pages 24-26.
(ii) Animals	n/a	Beef cattle, dairy cattle, pigs, poultry and sheep are and have been involved in research both on campus as well as at Glenlea Research Station and the Ian N.Morrison Research Farm. See pages 35-37.
(iii) Food products	n/a	Food is produced in the Dairy Science Building, Ellis Building, and Weston Sensory Research Centre – NuEats. See pages 39-40
4. Fruiting trees	# fruit harvested	There is potential for future inventory research regarding the amount of fruit produced and harvested from the trees/shrubs.See page 27 and appendix 4
5. Diversity of production (breeds, genetic)	#, qualitative assessment	Primary research is through Glenlea and Ian N. Morrison Stations. See pages 24-26.
6. Seed Saving	#, seed type, types of programs	UMSU Community Garden practices seed saving and hosts workshops on seed saving.
7. Availability of land for development/growing (current, total potential)	ha	Data can be collected from Campus Re-Visioning plan for information regarding land availability.
8. Water quality in surrounding area	Total nitrogen, phosphorus, TSS,e. coli	Analysis of water quality would be completed upon request.
9. Soil quality	pH, electrical conductivity, respiration rate, texture, bulk density	An overall soil report is available through the University. For specific sections of the land, in particular the community gardens, a localized soil test can be completed.
10. Food processing	#, types of food, types of courses	There are number of courses available that are dedicated to food processing, health and quality. See Appendix 11.
11. Faculty engaged in production	#, types of programs	Four major Faculties in the University offer courses related to production or the Sustainability of production. See Appendices 2 and 11.
12. Students engaged in production	#, types of programs (courses, student groups)	Students are engaged in hands-on training typically in graduate study programs, while some undergraduate students have mini field projects. Students can also participate in activities such as the Community Garden. See Appendix 11.

INDICATORS AND FINDINGS

CONSUMPTION		
RETAIL		
13. Food venues on campus	#, distribution, size, description	There are 17 main food venues on campus and many options within those venues ranging from single spots, cafeteria style to sit down restaurants. See pages 50, 65 and Appendix 12.
14. Food venues, including grocery stores, off campus, within 15 minute walk or bus ride	#, distribution, size, description	46 locations, including grocery stores, farmers markets, restaurants and fast food locations are within the radius. See page 69.
15. Menu offerings at each venue	# of offerings that are vegetarian, vegan, halal, gluten free, more	12 venues on campus offer specialty foods that cater to allergies, preferences, or culturally appropriate diets. See pages 68-69.
16. Geographic distribution of specific menu types	Mapping	Can be constructed for further drafts of document.
17. Value of food retail	Total annual sales; average transaction; average per capita expenditure	$16 million is estimated to be spent on campus in food retail services. Average transaction prices were not obtained for this report as of yet. See page 66.
18. Customers served	Total annual meals (by meal time)	Approximately 40% of students, staff and faculty eat one purchased on campus meal per week. See page 66.
19. Food service workers' wages	Average hourly wage	Wages were not included in document at this time but can be if needed at a future point.
	Other benefits (unionization)	Same as above
20. Vending Machines on campus	#, distribution, items being sold	60 vending machines on campus with snack foods and beverages. Healthier options are on sale in machines near Frank Kennedy. See page 68.
FOOD LITERACY		
21. Food/nutrition resources available	#, qualitative description	There are total of 12 groups/organizations on campus to help with food education and questions. See pages 69-70.
	Nutrition information available at point of sale	Not available at vending machines but at food retail locations throughout campus. See page 71.
22. Food skills	# available food related skills courses/workshops/ training available	There are total of 12 groups/organizations on campus to assist students. See pages 72, 74 and 75.

INDICATORS AND FINDINGS

FOOD ACCESS		
23. Food skills	self-described level of food skills (survey)	Most students were not meeting their daily food requirements and were unsure how to prepare meals for themselves. See pages 69-70.
24. Accessibility	Average meal cost, average healthy meal cost	Due to tracking capabiltiies, this data was not collected at the time of the document, but can be considered for a final draft.
25. Culturally Appropriate Food	# of culturally appropriate food options, type of options offered, location of options offered	Five locations on campus offer culturally appropriate food. Specifics regarding what type of food it was not looked at, but could be for future reports. See pages 66 and 68.
26. Perceived availability of healthy food options	Survey	A similar survey was completed to analyze what students enjoyed about Campus Food Services and what could be improved upon. See page 67.
27. Food bank use	# of users	There are over 70 food banks on campuses across Canada. An exact number of users of the U of M food bank was not obtained for this report.
28. Food options at the food bank	Qualitative assessment	Basics such as pasta, canned fruit, vegetables, and soups are readily available at the food bank on campus. Types of food will always vary. See pages 61-63.
29. Drinking water availability	# of stations, type, distribution	Not looked at for this report, but water bottle filling stations are widely available in campus buildings.
FOOD PREPARATION		
30. Food preparation spaces (teaching, lunch rooms, residence)	# by type, distribution, accessibility, description	Most faculties on campus provide facilities for students to warm up meals as well store food but few offer areas to actually prepare meals. Spaces are available to many residents of campus as well as in their dormitories. See pages 71-75.
31. Energy	Total annual energy use of food service operations (kWh)	No data was available for assessment.
32. Energy efficiency and conservation	Use of Energy Star equipment, description of energy programs	Some use reported, but no comprehensive data available for assessment.
PROCUREMENT (PURCHASING)		
33. Value of food purchased	$ - total annual and by season	These numbers were not available for this report at the time of compilation.
34. Local food	$ annually	Exact dollar amounts were not calculated although Aramark attempts to bring in foods produced within 75 miles of campus.

INDICATORS AND FINDINGS

35. Ecological food	Total $ annually and by type of certification	At the time of report, there was no confirmation of what products are ecologically sourced, but when possible, the University would obtain food from ecologically sound sources. See page 57 and Appendix 10 for information on local foods.
36. Humane food	Total $ annually and by type of certification	No numbers were available, but the campus tries to use grass-fed products as well as free-range when possible.
37. Fair Trade food	Total $ annually and by type of certification	No numbers were available, but the campus purchases Fair Trade chocolate and coffee. See pages 54-55.
38. Whole foods vs processed food purchased		Campo in UMSU makes the majority of foods from scratch with fresh ingredients. Degrees, St. Johns and St. Andrew's College makes all food from whole versus using processed foods. See page 46.
39. Number of local farms and producers being supported	#, qualitative assessment	34 local producers and farms are utilized as sources and suppliers for the University of Manitoba. See Appendices 6 and 10.
40. Current purchasing policies	Qualitative	Purchasing policies are outlined and guided by the University of Manitoba. See pages 51-54, and Appendices 7 and 8.
41. Food brought from home/off campus	# of meals, description, economic value	75% of students, staff and faculty take meals/snacks from home for either saving money or for specific dietary needs. See page 72.
42. Food purchased from retail outlet off campus	# of meals, description, economic value	70% food brought into campus has been purchased at retail stores, while 30% has been purchased at restaurants. See page 72.
FOOD WASTE		
43. Volume of pre-consumer waste	Total kg	In depth research was not compiled for the document although information is provided regarding what types of pre-consumer waste is created. See pages 77-78, 81.
44. Volume of post-consumer food waste	Total kg, kg per capita	An overall chart was provided detailing the amount of post coinsumer waste per country. See page 80.
45. Waste stream	% of waste stream that is food waste; % of food waste that is organic; % of organic food waste that could be composted using windrow-type composting	The section discusses what waste is created at the University of Manitoba and what methods have been implemented to reduce the amount of waste returning into the energy stream. See page 83.
46. Student awareness on waste reduction	# educational initiatives student focused	The OOS has demonstrated through posters and direct awareness campaigns, the various ways students can contribue to reducing waste on campus. See pages 84-86.
COMPOST		
47. Who is composting on campus?	#, type, qualitative	A variety of composting programs are currently in use at the University handling an estimated 60 tonnes of organic waste. See page 85.

1. UNDERSTANDING FOOD SYSTEMS

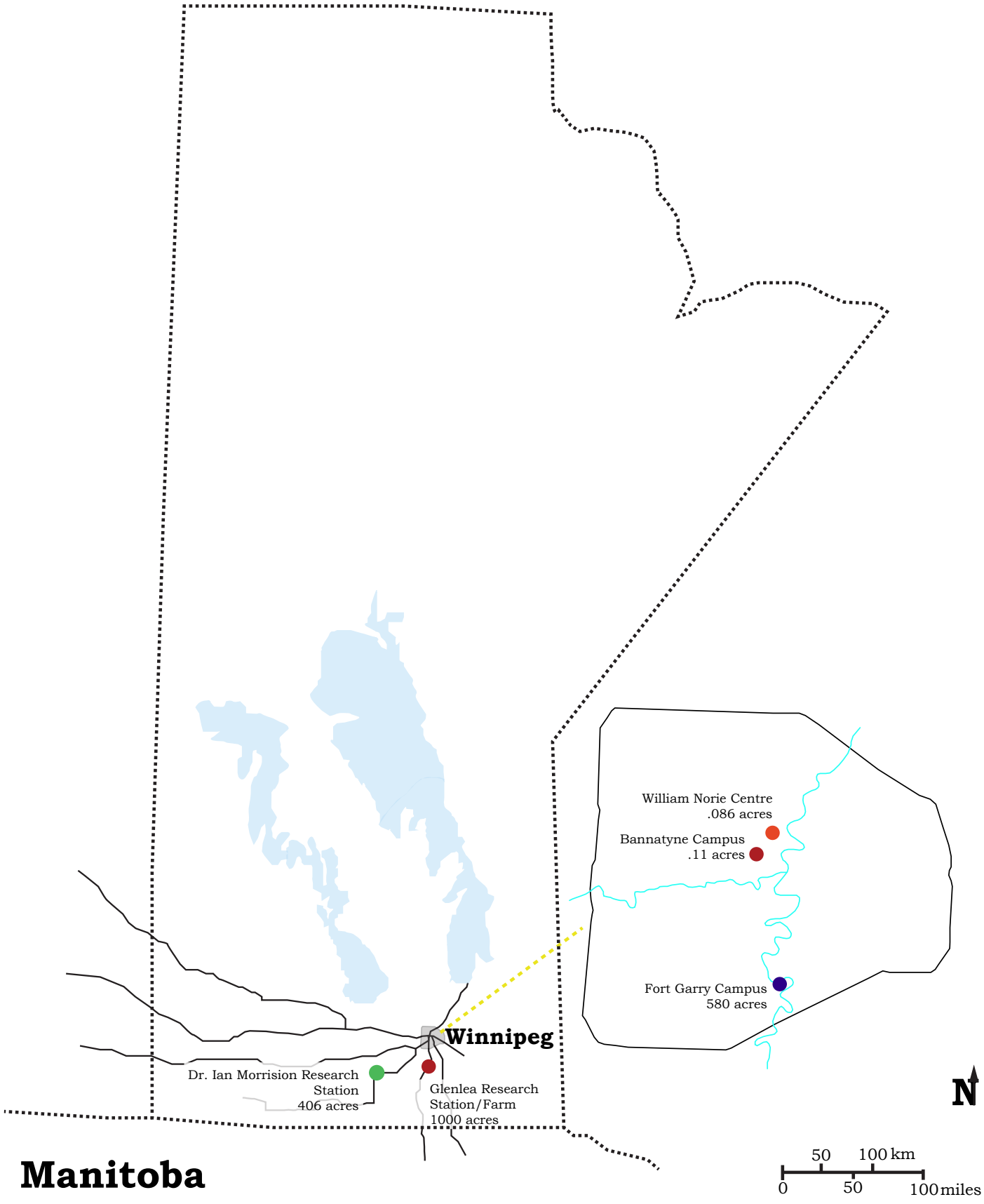
Food is a major sustainability concern. The amount and quality of food we have access to impacts our wellbeing. Food is a major component (up to one-third) of global environmental footprint, and food is a major economic driver in Manitoba and Canada alike. Food is part of our personal and cultural identity, preparing and consuming food is a major social activity, and is a significant household expense. We interact with food every day, in many different ways.

As a home to research and education, universities are a natural niche for dialogue and innovation around food systems. Many students are basing their decision of where to go to school on the food services offered (Local Food: Canadian schools, campuses and health care facilities speak up, 2013). Collectively, North American Universities and Colleges are the twenty-seventh largest economy in the world (Local Food: Canadian schools, campuses and health care facilities speak up, 2013). As large food buyers, these institutions have the potential to provide stable markets for local food production by supporting the communities where they are based, reducing their environmental impact, and serving as a model for surrounding institutions and businesses.

At the University of Manitoba, as at many major institutions, food is a hot topic. It factors into strategic priorities of student experience, research, Indigenous achievement, wellness and sustainability. Through the University's sustainability planning process and through the process of renewing the University's food service contract, a variety of suggestions for changes to the campus food system have been made – and many have since been implemented.

In support of taking action on these community demands in a strategic way, this summary report attempts to present a snapshot of the current campus food system by compiling research on forty-six food system indicators. These indicators were assembled from extensive literature reviews and vetted by food system experts at the University of Manitoba and in local food research groups.

The scope of the food system assessment includes all three University of Manitoba campuses and all facilities that house research being conducted by faculty and staff. For the purposes of this report, all campus locations at the University of Manitoba will be referred to as 'campus'. Specific reference will be made to individual campuses, Fort Garry, Bannatyne and William Norrie Centre, and/or research facilities when discussing activities at a specific location. In this report the food is used to include both food and beverages.

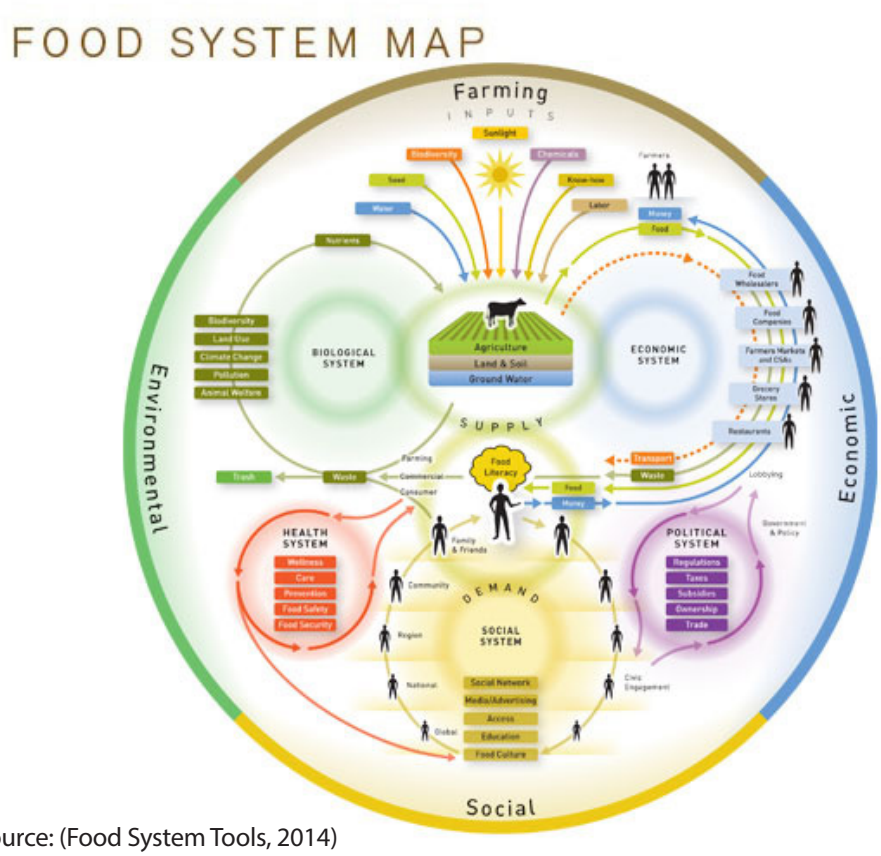

William Norie Centre
.086 acres
Bannatyne Campus
.11 acres
Fort Garry Campus
580 acres
Winnipeg
Dr. Ian Morrision Research
Station
406 acres
Glenlea Research
Station/Farm
1000 acres
N
50 100 km
0 50 100 miles

Manitoba

This paper is intended to serve as a starting point for dialogue and present a summary of what is currently known about food in specific research areas. While every attempt has been made to be accurate and inclusive in gathering and presenting research findings, the complexity of the food system necessitates that not all aspects can be assessed or reported on.

What is a Food System?

Food systems are fundamentally complex. Food exists in a system that is influenced by economics, politics, society, culture and environment. The term "food system" is used to describe the complex and interconnected activities of agricultural food production, processing, marketing, consumption, and waste (Berman, 2011). Food systems can be viewed in a variety of contexts, including industrial, conventional, globalized, organic, sustainable, fair trade, or local food systems (Reisch, 2013). "Food systems" is an emerging area of interdisciplinary study that brings together scientists, social scientists and humanists to help address the cultural, social, ecological, physical, ethical and political aspects of "food" (Berman, 2011). Food systems are an integral component of agricultural urbanism which focuses not only on looking at food systems as a whole, but creating visibility of food, accessibility, cultural diversification, zero waste and most importantly, a sustainable infrastructure when planning communities or cities.



Source: (Food System Tools, 2014)

The globalized industrial food system is resource intensive and has major impacts (both positive and negative) on the environmental and social wellbeing of communities. While economically productive, other industrial food system outcomes include widening the distance between producers and consumers, soil degradation, water pollution, loss of biodiversity, native habitats and animal welfare (H.C.J. Godfray et al., 2010). Food system sustainability is a critical issue at both local and global levels.

A resilient and sustainable food system is one that addresses economic well-being of producers and consumers, but also environmental impacts and human health outcomes (Burchi, Fanzo, & Frison, 2011). The figure below provides a visual of how different components of the food system are connected. Local, diverse, and ecologically sustainable food initiatives are increasing across the country, including eco-certification, regionally focused restaurants and food markets, and healthy supply chain strategies that link informed consumers to local producers.

University of Manitoba Food System Assessment: The Foundation of Food System Planning

A key step in understanding the University of Manitoba food system is to conduct a baseline assessment. This assessment can serve as a reference point that can help track the impact of changes, including natural changes and intentional/strategic change to the system over a period of time. The assessment helps identify areas of the system that are not being measured and informs discussions that can generate solutions and opportunities for collaboration. Some understanding of our baseline will allow us to compare our food system with the larger community food system and with other institutions; differences may point us to opportunities. Part of the research process for this assessment included bringing people together that represent different parts of the food system in order to identify potential opportunities, areas of interest, and innovative ideas (see Appendix 1 for key contributors). Having a diverse network of engaged stakeholders is essential to a campus' ability to move forward on creating inclusive local and sustainable food programming.

It is intended that the University community, with support from the Office of Sustainability and involvement from a wide range of stakeholders, can use the information, energy and ideas in this assessment to develop a campus food strategy that will develop a resilient food system that supports University strategic priorities and contributes to sustainable development.

What is the Campus Food Strategy Project?

This project will create a strategy that will guide the development of the food system at the University of Manitoba. "Food system" means the places, people, groups and facilities that produce, consume and dispose of food, plus the various programs and processes that make up our food culture.

The project is being undertaken to help ensure that healthy, desirable food choices are available at the university, to reduce the negative social, environmental and economic impacts of the food system, and to support the institution's strategic priorities (including being an outstanding place to learn and work, contributing to local and global wellbeing, and academic enhancement in a number of food-related areas).

The project has three phases:

1. Building a baseline – Information has been gathered about current status and trends (2014)

2. Visioning and dialogue – an open community conversation was completed about direction, smaller conversation with stakeholders about their priorities (2015)

3. Strategy development – write a strategy that has shared ownership and check back with stakeholders and the community to ensure it reflects what was said (2015 and beyond)

This strategy will be the first of its kind at U of M. Many other universities and colleges have food strategies. The Office of Sustainability is leading the project, with active participation from many others, including UM Food Services and the Campus Food Strategy Group (a student-led healthy and sustainable food group). Community input is a priority.

Why do we need a food system baseline?

In order to understand what is working and where there is an opportunity for change, we need to have an objective understanding of what is happening in our food system. This helps avoid speculation, snap judgment and unrealistic expectations.

The food system is very complex, and understanding why something happens or doesn't happen in one part of the system requires looking at other parts of the system. For example, a food service operator may not use compostable cutlery for take out because there is no composting facility in the area, which may in turn be a result of government regulations or market signals. A baseline will help us see where barriers and opportunities are.

A baseline will serve as a reference point that can help us track the impact of any changes, or natural changes to the system over time.

How will the baseline data be used?

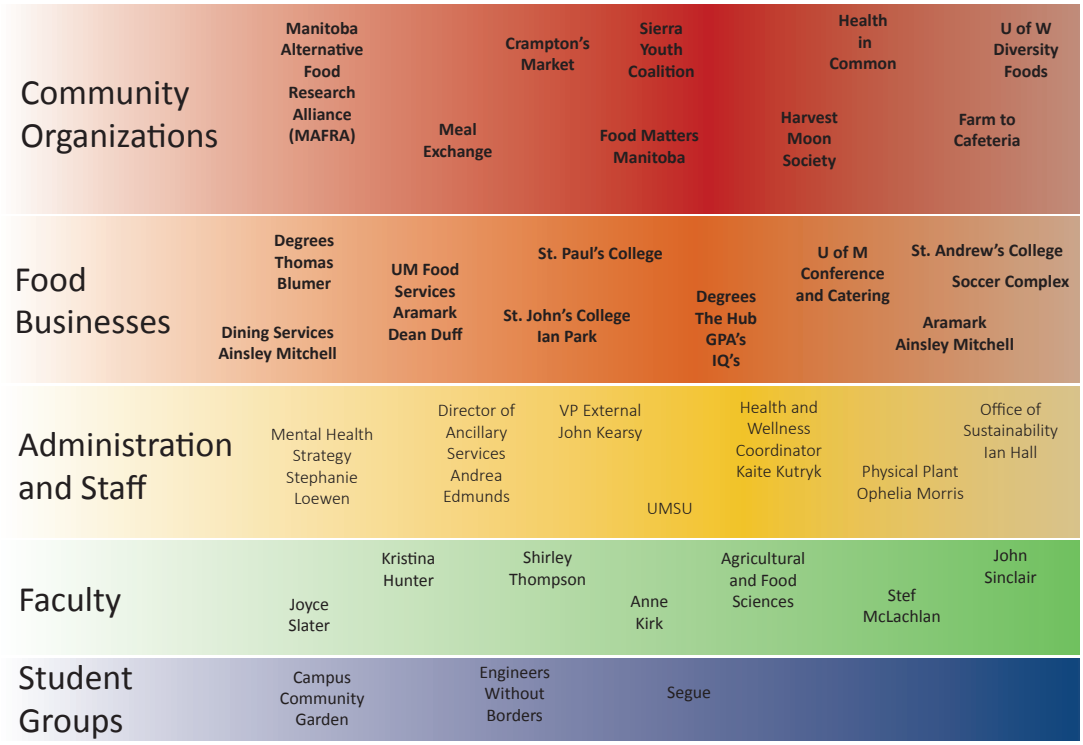
- To compare our food system with the larger community food system and with other institutions; differences may point us to opportunities.
- To begin a conversation about future directions, and to map the impacts of those directions.
- To promote unique or successful features of our food system to understand how to grow success.
- And with extreme sensitivity to the complexity of the food system, the fact that many people earn their living from the system, and that any talk of future changes will affect some stakeholders much more than others.

Methodologies and Process used to Create the Food System Assessment

Methodologies/process	Timeline
Literature review of university specific campus food strategies was conducted	January 2014
Online scan of existing food system indicators used in community food assessments and community food planning initiatives	January 2014
Draft list of indicators were developed to increase understanding of the University of Manitoba food system	January 2014
Draft list of indicators were circulated to food system experts at the University of Manitoba, province of Manitoba and to National organizations for feedback	January 2014
Individuals who would be impacted by the food system baseline assessment were identified and a memo was circulated with information about the Campus Food Strategy.	January 2014
Questions for individual interviews were developed based on the 46 indicators	February - March 2014
Requests for information were completed via emails and one-on-one interviews (refer to table # for list of consultations).	February - March 2014
Online searches for information were conducted using the University of Manitoba website.	March - May 2014
Transcriptions of the interview data were completed and data was reviewed and organized according to the 46 baseline indicators.	May - June 2014
Food venue menus reviewed and data was organized based on the indicators.	June 2014
Report for the Food System baseline assessment compiled.	February 2015

University of Manitoba Campus Food Strategy Group

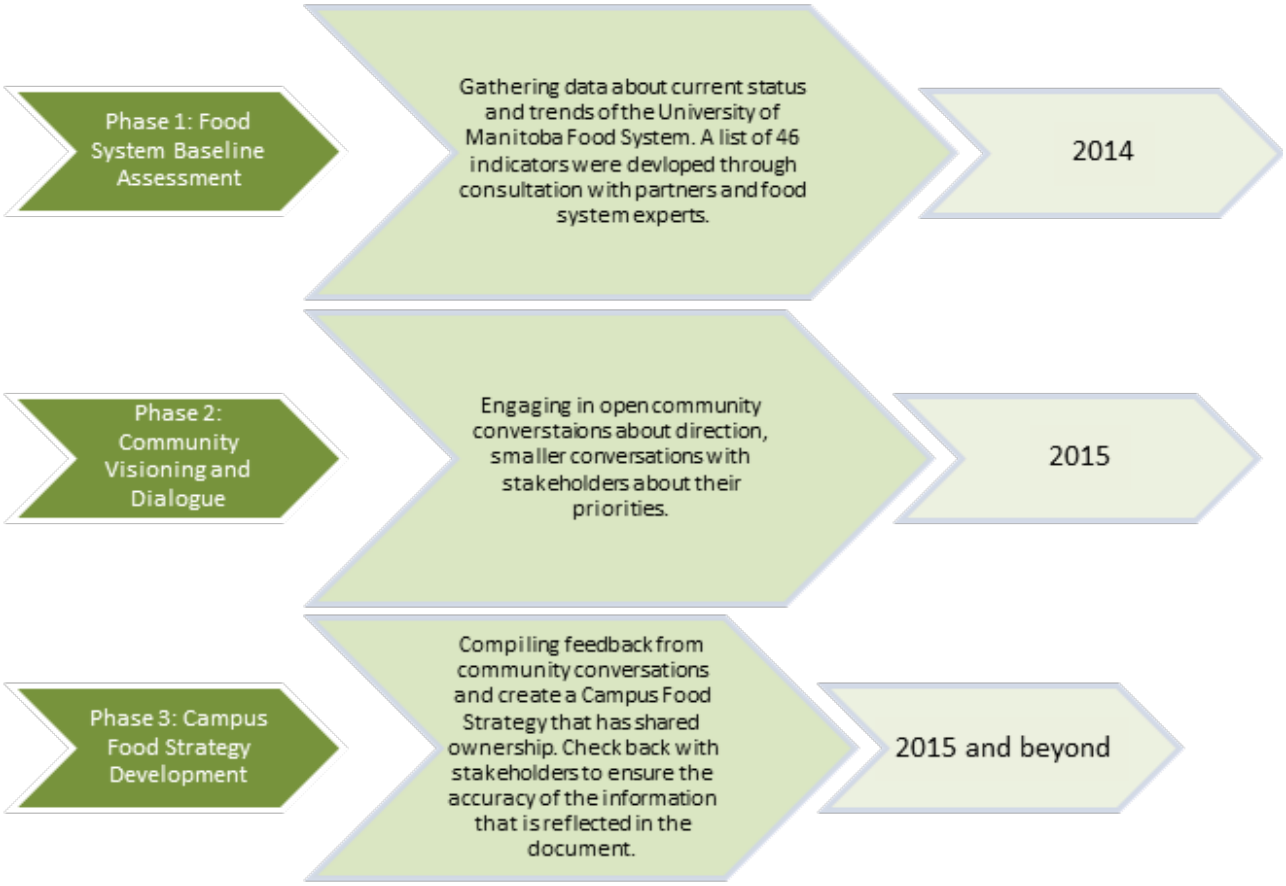
Some of the foundational work of identifying key stakeholders was completed by a student-led initiative called the Campus Food Strategy Group (CFSG). The University of Manitoba was selected in 2012 from a group of forty-two Canadian campuses to participate in the Campus Food Systems Project, a pilot project funded by Meal Exchange and Sierra Youth Coalition. Nine campuses were selected for the two-year program. The main goal of the project was to support sustainable food systems through student leadership on campuses across campuses.
(Project website: studentfood.ca) A healthy, connected and responsive food system on campus is essential to the student experience and campus culture at the University of Manitoba. One of the first tasks of this group was to identify different stakeholders involved in the food system at the University of Manitoba. Those involved currently can be seen in the figure below.



Working Toward a Campus Food Strategy

The food system baseline assessment is phase one of the development of a Campus Food Strategy. The baseline assessment provides a foundation of knowledge that can support community action to create changes towards a healthy and sustainable campus food system. A Campus Food Strategy would support the strategic priorities of the University of Manitoba of being an outstanding place to learn and work, while contributing to local and global wellbeing and academic enhancement in a number of food-related areas.

A high-level vision for a sustainable food system is included in the University of Manitoba "Sustainability Vision for Action" document. In this visionary document, created through community dialogue, the food system is seen as part of community livability and self-sufficiency and an opportunity for ecological regeneration. The document includes a variety of strategies for improving food connections and creating new choices that could enhance the positive impacts associated with our local food system.



Food in Sustainability at the University of Manitoba: A Strategic Vision for Action

The University's sustainability vision document includes a section that addresses food:

Vision:

- Provide nutritious, safe and culturally diverse food of good value to the campus community and incrementally improve the sustainability of ingredients.

Benefits to the University:

- Support for local farmers and producers in Manitoba.
- Continue to provide nutritious food on campus, to encourage and maintain student and staff health.
- Contributes to ethical investments internationally through fair trade options.
- Opportunities for links to research in sustainable agriculture, food security and food sovereignty issues.

Goals:

- Educate campus community members on sustainable food options.
- Increase culturally diverse, sustainable, and fair-trade food offerings from University of Manitoba Food vendors
- Increase accessibility to fresh, clean, free drinking water on campus.

Related goals:

- Develop the campus as a more self-sufficient and livable community.
- Implement an ecologically sustainable landscape and forest management strategy.

Source: Sustainability at the University of Manitoba: A Strategic Vision for Action (pages 29 & 30, 38)

SEE THE POSSIBILITIES

University of British Columbia Food Systems Project

The University of British Columbia (UBC) has taken strides in creating a uniquely sustainable campus since the early 2000's by not only being innovative in waste and water management, climate change and green buildings but by also using the campus food system as a living lab. The University of British Columbia (UBC) uses a collaborative, cross-campus initiative that brings together partners in academics, operations, and research to further advance the campuses food sustainability initiatives and food systems (UBC Sustainability - Food, 2014). Nestled on the campus are a number of onsite gardens which provide fresh produce to students and food services, but also provide the nearby community with seasonal choices. UBC has established a number of in-vessel composting systems throughout the campus. The entire campus also participates and encourages the usage of the Eco-to-go containers which is facilitated through a minimal membership fee.

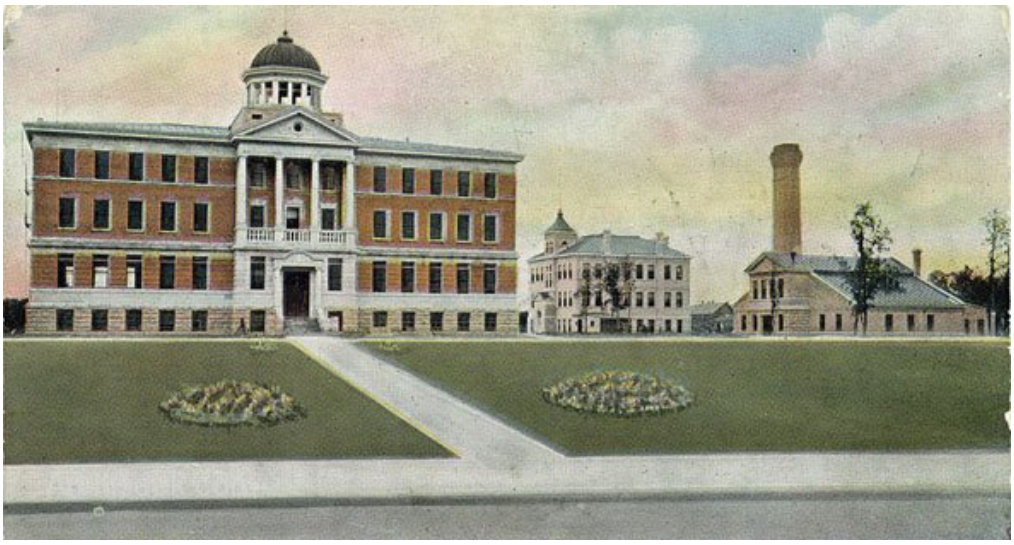
UBC Food Services is helping meet the university's larger sustainability mandate by taking leadership in various initiatives to lighten the ecological impact of operations and providing interdisciplinary learning opportunities for students. There are opportunities within specific degrees, coursework and as well getting involved with the gardens, farmers' markets or cafes that all contribute to the overall goal of sustainability. UBC Food Services has worked with over 900 students on projects. Students have written over 60 papers addressing aspects of the food system, and have made recommendations as to how UBC can become a leader in food sustainability, many of which have been implemented into operations. UBC is an example of how campuses can quickly emerge as food systems leaders and gain significant returns of the work they have been doing.

2. PRODUCTION & PROCESSING

The University of Manitoba is located in the heart of agricultural prairie lands which enables us to have a unique relationship with food. Food production, processing and education are an integral part of teaching and research at the University of Manitoba. As an example of evidence to support this finding, the baseline reveals that we currently have the capability to create a tasty breakfast including eggs, milk, vegetables, herbs, sausages, and bacon from ingredients that were grown and processed at the University through our education and research programs. This is the result of a variety of production and processing capacities:

- At the Fort Garry campus there are community garden spaces and research plots as well as a variety of indoor production spaces and processing facilities
- Two research campuses where production and processing take place are located outside of Winnipeg: Glenlea Research Station/Farm and Ian N. Morrison Field Research Farm.
- The Bannatyne campus is home to a Medicine Wheel Garden with traditional indigenous medicines
- The William Norrie Centre has a small courtyard garden

This part of the baseline highlights current research projects, campus and community programs and production and processing-related learning opportunities. An inventory of current products being grown and processed is also included. Understanding the current capacities of the University can support dialogue about opportunities to broaden or increase the range of production and processing that is available.



1906 Architecture sketch of Agricultural Building at University of Manitoba designed by Samuel Hooper Photo credit: Archiseek.com

Context

The structure of Canadian agriculture has changed significantly over the last two decades. Fewer but larger farms are operating, and less than 1% of Canadians are farm operators (Government of Canada, 2014) Over the same period, the average age of farm operators increased, rising from 47.5 to 54.0 years (Government of Canada, 2014).

In Manitoba, food production and processing are a vital part of the economy and the livelihood of the population. Seventy percent (70%) of food produced and processed is exported, and 1 in 11 jobs are related to the agriculture industry. Food production and processing also play a role in shaping the rural landscape of the province and subsequently influences research initiatives at the University of Manitoba. Manitoba produces more than 2.6 million tonnes of food annually (Province of Manitoba). The main agricultural commodities include canola, hogs, wheat, cattle, dairy products, poultry, eggs, barley and flaxseed. Food processing in Manitoba represents nearly 25% of the total manufacturing output and annually produces $4.0B of food. Meat and poultry slaughtering and processing represent the largest segment of Manitoba's food processing industry.

Producing local food and having it readily accessible has many great benefits for everyone involved including understanding where the products came from. Being able to have open lines of communication between farmers, producers, food services and end users/consumers is beneficial for each level. Accountability is established, there is transparency and traceability creating a stronger connection to place that can yield better system-level outcomes.

Education and Research

The University of Manitoba has a rich agricultural history. An excerpt from the FAFS states that,

"The Faculty had its beginnings in Winnipeg in 1906 with the formation of the Manitoba Agricultural College, located on the south bank of the Assiniboine River (today's Tuxedo area of Winnipeg). In 1913, the Manitoba Agricultural College moved to the site of the Fort Garry campus which later became the University of Manitoba. In 1924, the administration of the Manitoba Agricultural College, now the Faculty of Agriculture and Home Economics, was transferred to the University of Manitoba." (University of Manitoba, 2015)

The faculty has four main research areas that emphasize sustainable and multidisciplinary approaches. These include safe and healthy food, sustainable crop and livestock production systems, healthy bioproducts and watershed management.

There are two faculties that house research facilities, centers and courses; the Faculty of Agricultural and Food Sciences, and the Faculty of Science. In total there are nine departments, 87 researchers, 18 research facilities and centers (see Appendix 2), over 150 courses and 1,178 students enrolled in studies related to food production and processing (See Appendix 3). As well, Extended Education offers programs in horticulture and beekeeping.

Located about 15km south of Winnipeg on Highway 75, the Glenlea Research Station is the primary animal agriculture research facility of the Faculty of Agricultural and Food Sciences. The facility is used extensively by faculty and students in the Department of Animal Science for research and hands-on training with the pig and dairy cattle herds on site. There are also approximately 1,200 acres of pasture and cropland for Animal Science, Plant Science, Soil Science and Entomology research. The Station's facilities and services provide space and infrastructure for teaching, research and outreach programs and are connected with the National Centre for Livestock and the Environment (NCLE), and the Bruce D. Campbell Farm and Food Discovery Centre.

NCLE activitiies centre around sustaianble agriculture production systems. Researchers combine therir diverse expertise to study farm productivity and viability, environmental stewardship, food quality and safety, and efficient energy and water use. An example research project, initiated in 2003 and involving multiple levels of government and industry specialists, looking at the impact of hog manure on the productivity and sustainability on forage fields is described below.

Pasture Partnership Proves Productive

It sounds simple – apply hog manure to pasture and hayland and see what happens. It becomes a lot more complex when you involve several researchers with different backgrounds, a number of commodity groups, a few agencies with extension interests, and some farmers. For our research, it has been a very productive experience.

In 2003, we launched the Faculty's first, large-scale, multidisciplinary research study on a 160-acre parcel of forage land at La Broquerie. Since then it has become a model for developing a strong community of interest in research that addresses production, environmental, and socio-economic issues. Through this research, linkages were created among researchers from our departments of Agribusiness & Agricultural Economics, Plant Science, Food Science, Animal Science and Soil Science, as well as the University of Saskatchewan to ensure these trials provide as much useful information as possible. In addition, the project engaged many collaborators outside the university, including Manitoba Agriculture, Food and Rural Initiatives; Manitoba Water Stewardship, Agriculture and Agri-Food Canada's Agri-Environment Services Branch, several local equipment suppliers and the owners of the land and cattle company, Hytek Ltd.

The research project assesses the forage yield and animal production that results from applying manure as a fertilizer to pasture and hayland – the traditional thing done in agricultural research. Indeed, we did find improved production. There was about a three-fold increase in forage yield and grazing days per acre.

However, the research goes much deeper than yield gains. The ongoing research allows us to look closely at both environmental and food safety issues. The accumulation and movement of nutrients, such as nitrogen and phosphorus, in the soil are being tracked over a number of years.

Greenhouse gas release is also being studied to determine whether the timing of manure application, spring, fall or both, affects how much greenhouse gas is released.

Similarly, extensive work has been done to determine what conditions affect pathogens and whether they move from manure to forage to grazing cattle and/or to soil and water. The testing found that there was no transfer of salmonella or E. coli to the cattle or the soil when hog manure was surface-applied according to provincial guidelines with 30 to 60 days left between application and grazing or harvesting,

The project has also been designed with extension in mind – to share the information as widely as possible as it is gathered. Tours of the site are conducted regularly for farmers, extension people and the industry. The project also offers graduate students the opportunity to pursue research while rubbing shoulders with a large community that shares similar interests.

For more information go to http://www.umanitoba.ca/afs/labroquerie/

The Bruce D. Campbell Farm and Food Discovery Centre is the first hands-on facility which explores the methods in which food is made in Canada. Visitors learn about every aspect of food production from farming practices to retail sales. The Discovery Centre hosts workshops on canning and horticulture and are open to the public.

Ian N. Morrison Field Research Farm is a 406 acre facility located near Carman, Manitoba and is operated by the Department of Plant Science, Faculty of Agricultural and Food Sciences. A variety of grains, pulses, oilseeds, forages and special crops are grown for research and excess rotational crops are sold to a grain elevator. The research station Carman & Region Facility houses a wet lab, a seed lab, computer facilities and classrooms for teaching.

Manitoba Agriculture, Food and Rural Development's Crop Knowledge Centre, The Manitoba Pulse and Soybean Growers, The Manitoba Corn Growers, and The Manitoba Wheat and Barley Growers Associations are located at Carman Manitoba, and provide opportunities for collaboration between University faculty, provincial specialists, and the industry. Research conducted is being done by University of Manitoba faculty, technical support staff, and graduate and undergraduate students in collaboration with grower groups, industry, farmers, federal and provincial specialists and researchers.

Delve Deeper

Natural Systems Agriculture (including Canada's longest running organic field study now in year 24)
http://umanitoba.ca/outreach/naturalagriculture\

Sustainable Agriculture Systems
http://ncle.ca

Bruce D. Campbell Farm and Food Discovery Centre
http://umanitoba.ca/afs/discoverycentre/

Participatory Plant Breeding Research Project
www.seedsecurity.ca/en/126-participatory-plant-breeding-project

Green Paper – Moving toward Prairie Agriculture 2015
http://umanitoba.ca/faculties/afs/ncle/publications/AIA_Authors.html

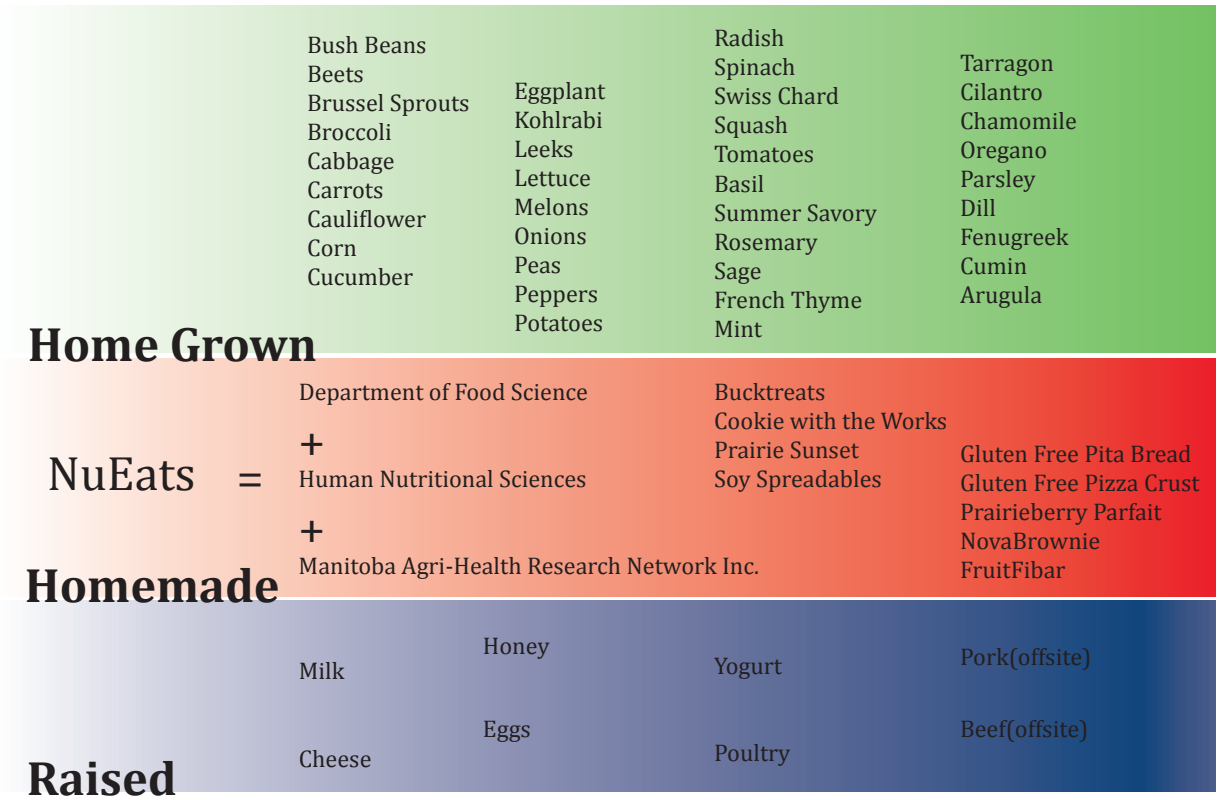
Food Production

The University of Manitoba has ten food production sites:

- At the Fort Garry campus there are six food production sites (described below) as well as an estimated ten fruiting trees (See Appendix 4).
- Two large research facilities are located outside of Winnipeg

  (Glenlea Research Station and Ian N. Morrison Research Farm)
- A medicine wheel garden at Bannatyne Campus
- A courtyard garden at the William Norrie Centre

Varieties of Foods Grown on Campus, Processed and Raised



The UMSU Community Garden: Chancellor Matheson Boulevard & University Centre Roof Deck

The UMSU Community Garden is the largest garden at the Fort Garry campus that grows food specifically for consumption. The garden is supported by the University of Manitoba Students' Union and is managed by a garden coordinator. There are forty individual plots that can be rented out and one community garden plot that is run by students and community member volunteers. Degrees Diner purchases vegetables from the community garden (not from the personal plots) during the summer months and incorporates them into feature menu items like soups, borscht and garden salads. The types of foods grown vary according to the individual plots. The amount of food grown annually at the community garden is not currently tracked. One of the benefits of gardening for volunteers is getting to share in the yield produced by the garden.

The UMSU Community Garden shares the land with the Rainbow Community Garden. The Rainbow Community Garden is a project of the Immigrant Integration Farming Co-operative that connects individuals who have recently immigrated with garden spaces to grow culturally-appropriate food that is not available to purchase locally. This partnership provides opportunities for cross cultural and inter generational learning experiences.

Two challenges faced by the Community Garden that prevent further expansion or increased yields are the lack of a consistent water supply and soil quality. Water is currently trucked by the University to the site (at no direct cost to gardeners) and then plots are watered manually. Soil is very heavy and wet which limits the ability to grow some crops.

In summer 2013 the UMSU Community Garden took on a new edible landscaping pilot project and, with support from University administration, used a handful of flower beds located on the University Centre roof deck to grow beans, peas, peppers and a variety of herbs. In 2014 the project was expanded to include edible landscaping in additional flower beds and interpretive signs were added.

A comprehensive practicum was completed through the faculty of City Planning, constructed by Aaron Short called, "Planning the Seeds of University Community Gardens", which focused on using campuses as living laboratories. The written work and research can be found in the Architecuture/Fine Arts Library.

Degrees Patio Planters:
Located on the third floor restaurant patio of University Centre

Most summers, planters filled with tomatoes, peppers and herbs are displayed on the Degrees Diner patio. The plants add beautiful greenery and the fruits, vegetables and herbs are used to create daily specials throughout the summer.

University of Manitoba
Medicine Wheel Garden of Indigenous Learning

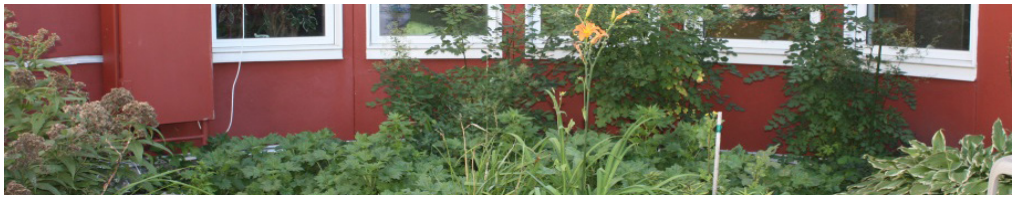
The Bannatyne campus is home to the newly opened Medicine Wheel Garden of Indigenous Learning, located in one of the older courtyards which was nestled between the Pedway Café, the Psychiatric Centre and the Basic Medical Sciences Building. Beyond being a production place for traditional medicines, the garden will provide a space for people to meet, share and learn about the importance and value of traditional Indigenous knowledge and medicines. Hyssop, mint, sweet grass and prairie sage are some of the sacred medicinal and ceremonial plants that are grown in the garden.

St. Andrew's College Garden

St. Andrew's College Garden takes a holistic approach to growing food. Their garden is used to add visual appeal to the landscape, produce tomatoes and herbs that are used in the residence kitchen and students can enjoy a fresh snack on the way to class or use the green space to relax and study.

William Norrie Centre Courtyard Garden

When the planning was occurring for the Inner City Social Work Program, the need was expressed for a green space when the building was being constructed. The final design included a courtyard that could be accessed easily for staff, students and clients. Roanna Hepburn and Maureen Fryza planned, planted, and hauled dirt for the perennial space on the south side. The north side was quickly converted from grass to a vegetable and flower garden by adding more quality soil. Inititally students planted tomatoes, cucumbers, and peppers for a few years before deciding in 2014 to give opportunities for staff and or students to adopt their own plot. As of summer 2014 the north side is primarily drought-tolerant plants and the south side showcases perennials. Ferns, hosta, lilies as well as herbs (including sage for smudging ceremonies) are grown. The gardens are a therapeutic spot for students or staff where both relaxation and cathartic weeding can be accomplished. In the winter months, the courtyard still provides visual relaxation as it faces the classroom wing hallway and can be enjoyed in any season.



The Point :
Fort Garry Campus – located East within bend of Red River

The Point comprises 100 acres of land used for research studies and is managed by the Department of Plant Science. There are agriculture students who use some of the land for garden space and grow a variety of food items for personal consumption, which is seen by the Faculty of Agricultural & Food Sciences as an important co-curricular learning opportunity. The Point is currently and primarily used for plant breeding, horticulture and plant research. The buildings located on the Point are used for crop handling, drying as well as seed storage. A gravel-surfaced road that circumnavigates the research plots is used as a walking path by the University community, offering an opportunity to connect with nature and with agriculture.

Greenhouses:
Agriculture Greenhouses

The Faculty of Agricultural and Food Sciences has 5,000 square feet of greenhouse space that is used for research and teaching. The greenhouse space is used to grow all of the flowers for University convocation. The UMSU Community Garden uses the facility to start their seedlings before transplanting them into the gardens.

Research Highlights

In conjunction with the Bauta Family Initiative in Canadian Seed Security, a select varietal of organic wheat is being grown for exclusive use of Degrees Restaurant on campus. The wheat itself is created for the specific needs of both the bakers and the client. Testing on baking methods with the wheat will commence in 2015.

Buller Greenhouse

The Department of Biological Sciences manages the Buller greenhouse which is used for research, teaching, and educational purposes. There are a limited number of food plants (tomatoes and herbs for example) that are grown specifically for plant giveaways to encourage people to learn about plants. In spring 2014 a plant giveaway event attracted nearly 200 people. The daycare on campus, Playcare, uses the facilities to plant seeds of food plants and flowers as an activity to introduce children to growing food.

Research highlights

One of nine rooms is devoted to research on canola, and food plants such as beans, peas, corn and tomatoes. The plants are grown for use in student laboratories on plant anatomy, physiology, taxonomy, diversity, medicinal plants and basic biology.

Insects and Animals: Beehives

Located at The Point, the bee facility infrastructure includes bee hives, a honey house and indoor wintering facility. During the summer, honey bees are also housed at the Glenlea research station or on cooperating farmers' fields. The number of bee colonies on campus varies and depends on the type of research projects being carried out, but can range from about 50 to 200 hives (150 in summer 2014). All colonies produce some honey but are not managed for that purpose except in years when the economics of honey production is being assessed in an experiment. Average production per colony in Manitoba is 73 kg and the Prairie Provinces produce about 75% of the honey in Canada.

Research highlights

Research at the University of Manitoba has shown that producers can dramatically increase colony survival over winter by selecting parasite tolerant stock adapted to local conditions and combining this with indoor wintering management systems. Marker assisted selection is being studied as a way to improve local stock and innovative approaches to controlling bee viruses using integrated pest management and double stranded RNA are showing promise.

Rob Currie at University of Manitoba Photo Credit: Winnipeg Sun

Poultry

The poultry research unit, adjacent to Smart Park, houses both laying and meat birds. Upwards of 4600 laying hens produce approximately 4,200 eggs on a daily basis. Broilers (meat birds) are brought in for research in groups of approximately 500 birds. Operated under supply management systems, all edible eggs and poultry meat produced in the poultry unit are shipped to and marketed by the provincial egg and chicken marketing boards.

Research highlights

Research in the poultry unit focuses mainly in the areas of nutrition, metabolism, bird health, immunology, and enriched housing systems for laying hens. Pioneers in working with enriched caging systems for laying hens, scientists in the departments of Animal Science and Human Nutritional Sciences continue to optimize the management of laying hens for health, performance and egg quality in these enriched systems

Example of housing for some poultry. Photo Credit: Globe and Mail

Glenlea Research Station

Cattle

The Ruminant Research Unit consists of the dairy barn as well as pens and pastures for both beef and dairy cattle. The dairy herd at the Glenlea Research Stations is made up of 60 lactating cows plus replacement heifers. The milk produced is sold through the Manitoba milk producers' marketing board. There is not a permanent beef herd at the research station. Beef cattle are brought in on a per project basis for research, and are commonly provided by a beef producer through an arrangement.

Research highlights

Research with dairy and beef cattle focuses on safe, healthy and environmentally and economically sustainable cattle production systems, including forage-based feeding systems for beef cattle, as well as dairy cow nutrition and gut health research. The creation of a balanced environment promotes healthier growth and nutrition for the cattle and the end product. The station provides ample opportunities for students to gain hands on experience with the animals and the research.

Pigs

The Swine Research Unit features two group-housing style barns, each with 130 sow farrow-to-finish capacity. One barn is based on the typical style of pigs housed on partially slatted concrete floors with a liquid/slurry manure system; the other is based on a solid manure system. Hogs for pork production are sold through the Manitoba hog producers' marketing board for processing at a federally inspected facility.

Research highlights

Swine research encompasses nutrition and nutrient use, alternatives to using antibiotics in the production of healthy pigs, environmental sustainability, reproduction, and the health, performance, behaviour and wellbeing of sows managed in group housing systems.

Animal Feed Processing Unit

Feed Mill – Glenlea Research Station/Farm

The feed processing unit consists of a pilot scale feedmill and feed processing equipment designed for formulating small batch research rations. All rations for the poultry unit as well as for small scale pig experiments are produced at the feedmill.

Research highlights

Research with rations formulated at this facility focuses on evaluating alternative and opportunity feedstuffs, including local ingredients, and on refining nutrient formulations for optimized animal health and performance with minimal environmental risk.

Al Neveux explains how feedstuffs and diets are prepared at the mill.

Sheep

Ian N. Morrison Research Farm, Carman, Manitoba

Sheep penning/fencing is available for research projects integrating sheep grazing in cropping systems. Sheep are brought in on a per project basis. Cross-faculty education and research is conducted through the Faculty of Agricultural and Food Sciences and the Department of Plant Science with sheep. Experiments conducted in 2009 examined the use of grazed green manures (cycled into legume crops) in pastures located in Carman, Manitoba. Using grazing livestock may provide a more balanced distribution of the nutrients and nitrogen in soils and restore nutrient cycling. Evaluations were completed on the types of crops, the nutrients delivered back into the soils as well as the yields of subsequent crops. The research completed was found to be extremely useful in finding the variety of green manure crops that goats and sheep would feed on as well as how intensive the grazing would be for terminating that crop instead of tilling.

Research highlights

Research with the Natural Systems Agriculture program studies sheep grazing of green manures in an organic cropping system as a means of replenishing soil nutrients and as a non-mechanical method for terminating crop growth.

Other Processing Facilities – Fort Garry Campus

The Food Science Department is located in both the Dairy Science and Ellis Buildings at the Fort Garry Campus and each contain a pilot (meaning small-scaled) food processing plant. The Department of Human Nutritional Sciences Human Ecology has a teaching laboratory (Barbara Burns Laboratory) where food is created and tested. NuEats (see below) has utilized this lab over the past few years to create innovative food products.

The first floor of the Ellis Building houses the Department of Food Science main research laboratories and classrooms for food chemistry, cereal chemistry, food proteins, food carbohydrates, food processing and food microbiology, meat and food processing including smoked meats, extrusion and canning.

The Dairy Science building is one of the original buildings at the University of Manitoba and houses a Dairy Processing Pilot Plant including pasteurization production rooms. At this federally registered and licensed pilot plant, local entrepreneurs are assisted in the start-up of dairy food manufacturing businesses. Clients and student volunteers are also trained in good manufacturing practices, food hygiene principles, and production procedures at this facility. Examples of courses provided at this facility include cheese making, ice cream production and pasteurization.

The Richardson Centre for Functional Foods and Nutraceuticals which is located in Smart Park at the University of Manitoba states, that it "is dedicated to the discussion, discovery, and development of functional foods and nutraceuticals, with a focus on the crops of the Canadian Prairies. Functional foods and enhanced foods recognized to have physiological and/or disease fighting benefits and nutraceuticals are control-dosage products derived from plants and dairy that have recognized health benefits. By identifying and enhancing health-promoting compounds found in prairie crops and using them to develop innovative functional foods and nutraceutical/natural health products, researchers at this world-class facility are producing foods today that will translate into improved health and wellness of Canadians tomorrow. The Centre is committed to the potential and growth of researchers, industry, academia, and producers and is dedicated to the support of these groups."(University of Manitoba, 2015)

The Canadian Centre for Agrifood Research in Health and Medicine researchs the potential health benefits found in foods, natural products and nutraceuticals. Their main research goal is to create postive and healthy results that translate into food and health products that will directly affect the public. They tend to target products that will aid in the reduction of immune disorders, diabetes, obesity and cardiovascular diseases.

Weston Sensory Research Centre

The Weston Sensory Research Centre, housed in the Human Ecology Building, works with clients to answer questions regarding the sensory attributes of food products that can arise for a number of reasons including changes in processing parameters, ingredients and storage conditions. There are a number of sensory test methods and complementary chemical and physical tests that can be selected to satisfy specific project objectives.

Research highlights

NuEats Food Innovation is a student-led initiative that was developed in 2011 and is a partnership between the Department of Food Sciences, Department of Human Nutritional Sciences and the Manitoba Agri-Health Research Network Inc. http://nueats.ca/

The group develops and produces specialty food products and is interested in testing out the market to better understand how specialty products can be sold. Examples of specialty products include; cheese, yogurt, ice cream, buckwheat kernels, beta-glucan fruit bars, soy spreadables and gluten free pita breads and pizza crusts. Some of these products are available on occasion through University of Manitoba Dining Services.

Photo credit: http://umanitoba.ca/faculties/afs/food_science/

Analysis

The University of Manitoba produces and processes a large amount of food at the Fort Garry campus and at research stations outside the city. Bannatyne Campus and William Norrie Centre have built a relationship with growing food and have connected it to their work and research. However, the food and food products being produced on Campus may not be as integrated into the local University of Manitoba food services as they could be. For some products produced exclusively for research, including them into the food system as part of food services may not be appropriate, though this is not the case for all food research products (see Appendix 5). Many of these food products enter general agricultural market streams, which makes it difficult to calculate the exact production quantity and capacity at the University of Manitoba.

Interviews suggested that knowing how much is produced would help us to understand what and how much would be available to be purchased by food services, other food partners, staff and students. There are different ways in which food and food products produced at the University of Manitoba by students and staff could be used, some of these suggestions have been identified in the reflections section. Identifying methodologies to quantify production volumes would be a valuable next step. The University of Manitoba has multiple facilities which would be ideal for starting to process different products. (See Appendix 6). There may be opportunities to increase the amount of fresh produce available to food service operators at the campus – such as fresh dairy and eggs. Communication between different players in the food system including those involved in production, food services and procurement is a critical requirement for food products on campus to stay on campus and be consumed by our community.

The benefits to exploring these opportunities further include reducing transportation costs and environmental impacts, supporting the local economy, increasing ownership of the University of Manitoba food system, and creating opportunities for faculty and students to continue innovating. As climate change, food safety concerns and declining natural resources make large-scale industrial agriculture increasingly unsustainable, smaller, more nimble and often experimental operations (precisely the kind of farms found on university campuses) have become even more important (Sayre, 2011). By understanding how our food system is connected, what we are producing, processing, how much, and what we consume, we are well on our way to figuring out how to incorporate more University of Manitoba grown and produced food within our food services.

SEE THE POSSIBILITIES

McGill University, Campus-integrated food production

Over the past three years, the horticultural research station on McGill's Macdonald Campus has been transformed into a market garden, and is now supplying more than 40,000 kilograms of produce to the University's Food and Dining Services annually (McGill Reporter Staff, 2013). McGill's Macdonald Campus Farm supplies the apples, melons, peppers, eggplants, tomatoes, artichokes that are used in residences and dining halls across the downtown and Macdonald campuses. The project was developed when people at Macdonald campus started asking themselves how the research farm could be used for more than just teaching. In the process of looking for answers to this question, students have gained experience in working in commercial-scale agricultural production, as well as in sales and marketing, and have also generated more than 80 new projects geared toward creating a sustainable future. These range from rain-water collecting experiments to research into how to extend the growing season, to a large-scale leaf-composting program designed to reduce the need for fertilizer on farm fields.

Guelph Centre for Urban Organic Farming

Located within the grounds of Guelph University on a one hectare parcel of land, the Centre for Urban Organic Farming provides integrated hands on course work for students and also provides education to the community, all while filling the baskets of eager market-goers seasonally. Using heritage seeds, the students promote educational opportunities to local groups, school children and the community. The group fundraises throughout the year with soup sales (made with vegetables from the garden), harvest dinners and selling produce during market times. The students learn how to operate a farm of any size with hands-on labour, and are involved in every step of the process from seeding to harvest. The Centre is home to Garden2Table, a program that was introduced to teach children as young as four about food production. Interactive learning including watching plants grow, transplanting, watering and understanding the local residents that live in a garden is part of the experience.

https://www.uoguelph.ca/gcuof/

Loyola City Farm

Established to create connections within urban agriculture, businesses, educational facilities and the University itself, the Loyola City Farm has expanded greatly in the past few years. The main garden at Loyola consists of four different sections:

- The first section is a collection of experimental plots designed for interns to explore different growing styles which could be suitable for urban, sub-urban or peri-urban gardens.
- The second section consists of produce primarily used within the campus or to be sold into the market.
- The third consists of herbs which are harvested and dried onsite and are used in teas at the Concordia Greenhouse Tea Atrium or for medicinal and culinary purposes.
- The fourth section explores permaculture with fruit bearing bushes, flowers and other herbs. These help contribute to the dynamic ecosytems of the garden and provide essential nutrients to the plantings nearby. The campus is also involved with four primary schools through the Schoolyard Gardens program which focuses on creating gardens for school aged children to learn, play and grow with.

  http://www.cityfarmschool.com/

University of Windsor Campus Community Garden Project

Based on the premise of building stronger connections with the University and the community by providing beautification, education and urban agriculture, the campus has helped in creating a sense of food security for the people of Windsor. The gardens are maintained by students, faculty and volunteers from the community. Promoting the image of biodiversity and sustainability is one of the main goals for the campus garden through maintaining a balanced ecosystem, collecting rainwater and planting native plants which attract pollinating insects. Over 10% of the produce collected from the individual plots is donated to the greater Windsor community in support of food security. Features include:

- The Keyhole Garden plot: is a dynamic, biodiverse garden with both native plants and vegetables that is focused on creating an aesthetically appealing scene.
- A plot for high-yielding crops that can be hilled up and planted in denser rows for maximum moisture retention and minimal weeding. 80% of the produce from these gardens is donated to the community to those in need and the remainder is shared between the gardeners themselves.

Reflections

- Ideas and suggestions heard by interviewers included:
- Map out how to use more of the food produced by the University of Manitoba in the food services on campus.
- Build a stronger partnership between NuEats and the food service providers on campus.
- Eggs produced on campus could also be processed on campus, but it would require a discussion with the Manitoba Egg Producers board regarding quota system.
- Explore the possibility of expanding the processing of cheese, yogurt, wheat and honey on campus and beginnning the processing of poultry
- Determine what type of available foods could be further processed and used.
- Examine the feasibility of increasing business operations of Glenlea Research Station/Farm to support the needs of food service providers on campus – ensuring economic, social and environmental sustainability.
- Interdisciplinary applied student research projects that address issues between the connectivity of the farm and the campus.
- Campus farm with Co-op – educational opportunities – location, students require a motivating factor – hands on work experience.
- Increase opportunities for edible landscaping and increasing the yield. Existing space on campus could be used which is presently irrigated or has access to water for increased growth.
- The Point has opportunities for edible landscaping along the arch boarding the 100 acres of research land.
- Plant orchards and diverse species of trees.
- Second floor patio University Centre.
- Increase space for edible landscaping – Greenhouse/garden spaces that incorporate seating areas and possible café spaces. Students are currently eating in greenhouses.
- Campus garden funding has been cut – new sources of funding needed.
- Build Partnerships.
- Meeting with the UM Dining Services culinary team to discuss opportunities for collaboration and featuring local food items and seasonal menu changes.
- Involve Department of Fine Arts and Faculty of Architecture.
- Urban Agriculture opportunities in the Visionary (Re)generation Project.
- Increase opportunities for knowledge exchanges and interactive activities for student engagement.
- Field trip opportunities for students to visit the Farm and Food Discovery Centre (FFDC).
- Specific food skills workshops catered to the needs and requests of students.
- Highlight where our students come from and what is produced and processed by the family farms.
- Expansions in line with future campus planning .
- Integrate gardens and orchards with new structural concepts and residents.
- Soil correction within the golf course to be able to support a network of orchards and gardens accessible to the University and residents of f campus.

3. PURCHASING: RETAIL FOOD SERVICES

The University of Manitoba community is made up of more than 35,000 people. Many of these people call the University home for much of the day, some of whom live in campus residences. All of these people eat, and many of them choose to purchase food from one of the six food service providers operating at the University's Fort Garry or Bannatyne campuses. Others will purchase commercially-prepared food off campus, or bring food they've purchased and prepared themselves at home. While it isn't possible to accurately measure the amount spent on food by our community, it is estimated to range into the tens of millions of dollars per year based on StatsCan data and locally reported figures (http://www.statcan.gc.ca/tables-tableaux/sum-som/l01/cst01/famil132a-eng.htm).

This section will provide an overview of food services at the University and their procurement practices, how much food purchased is local, sustainable, and or ethical, as well as identify real and perceived challenges to increasing procurement of local and sustainable food. Why devote an entire section to this one area? Purchasing choices are important because they influence the type of foods that are available to consumers. Purchashing options can have wide-ranging impacts on local, regional farmers and other food producers. Preferences for fair trade or cruelty-free can influence business behaviors along the entire (often very long) supply chain. In many communities, including Winnipeg, concerns over rising global food prices, the vulnerability of agricultural producers, and about negative environmental impacts from some farming practices have inspired widespread discussions about food supply chains, the resilience of food systems and the impact of food procurement. From a purchasing perspective, sustainability means considering more than just the cost and quality of the product. Responsible purchasing requires including social and environmental factors associated with a good or service as part of the decision making process. Through procurement, institutions like the University of Manitoba can play an integral role in supporting sustainable and resilient food systems. North American Universities and Colleges are collectively the 27th largest economy in the world (Local Food: Canadian schools, campuses and health care facilities speak up, 2013). They have the potential to provide stable markets for local food production and boost regional food economies - supporting the communities where they are based, reducing their environmental impact, and serving as a model for surrounding institutions and businesses.

Furthermore, in sustainability planning circles institutional procurement is considered one of the most powerful agents for driving change. Later sections of the paper will explore aspects of consumer preference and individual purchasing behavior and should be read in concert with this section.

It is critical to note that all of the retail food service purchasing decisions made at the University are constrained by a range of factors including the availability, quality, price and reliability of supply; as well as other factors such as personal choice, relationships, and awareness of options. Additionally, it should be noted that food service providers at the University of Manitoba operate independently from each other and in many cases from the University (to varying degrees). The experienced food service professionals at the University of Manitoba strive to offer high-quality, safe, nutritious, affordable food that meets the needs of the University community. Thus, the observations about purchasing trends in this part of the report should be read as an expression of many combined factors, including available supply, market demand and proven business practice.

Finally, a special acknowledgement is offered to all of the University of Manitoba food service managers. All participated enthusiastically in this research and shared their experiences, challenges and their interest in working together on a sustainable food system.

Context

There was a time when the majority of food was grown nearby and harvested when it was fresh and in season. The modern abundance of food choice and quantity is a result of the transformation in our agricultural system and the ability to transport food over long distances (Abrams, Lee, Jaffee, Foley, & Schawartz, 2012). The impacts of this transformation cannot be understated, as research continues to exploit social, environmental and economic changes that continue to unfold as our food system changes. It's beyond the scope of this report to explore the impacts of these in detail, but a few points to consider are:

- On average, food travels over 2,400km from farm to table which requires a large amount of fossil fuels (Rajkumar, 2010). Current studies estimate that transportation of food accounts for about 5% of global carbon dioxide emissions, while food packaging accounts for about 7% of global emissions (Harvard School of Public Health, 2012).

- Large scale producers and retailers, often foreign owned, control much of the food system. The agro-industrial production system can appear inscrutable and that system's focus on reliable, safe (for the end consumer), high-volume production (all good things) can be in conflict with producing food that provides optimal nutrition, flavour, experience of terroir (sense of place or expression of geographic character) and enjoyment.

- Buying local keeps money and profits in the community, creating what Time magazine referred to as a "local currency" (Schwartz, 2009). Maintaining a proper flow of money within a community means it will be circulated and provide benefits at an accelerated pace as compared to supporting an external entity.

- Life and livelihoods in the small rural communities that the world now "depends" on for certain products such as beans or sesame have changed dramatically. Many once grew food to support and feed the local community and exported the surplus, while importing products that could not be grown or were not easily accessible. Since globalization has transformed the food system the demand for export has increased so much that large scale producers (often supported by corporations) who can grow and export for less cost are favoured, leaving little produced for local/domestic consumption.

- Consumer preferences and habits have also changed. At an individual level we've benefited from the transformation of the food system in terms of access to fresh and processed foods from around the world, often available to us 365 days per year. Even one generation ago the idea of fresh fruit being widely available (and affordable) through the Canadian winter would have seemed miraculous.

For these reasons and others, some consumers (at the institutional and individual levels) look for alternatives to agro-industrially produced food. Popular documentaries, books and entertainment pieces – some rigorously researched, others purely sensational (or delivered as parodies, such as Portlandia, wherein a couple ordering a dish in a restaurant is provided with a biography of the chicken (Colin) being proposed for dinner) – have popularized the quest for a sustainable food system.

From the buyer's point of view, the challenge of defining a sustainable food system, or a sustainable food product is fraught with trade-offs (local versus organic) and challenges.

What an individual defines as *local* will differ depending on the context. In a large urban center, *local* may mean 300 miles (480km) as compared to smaller city or a rural town where *local* may mean 100 miles (160km) or even your neighbor across the road. The *100-mile diet* has been trending in the past number of years, but it is only feasible if people are geographically located where they have access to fresh local food year round (typically, eating locally produced products that are in season is the most effective way to reduce environmental impacts from food production). The growing season in Canada, especially in central Canada is too short to sustain a 100-mile diet, to a locavore (meaning 'local eater') whereas someone living in the Southern United States may have access to fresh local produce year round.

A short growing season in our geographic location does not preclude us from purchasing local foods, but doing so may require storage processes or preservation methods such as cold storage; canning vegetables, fruits and meats or other forms of preservation (drying, curing, fermentation, etc.). Production methods may change as well: solar greenhouse structures have been one of the most successful ways of producing crops during the winter months, and many of these structures can be found in Manitoba. A short article produced by Dr. Qiang Zhang, P. Eng about the research being conducted on solar greenhouses in Manitoba can be found at http://www.arch.umanitoba.ca/greenmap/pages/GM_MG_SolGrnHs/pages/1.html

Sustainable agriculture can be defined in many ways, but ultimately it seeks to sustain farmers, resources and communities by promoting farming practices and methods that are profitable (can sustain a livelihood), environmentally sound and good for communities (Horrigan, 2002). Organic agriculture is often considered sustainable agriculture. The organic food market is a rapidly growing sector of the global food industry. The global market for organic products reached a value of almost $63B USD in 2011. (Source: International Federation of Organic Agriculture Movements). Worldwide, about 37.2M hectares of agricultural land are certified according to organic standards, while 1.8M are certified organic producers.

In Canada, there has been a small but increasing organic agriculture sector since the early 1980s. In recent years, this sector has seen dramatic growth with organic food consumption developing at a faster rate than production which affects supply and demand (Government of Canada, 2013). Organic meat, poultry, eggs and dairy come from animals that are not fed antibiotics or growth hormones.

Community Supported Agriculture (CSA) has been a well-documented and supported alternative food system within Manitoba. Through 19 registered local CSA farms (both rural and urban) individuals and families can opt in to a farm share of locally grown sustainable produce during the growing season. Most of the farm shares include opportunities not only to purchase fresh produce but also eggs, milk, poultry, venison, pork and beef. Each of the farms that have signed up and are actively participating within the CSA do not use herbicides, pesticides and produce organic sustainable fares. Their goals are to make local foods more accessible and affordable than obtaining them from a grocery store where origins and quality may be unknown (Source: http://csamanitoba.org/).

Retail Food Services at the University of Manitoba

The University of Manitoba hosts a wide range of food services. Generally these are considered to be operated by six food service providers:

1. Aramark (called UM Dining Services on campus), which is a University-contracted food service provider. Aramark manages operations, and food service workers are University employees.
2. UMSU food services, which is operated by and for the benefit of students.
3. St. Andrew's College, which operates independently from the University and hosts a contracted food service partner.
4. St. John's College, which operates independently from the University and operates its own, in-house food services.
5. St. Paul's College, which operates independently from the University and hosts a contracted food service partner.
6. Edna Fedya, which is independently managed and is part of the Stella's café and bakery business.

Additionally, an independently-operated cafeteria operates in the Indoor Soccer Complex on Chancellor Matheson – this is excluded from analysis here as it primarily serves that facility. A complete list of food service operations is below.

Aramark also operates food services, including Tim Horton's, Grab n' Go Deli, Starbucks and Pita Pit at Bannatyne Campus.

Food Venues and Food Service Providers at the Fort Garry Campus

Food Venue	Food Service Provider	Type	Hours of Operation	Location	Information Accessed
Greenhouse Café	Aramark	Express Program Hearty Soup Coffe**eco**mpany Bene Pizzeria	Mon-Thurs 8AM- 6PM Fri 8AM - 5PM	Located in Dafoe tunnel - Arts Complex	umanitoba.campusdish.com Aramark in person visit
The Hard Chalk Café	Aramark	Express Program Hearty Soup Tmmy.Ymmy my Coffe**eco**mpany	Mon-Fri 8AM-3PM	Located in education building upper level	umanitoba.campusdish.com Aramark in person visit
The Young Associate's Café	Aramark	Express Program Hearty Soup Tmmy.Ymmy my Coffe**eco**mpany Bene Pizzeria Montague's Deli Pan Geo's	Mon-Thurs 8AM- 4PM Fri 8AM-2PM	Located in Drake Centre	umanitoba.campusdish.com Aramark in person visit
Dayside Café	Aramark	Express Program Hearty Soup Tmmy.Ymmy my Coffe**eco**mpany Bene Pizzeria Montague's Deli Induction Cooking	Mon-Thurs 8AM- 6PM Fri 8AM - 5PM	Located In University College	umanitoba.campusdish.com Aramark in person visit
University Centre - Campo Café	Aramark	Fresh Grill Healthy Kitchen Pizza Shawarma Wok Get the Good Stuff Subway	Mon-Thurs 10:30AM-6:30PM Fri 10:30AM-3PM *Not all locations are available during the hours of operation	University Centre- Main Floor	umanitoba.campusdish.com Aramark in person visit
Bistro Two O Five	Aramark	Restaurant and Takeout	Mon-Thurs 11:30AM - 2PM Fri 11:30AM-2PM (buffet)	University Centre - 2nd Floor	
GPA's	UMSU	Convenience Store	Mon-Thurs 8AM-9PM Fri 8AM-8PM Sat-Sun 11AM-4PM	University Centre- Main Floor	Online (UMSU website)
IQ's	UMSU	Coffee/tea Starbucks Baked Goods Pizza Bubble Tea Chips and snacks Sandwiches	Mon-Thurs 8AM-12AM Fri 8AM-2AM Sat 12PM-2AM Sun 12PM-12AM	University Centre - 3rd Floor	Online (UMSU website)
Degrees	UMSU	Restaurant and Takeout	Mon-Fri Rest 8AM - 8PM Mon-Fri After hours takeout 8PM -10PM Sat Rest 11AM - 7PM	University Centre - 3rd Floor	Online (UMSU website)
The Hub	UMSU	Restaurant and Takeout	Mon-Tues 11AM - 1AM Wed-Fri 11AM - 2AM Sat 8PM - 2AM Sun 5PM - 1AM	University Centre - 3rd Floor	Online (UMSU website)
Espresso 101	St. John's College	Coffee and Baked Goods	Mon-Fri 8AM-4PM	St. John's College	in person visit
Daily Bread Café`	St. John's College	Cafeteria and Takeout	Mon-Fri 8AM-10PM	St. John's College	in person visit
St. Andrew's Cafeteria and Catering	St. Andrew's College	Cafeteria and Takeout	Mon-Fri 7:30AM-6:15 Sat and Sun 11:30AM-6:15PM *closed between meals	St. Andrew's College	in person visit
Belltower Café	St. Pauls College	Cafeteria and Takeout	Mon-Fri 7AM-4PM Sat 7AM-3PM	Lower level of St. Paul's College	
Edya Fedya	Private Business	Restaurant and Takeout	Mon-Fri 7:30AM-3PM Sat and Sun 8:30AM-3PM	Smart Park in Monsanto Building	http://www.urbanspoon.com/r/332/1411593/restaurant/Fort-Garry/Edna-Fedya-Winnipeg
Cafeteria	Private Business	Snacks	When Facility is Open	Indoor Soccer Complex	
The Fresh Food Company	Aramark	Cafeteria	Mon-Fri 7AM-8PM Sat and Sun 11AM-8PM	Pembina Hall	Campusdish.com

Purchasing Policies

The University of Manitoba community does not currently have defined parameters or policies for sustainable, local or ethically sourced food products. However, all of the food services on campus support local, sustainable and/or ethical food procurement according to their own perspective, definition and direction.

The University of Manitoba has guidelines and policies put in place to ensure that procurement of products, food or contracts are negotiated and completed in a particular manner. In the 2009 Purchasing Policy set out by the governing body of the University, Section 2.4 mentions that the University will purchase "…goods/services based on the best value taking into consideration such criteria as price, total life-cycle cost, product or service quality, bid compliancy, supplier qualifications, experience and reputation". The purchasing policy does not mention aspects/qualities such as local, organic, fair trade, aboriginally owned enterprises, student enterprises, or community benefits (http://umanitoba.ca/admin/governance/governing_documents/financial/392.html). However work in this area is recommended by the Sustainability at the University of Manitoba: A Strategic Vision for Action (http://umanitoba.ca/campus/sustainability/media/Sustainability_at_the_University_of_Manitoba-A_Strategic_Vision_for_Action-June_2012.pdf) – see below.

Purchasing Goals in Sustainability at the University of Manitoba- A Strategic Vision for Action

Approved and endorsed by the President in May 2012, this document serves as a guide for promoting sustainability at the University in different areas including purchasing. The document progresses the idea of incorporating principles of sustainability in all procurement decisions. Seven goals were presented in this document:

1. Create a sustainable purchasing framework with appropriate standards for inclusion in the RFP and tender processes and for Purchase Order notes.
2. Research 3rd party certifications to identify those that fit the vision statement.
3. Implement the Supplier Relationship Management Program (ROSE initiative).
4. Increase number of sustainable products and services procured at the University while also emphasizing reduction of products as first priority.
5. Campus-wide acceptance and implementation of sustainable purchasing practices.
6. Explore the idea of purchasing consortiums with other large organizations.
7. Use life-cycle cost analysis for all acquisitions over a thousand dollar value and where appropriate in end of life discussions.

As well, purchasing at the University of Manitoba is guided by Sustainable Development Act Regulation 4/2004 (http://web2.gov.mb.ca/laws/regs/current/_pdf-regs.php?reg=4/2004) which, in section 2, compels the University as a publicly-funded organization to consider sustainable development when making procurement decisions.

This policy and regulation influence the University's contract with Aramark (called UM Dining Services) and for other food and beverages purchased directly by the University, such as coffee service and beverage vending. They have very limited influence on the specific decisions made by Aramark, and do not influence the buying decisions of College food service operators, UMSU food service operators, or the independently-run Edna Fedya restaurant. (See Appendices 7 and 8 for University of Manitoba purchasing policies and Appendix 9 for sustainable food measurements as stated by AASHE Stars 2.0).

Aramarks' policy on sustainable purchasing has described sustainability, "As a rapidly evolving field of study, Aramark defines 'sustainable food' in terms of the changing local priorities of the regions in which they operate; At UofM, the campus definition must be the primary guiding element in how and where the company applies the focus of its initiatives"

UMSU has an ethical purchasing policy that states:

When making decisions of whom to purchase from or what goods or services to purchase, UMSU shall prioritize:

1. Minimizing, and preferably avoiding, the purchase of goods or services that are socially, economically, or ecologically exploitative or destructive.
2. Local businesses, as a means of supporting the local economy and residents of Winnipeg and Manitoba.
3. Suppliers, goods and/or services that can best achieve the broader social-justice mandate of UMSU.
4. Organizations that are unionized or run as a worker cooperative.
5. Suppliers that are fair-trade certified by a legitimate 3rd party fair-trade labelling organization that is independent of industry.

UMSU also maintains a boycott list.

- Source: http://www.umsu.ca/sites/default/files/UMSU-Policy-Manual-2015-02.pdf
- All food service operators indicated that beyond the policies that some of them have, their purchasing is guided by building relationships with producers and suppliers (many of them local) whose approaches to safe, healthy, just and sustainable food align with their corporate and personal priorities.
- The Association for the Advancement of Sustainability in Higher Education (AASHE) has developed A Guide to Developing a Sustainable Food Purchasing Policy, and the AASHE Sustainability Tracking and Rating System outlines specific certifications for sustainable food and a definition of local (within 400km). Source: https://stars.aashe.org/pages/about/technical-manual.html

Current Food Purchasing Patterns

Much of the data about retail food purchasing patterns was generated by Manitoba on the Menu, a project funded by the Province of Manitoba and being led by Food Matters Manitoba. Food Matters Manitoba is a non-profit organization that focuses on engaging Manitobans toward healthy, fair and sustainable food for all and is leading two projects that are addressing local food procurement and localized food systems. Manitoba on the Menu is a two year pilot project with the primary goal of understanding and increasing institutional procurement of local and sustainable food in Manitoba. Food Matters Manitoba is tracking and identifying local food that is currently being purchased by institutions residing in Manitoba, while also identifying opportunities to increase the amount. Through the leadership of the Office of Sustainability, all six food service providers at the University of Manitoba signed a memorandum of understanding to participate in the project in 2014. For the pilot project, *local* has been defined as: **Manitoba Food -** Any food made entirely from ingredients sourced in Manitoba or composed of more than 85% of main ingredients from Manitoba. All the processing and packaging activities must be done in Manitoba. **Manitoba Made Food** - Any Food processeed and packaged entirely in Manitoba. When the main ingredients are available in sufficient quantities they must be used. This is the same definition as *Buy Manitoba*. Food Matters Manitoba is also leading the "Re visioning the Manitoba Harvest" project. The project connects Manitobans with the resources and skills they need to grow, share and eat local healthy foods. The goal of RVMH is to foster a localized food system that is strengthened and sustained by participation and cooperation from farmers and local food eaters (Food Matters Manitoba, 2014).

Per the project agreement, specific results from Manitoba on the Menu are treated as proprietary business information provided only to the participant being studied. On average, about 20% of the food purchased/available at the University of Manitoba is produced in Manitoba. As well, a comprehensive list of local producers and suppliers currently providing products to the University has been generated (see Analysis section that follows). Aggregated results show that food areas/items such as eggs, mushrooms, pasta, poultry and dairy are most likely to be local and fresh fruit/vegetables and other meats are likely to be imported.

Aramark's national head office is currently conducting a pilot project that is attempting to further identify what province specific food products are being grown and processed. They are partnering with their suppliers who are providing this additional information. The end goal is to produce a tracking system that will have detailed information about seasonality, location and quantities being purchased. This could provide a foundation to create seasonal menus based on what is available locally.

With the reopening of the University of Manitoba Campo food court in December 2014, some changes have been made with both food options as well as food procurement. Aramark as a company has realized the desire and demand on campuses for healthier food options. With the introduction of their "I go local" program, they have been providing up to 55% locally sustainable products to their food service programs (Aramark, 2014). Aramark's contract with the University extends to 2024 with a shared goal of increasing the amount of local and sustainable food products available on campus, taking into account seasonal availability of supply.

Food Purchasing Awareness and Advocacy – Fair Trade

In spite of the lack of an over-arching approach to local or sustainable food purchasing, student-led Fair Trade initiatives have been sustained over several years, and have seen significant change. Fair Trade certified products like coffee, tea and chocolate are sold on campus by three food service providers at a variety of food venues. UM Dining Services, St. John's College and UMSU food services serve Fair Trade certified and/or direct trade coffee, tea, and milk chocolate bars. The Engineers Without Borders student chapter has been advocating for increased awareness and access to Fair Trade products at the University of Manitoba, with support for Fair Trade producers, the Manitoba Council for International Cooperation and others. Since 2012 there has been an increase in the amount of Fair Trade coffee, tea and chocolate available for purchase on campus. In 2013, UM Dining Services transitioned its services to support Fair Trade by carrying a selection of three Fair Trade teas and exclusively serve Fair Trade coffee at their businesses and through their catering services.

Fair Trade products are becoming readily available and visible within community stores and even larger retailers. However many people who see the Fair Trade symbol do not fully understand what it encompasses. As supply and demand changes, many producers suffer from unfair trade relationships that place their living standards far below poverty lines. Not only does the producer suffer, but their family and surrounding community as well. Establishing Fair Trade agreements with producers is a system that utilizes well-sourced consumer information that is based within the markets to guide international trade to more ethical and socially responsible practices. Relationships are based on creating mutual benefits for the consumer, supplier and producer in both the short and long term. By participating in Fair Trade, it allows the producer to improve their communities and their overall standard of living by establishing stronger relationships through the supply chain. Other measures include ensuring a fair price for the products is agreed upon, creating direct trading links versus involving third or fourth parties, investing in health, education and infrastructure and above all, safe working conditions, respect and promoting environmental stewardship. As suppliers and consumers, there are a number of key factors involved when looking at the certification of Fair Trade products which include:

- Minimum price guarantees for the producers that cover the cost of sustainable production.
- Pre-harvest purchasing for buyers to ensure continued support.
- Premiums that support social, community and environmental development.
- Creating long-term relationships established on respect, trust and mutual benefits.
- Establishing relationships in communities with smaller farms, producers and

contracting companies to avoid price inflation.

- Safe and healthy work environments.
- Prohibition of child labor and respects local laws and traditions.
- Promoting environmental stewardship and rewarding initiatives such as carbon offsetting, organic farming, biodynamic practices and the protection of natural resources and ecosystems.
- Gender equality ensuring that women who work in production are valued and respected the same as their male counterparts.

Fair Trade Purchasing on Campus

Food Service Provider	Fair Trade Availability
Aramark	• Serves 100% Fair Trade coffee and a selection of teas throughout FT Coffee concept. This translates to over 3000 lbs of fair trade coffee being sourced and served at the University of Manitoba campus annually. • Fair Trade Cadbury milk chocolate bars in their vending machines. • Fair Trade coffee option available at Starbucks location in Bookstore.
UMSU	• Degrees Diner and The Hub serve Green Bean Coffee (direct trade and fairly traded, but not Fair Trade certified) and Fair Trade Numi Organic teas. • IQ's serves Starbucks Fair Trade certified coffee, Fair Trade certified Cadbury milk chocolate bars. • GPA's serves Seattle's Best Fair Trade coffee and Fair trade Cadbury milk chocolate bars
St John's College	• Serves Fair Trade certified, organic, shade grown and Canadian roasted coffee and has been for over 10 years.

Engineers Without Borders

"In EWB we try to spread the word about ethical consumption choices. To make sure we are making the connection between everyday decisions and poverty eradication. We are ensuring that our peers have the information they need to make decisions that lead to an equitable relationship between Canada and countries in mainly Africa but also around the world.

Fair Trade is a concept that brings education and awareness to consumers. It is a process that involves removing the unnecessary middle man from the supply chain and redirecting those funds back to the grower/producer as a proper payment or fair price for their product. With this fair price the producer is able to give their workers a fair wage, be more safe and environmental in their working conditions and not have to use things like child labour. By promoting fair trade we are helping people without directly providing them with funds, but rather a better way for them to provide for their family and community.

Our main goal currently in the Fair Trade Venture is working towards receiving a Fair Trade Campus Designation. This involves increasing the availability of fair trade products on campus as well as increasing the awareness and knowledge of students on campus. We will be having promotional tables with free fair trade coffee throughout the year to help with promotion as well as other events like movie nights, and a fair trade fashion show to help bring more knowledge and awareness." (EWB, 2014)

For more information:
http://www.umanitoba.ewb.ca/our_chapter/fairtrade.html

Analysis

The University of Manitoba food service community supports about 100 local farmers, producers and processors (see list below – source: Manitoba on the Menu research undertaken by Food Matters Manitoba, 2014). For a complete list of Farmers, processors and suppliers that are supported by University of Manitoba Food Services and Degrees Diner see Appendix 10.

The list in the next section is a list of all current Buy Manitoba participants. A similar list of local producers/processors is available at buymanitobafoods.ca/food. These participants were listed because they met the criteria set out by Food Matters Manitoba as having products or foods that are grown, produced or processed locally as well as being sustainable and or organic.

Examples of Manitoba Companies that Produce, Process or Grow Locally and Sustainably

Baked Goods

Bossevain Bakery
City Bread
Creative Pizza Crust
Cocobeans Bakeshop
D'italiano Bread
Double D's Cheesecake
Gunn's Bakery
Jeannies Bakery
Jonnies Sticky Buns
KUB bread
Linda's Country Kitchen
Lorenzo's Specialty Foods
Natural Bakery
Piccola Cucina Inc.
Sleepy Owl Bread
Tall Grass Prairie Bread

Chocolate/Candy

Chocolatier Constance Popp
Mordens' of Winnipeg

Gluten-Free

Bessie's Best
La Cocina Foods
Lorenzo's Specialty Foods
Pia's Variety Pesto
Rawnata
Wild Man Ricing

Honey/Spreads

Beemaid Honey
Beeproject Apiaries
Flora and Farmer
Giguere Honey Farm
Grammies Jams,
Jellies and Preserves
Oakman Enterprises
The Canadian Birch Company
The John Russell company
Wendell Estate Honey

Dairy/Eggs

Burnbrae eggs
Bothwell Cheese
Cornel Creme Ltd.
Countryside Farms
Dairyland
Nature's Farm
Notre Dame Creamery
Organic Meadow
Prairie West Ice Cream

Fruits/Vegetables

Brahman's Greens
Chinese Universal alfalfa sprouts
Fresh Option Organic Delivery
Greenland Greens
Lakeside Colony Ltd.
J. Berard Garden
Loveday Mushroom Farms Ltd.
Northern Asparagus Farms
Peak of the Market
Precision Produce

Prepared Foods

Boon Burgers
Danny's Wholehog BBQ
& Smokehouse
Del's Specialty Meats
Local Meats & Frozen Treats
Mr. Perogie
Naleway Foods
Tall Grass Prairie

Sauces/Condiments/Spices

Bessie's Best
Elman's Kosher Deli Foods
Greetalial Foods
Gourment Inspirations
John Russell Honey
Las Salsas
Nutrich Foods
Pia's Variety Pesto
Smak Dab

Vegan

Bessie's Best
Boon Burger
Jamore! Real Fruit Spread
Rawnata

Grains/Pulses

Adagio Acres
Best Cooking Pulses
Cavena Nuda 'rice of the prairies'
Derucky's Top of the Hill Farm
Flowing Grains
Manitoba Harvest Hemp Foods
Nature's Farm
Prairie Flour Mills Ltd.
Rede-Made Noodles
Shoal Lake Wild Rice
Stone Milled Specialty Grains
Wild Man Ricing

Meats/Fish/Butchers

All Natural Meats
Cold Country Pork
Country Meat Deli
Danny's Wholehog & BBQ House
Del's Specialty Meat
Dunn-rite chicken products
Ellice meats
Favour Rite Foods
Freshwater Fish
Granny's Poultry
Grindhouse Fine Foods
H.M.S. Foods
Independent Fish
Local Meats Frozen Treats
Mariner Neptune
Maple Leaf Foods
Northern Meat Service
Pioneer Meat
Prairie Abbatoir
The Carver's Knife
Winkler Meats
Winnipeg Old Country Sausage
Sunpeak/Multiwise Foods
Zinn Farms

Snacks

La Cocina Foods
Las Salsas
Mordens' of Winnipeg
Nature's Farm
Ronnie's Jumbo Seeds
Rawnata
Gorp Bar
Old Dutch (regular, ripple)

For an official listing and more information visit www.buymanitobafoods.ca

UM Dining Services defines *local* as within 75 km. In 2013, 17% of Aramark's food and beverage purchases at the Fort Garry campus were cumulatively local, community based and/or third party certified as sustainable.

Degrees Diner, a student run and operated business (UMSU) defines local as within Manitoba and purchases from more than ten local farmers, processors and/or suppliers.

Barriers to local food procurement were identified in interviews and involve both supply and demand related issues, some real and others perceived. Supply-side barriers include the limited seasonality of certain foods, reliability of supply (due to weather, scale of production and other variables), perceived liability/food safety concerns associated with buying from smaller producers, the lack of affordable food safety certification programs, and food safety policies restricting purchases to provincial and/or federal certification. For example, the UM Dining Services requires all of their fruits and vegetables to be provincially inspected and all meat purchased is required to be federally inspected – excluding many local products which do not have access (or affordable access) to these inspections. Demand-side barriers include reluctance to purchase local food due to perceived higher costs, student apathy or lack of awareness in purchasing local foods, existing contractual obligations and rebate practices, financial arrangements that prioritize increased profits in the short term and the inconvenience of working with multiple vendors. For example balancing the task of affordable food costs for students who request low prices and dealing with multiple vendors with varying prices was mentioned during interviews with food service providers at the Fort Garry campus.

Currently there are no policies or incentives for food service providers at the University of Manitoba to purchase local, sustainable and/or third party certified goods.

AASHE provides a valuable resource to begin the process of developing a sustainable food procurement policy. The fact that many food service providers are choosing to purchase local, sustainable and/or third party certified food is a qualitative indication of a demand on campus. However the issue is multi-faceted.

Not all buyers or suppliers have access to information on the origin of products (production and processing). As such, there is currently no tracking system that can identify specifically where certain products are coming from. In the past few years, Food Matters Manitoba has begun a movement within the province to source more local and sustainable growers and producers. Manitoba on the Menu, a pilot, had the goal of addressing the lack of connectivity between local farmers, producers, and supplies with institutions and finding ways to increase the opportunities, making it easier for institutions to purchase local and/or sustainable food. The pilot project being conducted by Aramark's Canadian head office will also help shed light on the situation.

Critical information is lacking on the demand side of purchasing research: the number of students that support an increase in the amount/type of local and sustainable food is not known. This could be a future area of research, perhaps supported by this report.

SEE THE POSSIBILITIES

Ryerson University

In the past year Ryerson University has been focused on creating healthier environments for work, play and living on campus. With a health and wellness webpage dedicated to student life there are opportunities for students, staff and community to explore what has been happening on campus regarding local food, diversity and sustainability. "Ryerson's latest commitment to environmental sustainability and sustainable foods, in hopes of using 25 per cent locally sources products," (Darcy, 2013) has spurred movements in various levels of food services on campus. Recently food services has introduced a $5 meal for students that are on the go and are searching for healthy and clean alternatives for food instead of greasy low nutritional foods. The options are conscious of allergies, dietary needs, as well as vegan, vegetarian, Halal and Kosher requirements. The menus change with the seasons and incorporate fresh and innovative meals which are sure to please any palate.

In the world of social media, YouTube videos and online blogs, a group of students at Ryerson decided to start making short and simple cooking videos for students. Many students often leave their parents' home and either live on campus or share dwellings with a number of other students, and cooking skills are often forgotten in favour of easy access food. These student's goals are to show that easy access food can be good for you, and easy to prepare while also being sourced locally and sustainably.

McGill University

McGill food services partnered with the McGill Food Systems project to develop sustainability standards which specifically define local foods. The standards include purchasing seasonal produce grown within a radius of approximately 500km, with the exception of citrus. All local food purchases must meet this criteria 75 percent or more of the time during summer, 50 percent or more in autumn and 25 percent or more in spring (McGill University, 2014). In order to address the issue of federal certification, the Macdonald Farm was granted Federal Certification for the sale of eggs, an initiative that was made possible in collaboration with the Office of Sustainability. Since November 7, 2012 all whole eggs intended for use in the five residential dining halls are sourced exclusively from the Macdonald Campus Farm. This has contributed to ensuring a viable campus economy by creating extra work for students from Animal Science, Agricultural and Environmental Sciences in the form of grading the eggs in-house.

Reflections

Ideas recorded during the research and interview process included:

- Create a working definition for local, sustainable and ethical food in Campus community at the University of Manitoba.
- Create opportunities for producers/suppliers and retail food buyers and chefs to meet and have low-pressure dialogue about opportunities and challenges.
- Examine current local food procurement, strategies and examine the possibility of introducing a sustainable food purchasing policy at the University of Manitoba.
- Further identify food products that are being produced at the University that could be introduced into food services and conduct a feasibility student and cost benefit analysis.
- Continue participating in the Manitoba on the Menu project.
- Examine opportunities for seasonal menu changes to enable greater utilization of local foods throughout the year. Increase awareness about the benefits of local, sustainable and/or ethical food through a coordinated marketing campaign that involves all food service providers.

4. FOOD ENVIRONMENT & EXPERIENCE

Understanding the food environment on campus and in the larger community is important to understanding how the current food system is meeting (or not) the needs of the Campus community. The University of Manitoba has a growing student population with diverse nutritional and dietary needs, and students require food as fuel for their academic and extra-curricular activities. In winter term 2014, there were a total of 28,402 students at the University of Manitoba. Undergraduate enrolment was 24,683, graduate enrolment was 3,669 students, and international student enrolment was 4,066 (Source: Office of Institutional Analysis).

The food environment plays an important role in influencing the availability of nutritious foods (Measuring the Food Environment in Canada , 2011). For the purposes of this report, the food environment is considered to be food venues where people can purchase food, places where people can acquire food such as garden spaces and food banks, food preparation spaces, and food workshops. In this section, health and wellness research, food availability, menu evaluation, food access, nutrition education and information, food preparation spaces, food skills and food events were explored. Examining home environments of students, staff and faculty were beyond the scope of this report, though they are acknowledged as important influences on what happens on campus and possible area of future research.

The subject of food environments is becoming increasingly popular among researchers and policy makers as is the importance of diet in supporting healthy communities. Assessing the food environment has become an important research tool in determining what is actually happening as it relates to diet-related outcomes, such as dietary behaviors, food purchasing, weight status, or diet related disease outcomes (Measuring the Food Environment in Canada , 2011). Research has shown that there are many determinants that affect food choice and include availability, cost, taste, culture, food skills, time, and income (Shepherd, 1999).

Food access is associated with food security and is defined as "a condition in which all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (World Health Organization, 2014).

Food Banks of Canada reported that there are more than 70 University and College food banks across the country. Student food bank usage is on the rise and is stated to be as a result of increasing tuition costs, youth job shortages and increased food prices (Gordon, 2011). Students put food at the bottom of the list when struggling to stretch their limited funds, and are among those who feel the pinch the most when food prices rise (Gordon 2011).

In general, food skills among the general population are decreasing (Slater, 2013). Many students attending post-secondary education are living on their own for the first time, and they have had to prepare food and cook meals for themselves – also for the first time. A large portion of students arrive without a basic foundation of food skills or grocery shopping knowledge. As such, students often rely on convenient and affordable food options that are often processed and easy to prepare. Some aren't aware of other accessible products on campus and in nearby markets and grocery stores. As mentioned previously, Ryerson University has a student-run health and wellness blog that provides content dedicated to supporting conscious and healthy decisions every day to promote a more balanced lifestyle on and off campus. Recipes, YouTube videos of simple and easy cooking demonstrations (put together by students), workout tips and relaxation suggestions are all part of the page.

Image: Volunteers at the UMSU Student Food Bank

Education and Research

The University of Manitoba community is actively involved in tackling some of the major issues related to food security, nutrition, community health and wellness. There are four departments, over 100 courses and over 70 faculty involved in research related to food, health and wellness (See Appendix 11). There are also a variety of research endeavors, volunteer opportunities, and service learning trips.

The University of Manitoba is home to three Canadian Research Chairs on the topics of food security and nutrition. Dr. Annette Desmarais holds Canada's Research Chair in Human Rights, Social Justice and Food Sovereignty. Her key areas of research are focused on food sovereignty, agrarian change, international development theory and practice, and rural social movements in Canada, Spain and Mexico. Dr. Peter Jones is the Chair in Nutrition and Functional Foods and his research focusing on lipid research and functional foods specifically examines the efficiencies of novel bioactive materials such as plant sterols. The third is Trust Beta, who holds a Chair in Food Processing for Grain Based Functional Foods.

Student Life offers service learning opportunities abroad as well as in the local community. Alternative Reading Week is a joint adventure between Student Life and UMSU that provides students the opportunity to volunteer with non-profits like Winnipeg Harvest, Big Brothers and Big Sisters and Siloam Mission. The experience has led to many students realizing their passions and interest in areas such as social work, law and public policy. Students can also travel abroad to Belize and gain experience in the area of food security working with a non-profit organization or travel within Manitoba to examine northern food security issues in Leaf Rapids (Source: http://umanitoba.ca/student/studentlife/servicelearning/)

Informal and Peer Education

University of Manitoba Campus Food Strategy Group

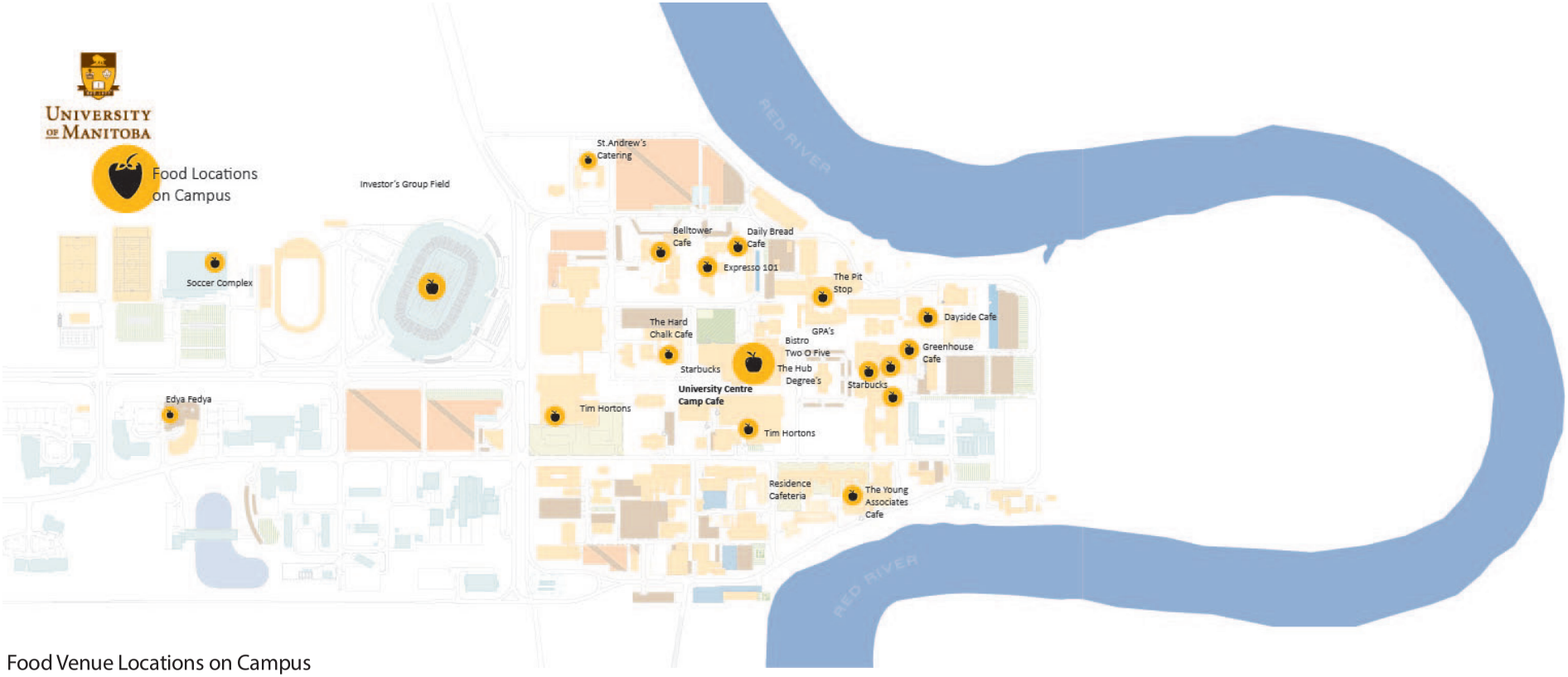
The University of Manitoba Campus Food Strategy Group (CFSG) is a student led group that has been working on campus since September 2012. The group is funded jointly through Meal Exchange, a non-profit organization located in Toronto and the Sierra Youth Coalition located in Ottawa. The CFSG supports the health and resilience of the University of Manitoba Campus food system by facilitating connections between key stakeholders, initiating discussions, distributing information and supporting events and programming.

Engineers Without Borders

Engineers Without Borders (EWB) Student Chapter advocates for increasing the amount of Fair Trade certified and ethically sourced products available at the University of Manitoba. They have held many successful events and campaigns at the Fort Garry Campus. As a result, EWB have encouraged food service providers to stock Fair Trade certified products like coffee, tea, chocolate and bananas

University of Manitoba Aboriginal Student Association

The Aboriginal Students Association (UMASA) is a student service group supported by UMSU. Every year, often in September, UMASA holds a traditional feast where foods like bannock, fish, wild rice and whale blubber can be enjoyed by all. The event is often held in University Centre at Fort Garry Campus where there are Aboriginal performances like traditional dancing, music and poetry. It is an opportunity to share the culture and teaching of Aboriginal peoples and learn about the history of the Fort Garry campus lands which are in Treaty 1 territory.



Food Venue Locations on Campus

Data

Food Retail

There are twenty-seven food venues located at the Fort Garry Campus and five at Bannatyne Campus (see list on page 50). There are six food service providers on campus. Based on compiled estimates, approximately $16M is spent annually on food on Campus.

Based on the Fort Garry Campus Food Service survey that was conducted in September 2013, approximately 40% of students, staff and faculty eat at least one meal a week with Campus Food Services. Based on the survey, University Centre Food venues were the most popular destination for lunch. The table below categorizes food venues based on when they are open during the regular academic fall and winter terms. During exam periods, and summer months (May – August), most of the food venues have reduced hours and a few food venues are closed. During the December holidays (two weeks), none of the food services are open, as the entire University of Manitoba is closed at that time. It was stated during our interviews that the December closures impact food availability for resident students, and in particular international students who remain on campus during this period of time. There is an ongoing dialogue between different stakeholders on the best way to address these issues to ensure the students' needs are being met.

Meal type availability at Fort Garry Campus

Type of Meal	# of food venues	Name of food venue(s)
Open for breakfast	14	Starbucks, Tim Horton's , Edna Fedya, Subway, GPA's, Bison's Grill, IQ's, Degrees, Daily Bread Café, The Belltower Café, St Andrews, Pembina Hall
Open for lunch (at least 11 – 3pm)	27	All food venues are open for lunch during the regular academic session, including Campo.
Open for dinner (at least 5:00pm – 10:00pm)	8	Degrees, The Hub, Daily Bread Café, The Belltower Café, St Andrews, Pembina Hall, Subway, Bison's Grill
Open for late night snacks – After 10:00pm	2	IQ's, GPA's, The Hub (during fall/winter terms)

Campus Food Services Survey 2013

In preparation for issuing a Fort Garry Campus Food Services request for proposal in July 2013, a food services survey was circulated by Ancillary Services to staff and students to collect feedback. Survey responses for select questions are captured in the word clouds below.

Responses Regarding Ways to Improve Food Services

Rank 1 (*1,575 responses*)

Responses Regarding Top Three Favorite Things About Food Services

Rank 1 (*1,341 responses*)

Menus were reviewed from twelve different food venues and analyzed based on five different dietary requirements. Menus were accessed online and reviewed to identify meals that met specific dietary requirements. For food venues that were not available online, site visits were made and meal items were recorded. In some food venues, meals are made to order and substitutions can be made (Degrees and The Hub). The majority of the food venues design meals with specific dietary requirements in mind. The results can be found in the table below.

Specific dietary requirement	Number of locations offering*	Food venue location*
Nutritious vegetarian options	12 out of 12	Degrees, The Hub, Pembina Hall, Bistro 205, Daily Bread Café, The Windtower Café, St Andrew's, GPA's, IQ's, Get the Good Stuff, Edya Fedya, Subway
Vegan options	4 out of 12	Degrees, Pembina Hall, Get the Good Stuff, Edya Fedya
Halal options	4 out of 12	Degrees, The Hub, Sultans, Pembina Hall,
Gluten free options	4 out of 12	Degrees, Pembina Hall, Get the Good Stuff, Edna Fedya
Culturally appropriate food options (based on UM international student country of original information)	5 out of 12	Degrees, The Hub, Pembina Hall, Daily Bread Café, Edna Fedya

*As of late 2014. Recent changes in Campo have added more options.

Vending Machines

In addition to the food venues, there are approximately 60 vending machines on Campus. In spring 2014 there was a vending machine request for proposals. Coke won the bid and will be in contract for services until 2021. The partnership includes the Fort Garry Campus, Bannatyne Campus, the University of Manitoba Students' Union, St. Paul's College, St. Andrews College and St. John's College. Differenet contracts are held for cold beverage and food vending. Types of food/beverage that can be purchased include, water, pop, juice, chips, chocolate bars, granola bars, and cookies.

In 2013, a group of students from the department of kinesiology initiated the Frank Kennedy healthy vending machine project and compiled a report with recommendations as part of a class project. The goal was intended to increase the types of nutritious foods found in the vending machines in close proximity to the gym. Since then, changes to the vending machines have been made and healthier snack options have been made available.

Surrounding campus food venue locations

In addition to the food venues located on campus, the overall food environment extends beyond Campus. Food venues were identified based on the knowledge that students are accessing food off-Campus at grocery stores, restaurants and fast food location, (refer to the table below).

The University of Manitoba is located 5.3km from the St Norbert Farmers' Market, the largest market in the province. The St. Norbert Farmers' Market operates from May to October and is home to over 35 vendors. There is no formal connection between the University and the St. Norbert Farmers' Market yet but there is a great deal of capacity to build a partnership.

Food venues surrounding the Fort Garry Campus (within 15 min radius of walking and/or bus – see note below)

TYPE	Number
Grocery stores	8
Farmers Markets	1
Restaurants	24
Fast food locations	12

Note: A radius was calculated based on average walking time and bus distance was calculated using the Winnipeg Transit website. The radius was then compared to addresses found on Walkscore.com. The University address that was used as the focal point was 66 Chancellor Drive.

Nutrition Education

"Nutrition is the intake of food, considered in relation to the body's dietary needs. Good nutrition – an adequate, well balanced diet combined with regular physical activity – is a cornerstone of good health. Poor nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduced productivity." (World Health Organization, 2014)

In a recent National College Health Assessment (NCHA) conducted at the University of Manitoba, fruit and vegetable consumption was collected from 561 Respondents with an overall response proportion of 31.2% (web based survey). The survey was emailed to random selection of students at the institution. Eating well with Canada's Food Guide recommends servings of fruits and vegetables for 19 – 50 years for females is seven to eight

servings, and for males it is between nine and ten. According to the results, none (zero) of the respondents are meeting their basic fruit and vegetable requirements, with 50% of the survey applicants consuming two or less daily servings. Assessing the application of national dietary guidelines was beyond the scope of this baseline assessment.

Food origin – mentioned in the previous section – should be noted again. Local produce has both nutritional and environmental advantages. Even when the highest post-harvest handling standards are met, food grown far away that spends a significant time on the road has more time to lose nutrients before reaching the marketplace. Greater crop diversity from the farmer results in greater nutritional diversity for the consumer and less water pollution and soil damage (Harvard School of Public Health, 2012). Local food procurement benefits the local economy, including supporting local farmers and other producers. It encourages sustainable agriculture and facilitates tracking the supply chain back to the point of origin to evaluate ecological practices.

Food Access

In order to meet the needs of the diverse student and staff population on campus there are a variety of student services, food workshops, events, and student groups at the University of Manitoba. There are six food related services including nutrition education, access, food production and food skills that are available. Additionally there are four student groups that provide supplementary support for students in the areas of food access, education and food skills. Refer to table on the following page for options of accessibility and education for students.

Food Accessibility and Services on Campus

Type of Meal	# of food venues	Name of food venue(s)
Open for breakfast	14	Starbucks, Tim Horton's , Edna Fedya, Subway, GPA's, Bison's Grill, IQ's, Degrees, Daily Bread Café, The Belltower Café, St Andrews, Pembina Hall
Open for lunch (at least 11 – 3pm)	27	All food venues are open for lunch during the regular academic session. Including Campo.
Open for dinner (at least 5:00pm – 10:00pm)	8	Degrees, The Hub, Daily Bread Café, The Belltower Café, St Andrews, Pembina Hall, Subway, Bison's Grill
Open for late night snacks – After 10:00pm	2	IQ's, GPA's, The Hub (during fall/winter terms)

Food Preparation

Many students, staff and faculty choose to bring food from home. Approximately 75% of the Campus population brings food from home, including meals and/or snacks (estimate based on data from the 2013 food services survey). Statistics Canada records show that 70% of food expenditure accounts for food purchased from a retail store, with the remaining 30% of purchases from restaurants. Some of the reasons for bringing food from home include: cost savings, specific dietary requirements or personal preference. The types of food brought to campus for meals are often dependent on how long a person will be staying and what kind of facilities they have access to including: storage, refrigeration, reheating and other final preparation steps. Food safety is a concern in food preparation spaces as there are often multiple people using the space and there are chances for cross contamination. During interviews it was mentioned that specific cleaning protocols and education about food safety standards do not readily exist and contribute to the challenge of keeping these types of spaces clean.

Many faculties have student and staff lounges that include a small food preparation area.

Image: Kitchen space in the Office of Sustainability (Fitzgerald Building)

These areas generally include a fridge, microwave, sink and table space. According to Health Canada, food preparation stations must be equipped with a hand washing station that includes soap as well. (Source: http://www.inspection.gc.ca/food/non-federally-registered/safe-food-production/guide/eng/1352824546303/1352824822033).

There are an estimated 68 food preparation stations located in faculty staff and student lounges, and university offices. While these preparation spaces provide space to refrigerate food, capacity is limited and many students do not have access. There were formerly three public microwaves located in University Centre on the first and third floors in GPA's and IQ's respectively. The microwaves located in University centre were well used and often had long lines during lunch time but were removed during renovations in 2014. There are still two remaining microwaves in IQ's, which are heavily utilized.

Student Residences

There are 1,320 resident students on campus with four student residences operated by student housing at the University of Manitoba; Author V. Mauro, Mary Speechly Hall, Pembina Hall and University College Residence. Overall there are 187 food preparation spaces in residences. Nine are full-size kitchens and 178 are kitchenettes.
Author V. Mauro is the only residence that houses individual kitchenettes in all of the 155 double occupancy rooms as well as one full size communal kitchen, and one private kitchen for the Resident Life Coordinator. Full-size kitchens have a stove, sink, full size fridge, microwave, countertops and cupboards. Kitchenettes have a mini-fridge or full-size fridge, microwave, and a sink.

Image: Arthur Mauro Student Residence Kitchenette
https://www.istest.cctest.umanitoba.ca/campus/housing/new_applicants/AVM.html

Mary Speechly Hall has two full-size kitchens (one of which is a communal kitchen) and eight kitchenettes located on every floor. Pembina Hall Residence has nine kitchenettes (one located on every floor), one full-size communal kitchen and one full-size private kitchen for the Resident Life Coordinator. University College Residence has six kitchenettes (one on each floor), and three full-size kitchens. The extent to which these kitchens are used was beyond the scope of this assessment.

Educational Kitchen Spaces

There two lab-style kitchens specifically used for teaching and classes in the Department of Human Nutritional Sciences and the Department of Food Sciences.

CanU Canada is an after-school program that inspires hope and confidence in inner city youth. The CanU program that operates out of the University of Manitoba is the only group other than classes that has access to the lab kitchen in human nutritional sciences.

As mentioned in the section providing information on production, the Dairy Science building and Ellis building also contain two food teaching laboratories.

Photo credit: University of Manitoba

Analysis

With 27 different food venues on campus there are a variety of food options to choose from. The food services survey revealed that there are mixed ideas of what represents an ideal food environment and in some cases contradicting information. Investigating the relationship between food availability, food access and food choice/behavior is an area to investigate further. (See Appendix 12).

There are real and perceived limits to nutritious food options and options to support specific dietary requirements at the Fort Garry campus. For example, fresh fruit can be purchased at six of 27 food venues at the Fort Garry campus and one food venue location at Bannatyne campus. The food environmental scan and menu analysis revealed, there were two areas that had fewer options: culturally appropriate food options and dietary specific requirements (vegan and Halal). Recent changes in Campo have taken steps to address these needs. Areas were identified with minimal to zero services available include purchasing groceries on campus, and cooking classes. There is no community or teaching kitchen located on campus that is open to the general university population or the public. There are numerous food preparation spaces available on campus but concerns regarding food safety, storage capacity and awareness were cited in interviews as reasons why these areas are not utilized more.

The cultivation, distribution, preparation, and appreciation of delicious and nutritious food are critical to individual and cultural well-being (Measuring the Food Environment in Canada , 2011). Increasing communication between different groups and offices on campus could help shed light on specific gaps, opportunities for collaboration and increased awareness. Dialogue to support collaborative action will enable progress in this area.

SEE THE POSSIBILITIES

Dalhousie Loaded Ladle

Dalhousie University in Halifax, Nova Scotia is home to the Loaded Ladle which is a levied food cooperative operated for students and by students. Their mandate is to provide affordable, diverse, fresh and healthy food to the Dalhousie community. Their goal is to provide an alternative option to students and allow students to determine what food they eat and how it is produced through participation in the non-profit, open cooperative of students. They have four core purposes that guide the vision of the group.

1. Create more options for students by providing an ethical food service as an alternative to the corporate market-based food system on campus.
2. Make an inclusive, public forum available for all students to join and participate in through their commitment to a consensus-based and non-oppressive democratic structure.
3. Educate the public about food politics on campus and in the community, and broader social and environmental justice issues which surround the production and distribution of food globally.
4. Use food to build a greater sense of community by bringing students together and creating relationships with local food producers.

Photo credit: Jasspreet Sahib Visit: http://www.loadedladle.com/

Reflections

Ideas and suggestions recorded while researching this area include:

- Further examine the relationship between food availability, food access, and food purchasing behavior.
- Increase diversity, culturally appropriate food and dietary specific food options.
    - Hold focus groups to specifically identify what foods students would like to have access to.
- Increase healthy options in vending machines (Frank Kennedy healthy vending machine project)
    - Discuss specific nutritious options to include in vending machines.
- Develop and implement best practices for safety, cleanliness and respect in shared kitchen spaces.

5. FOOD SYSTEM ENERGY INPUTS & FOOD WASTE

Inputs and outputs of food systems can have environmental impacts. When in balance, these flows can be positive and nourishing; left unmanaged or out of balance they can be negative or detrimental. From farm to table, the journey of food requires energy inputs and generates waste at several points. This section will reflect on energy inputs and food waste, a pair of primary inputs and outputs that have system-scale impacts. Although not within the scope of this report, it should be acknowledged that modern food systems have a wide range of other inputs and outputs.

Examples of Food System Inputs and Outputs

Inputs

Energy (multiple forms)
Nutrients
Carbon (soil amendment, bedding for livestock)
Water
Pesticides
Human Factors (time, energy)

Outputs

Waste (multiple forms)
Oxygen
Carbon/pollutant sequestration
Greenhouse gas emissions
Food and Feed
Nutrients

FOOD SYSTEM INPUTS

Other than a few kinds of energy such as gasoline/diesel and fertilizer that supports University research and education activities, very few food system energy inputs are tracked at the University of Manitoba. This is not altogether surprising as food-related transportation energy or food preparation energy are not commonly-applied metrics. Even our ability to understand our use of water, another primary food-system input, is limited by the simplicity of water metering systems that measure water at the building or complex level, not by what the water is being used for (again, not an uncommon data limitation). Thus, it is not possible to produce quantitative results for the energy-focused food system indicators (total energy use; energy efficiency) identified as part of this project. Nonetheless, some anecdotal or qualitative findings are:

- Many local foods are offered for sale on campus, and a few are even produced on campus (see sections related to purchasing and production). The transportation energy associated with these foods is less than food imported from further away.

- Synthetic fertilizer is not used for grounds management on core campus. Grasscycling and compost generated from leaf waste/trimmings or the student garden is used for some beds.

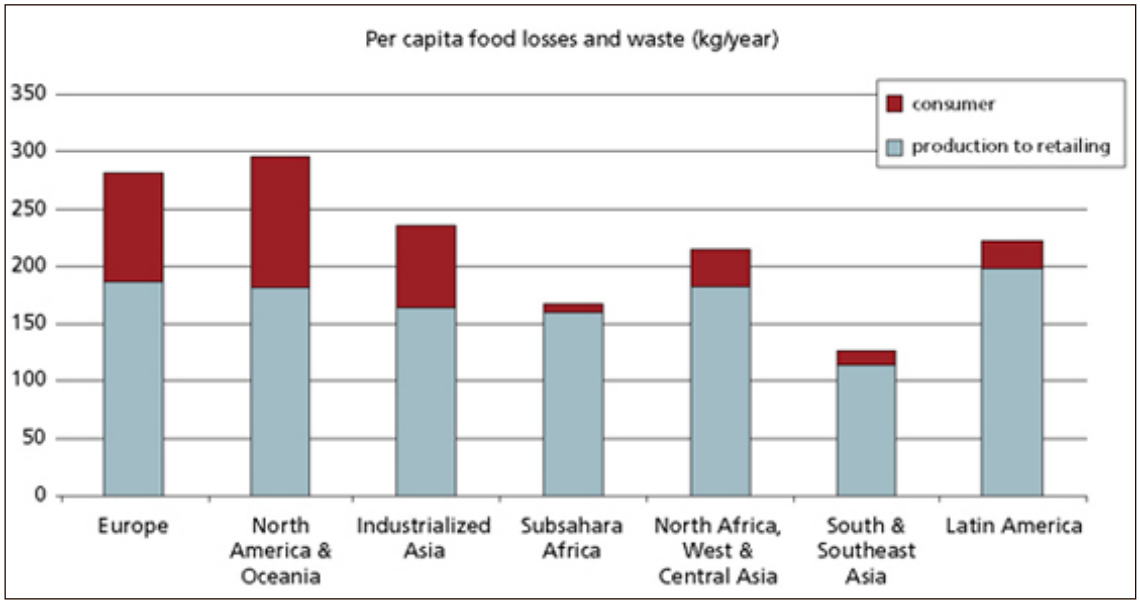
- A multitude of National Centre for Livestock and the Environment (NCLE) research projects underway at Glenlea aim to understand opportunities for more efficient use of energy and resources. For example, trials with new methods of spreading manure could improve nutrient management and the efficiency of nutrient application.

- Much of the kitchen equipment and all of the vending machines that have been installed on campus in the last couple of years are Energy Star certified, denoting superior energy efficiency.

- Overall energy performance at the University has improved substantially over the last 25 years, with the University using 35-39% less energy per square foot in 2013/14 than in 1990/91 (range covers different energy sources). A variety of incremental energy demand reduction and efficiency enhancement projects have resulted in this improvement, and some of these projects have involved food production or preparation sites on campus (for example: high efficiency lamping in greenhouses, Energy Star kitchen equipment and LED lighting in Campo).

FOOD WASTE

According to the Food and Agriculture Organization of the United Nations (FAO), about one third of global food production (around 30 to 40%), is lost or wasted. Global quantitative food losses and waste per year are roughly 30% for cereals, 40-50% for root crops, fruits and vegetables, 20% for oil seeds, meat and dairy plus 30% for fish.



Source: (Food and Agriculture Organization of the United Nations, 2014)

Food waste or loss occurs during production, processing, retailing and consumption. At the level of the end consumer, or in a commercial/prepared food setting, waste is typically categorized as pre-consumer or post-consumer.

Pre-consumer waste is generated at many points in the food supply chain including at:

- manufacturers(packaging).
- food processing facilities.
- supermarkets and retailers.
- cafes and restaurants.

Pre-consumer food waste may result from:

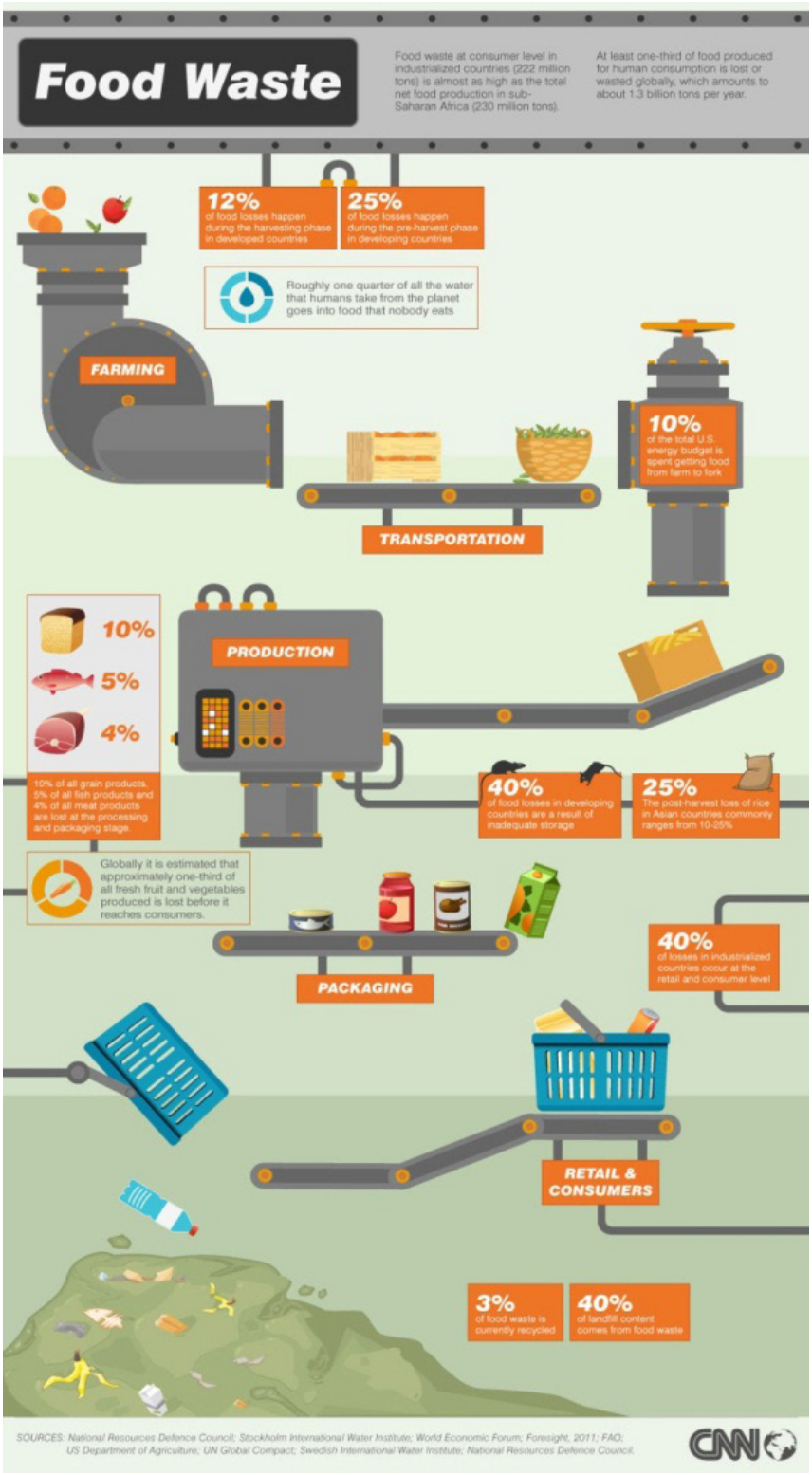
- overproduction.
- spoilage, contamination and exceeding expiry dates.
- products not meeting the demands of the food retailing and wholesaling sectors e.g. size and aesthetic specifications.
- food preparation e.g. over-trimming.

Post-consumer food waste is the food that is thrown away after it has been purchased by the customer. Post-consumer food waste includes:

- customer plate waste from restaurants, cafés and take-out.
- any food purchased in a retail setting (supermarket, cafeteria, bakery) that has been purchased but not eaten.

Post-consumer waste may result from:

- Portion sizes being larger than required or one's 'eyes being bigger than their stomach.
- Food not desirably prepared.
- In the home context, food not able to be prepared.
- Spoilage.



Source: (CNN, 2012)

Food waste is an issue for several reasons:

- It exacerbates hunger and nutrition challenges and the ability of poor farmers to derive income from their operations.
- Food waste that exits the production cycle represents nutrient loss that could, if properly located and managed, be used for beneficial purposes.
- Decomposing organic food waste (such as that buried in a landfill, a typical scenario in Manitoba) produces methane, a potent greenhouse gas.
- Food packaging consumes resources, including petroleum, aluminum and steel.
- Many kinds of food packaging do not readily decompose; for example, Styrofoam can take over 500 years to degrade.

Food Waste at the University of Manitoba

Food waste on campus was researched as part of developing the food system baseline. Although many aspects of waste from the food system are not currently tracked, a body of evidence has been assembled.

- In 2013/14, the total waste produced and handled by the University's Fort Garry Campus was 2,114 metric tonnes. It should be noted that some kinds of special wastes (hazardous waste) and wastes handled by contractors (such as construction and demolition waste) are not included in this figure.
- A variety of waste diversion programs (outlined below) are used to divert approximately 23% of this waste from landfill (484 metric tonnes in 2013/14). Typically, these programs require waste producers/individuals to select a stream into which waste is placed (typically a coloured bin or special box).
- Figures from the City of Winnipeg suggest that in 2009 25% of residential waste sent to landfill was food waste. At least another 28% was other organic materials (leaf and yard waste, pet waste, paper, wood waste).[1] For the sake of estimation, if we apply these portions to the University's waste stream (which is recognized as being somewhat different from residential flows), that would suggest we may be producing about 408 metric tonnes of food waste and up to 456 tonnes of other organic waste per year. A campus-wide waste audit conducted in 2005 developed similar estimates for organic waste.

[1] [See graphic on p. 29 -http://www.winnipeg.ca/finance/findata/matmgt/documents//2012/153-2012//153-2012_Appendix_E-Comprehensive_Integrated_Waste_Management_Plan.pdf]

Reduction and Reuse

At the consumer level, reduction of the need for disposable food containers is quite visible: many community members choose reusable mugs and water bottles. Less frequently, reusable cutlery or takeout containers are used. These behaviors are supported by food service outlets that offer 25-cent "Lug-a-Mug" discounts to patrons with reusable mugs or that charge extra for disposable take-out-food containers. Over 30,000 disposable cups have been kept out of landfills by providing $7,500 in customer discount incentives through the Lug-A-Mug program since September 2012.

Several food service outlets, including Daily Bread Café, St. Andrews College Cafeteria, Belltower Café, Degrees Diner, Pembina Hall, Edna Fedya and The Hub offer reusable plates, cutlery, and cups for dine-in patrons. Some locations, such as Starbucks and Subway, do not and every patron – whether dining in or taking food or beverages out – is provided with disposable containers.

Behind the scenes, reusable pallets, milk crates, bread trays and kegs are de rigeur for many of the University's food wholesalers.

Recycling

There are recycling collection points in all University buildings. The recycling program collects items such as pop, juice and water bottles; milk cartons, juice boxes, yogurt containers, squeezable bottles, peanut butter containers, salad dressing containers, and ketchup containers. Recyclable containers are transferred to the lower level of University Centre, then recycling is sorted by University of Manitoba Recycling and Environment Group (UMREG) staff. Paper and baled boxboard are handled separately and shipped directly to local processors after being collected from buildings.

Cooking oil that has been used for frying food can also be recycled. Used cooking oil can be refined into different types of biofuels used for power generation and heating. A significant benefit is that biofuels derived from recycled cooking oil typically burn cleanly, have low carbon content and don't produce carbon monoxide. Cooking oil recycling also results in less used oil being disposed of in drains, which can clog sewage lines due to the build-up of fats. Degrees Diner recycles their used oil and provides it to students that use biofuels to run their vehicles. Other campus food service operators participate in commercial fryer oil recycling programs.

Compost

Composting refers to the process of decomposition of organic materials, such as food wastes, into materials that can be reused such as biogas or, most commonly, a soil amendment. Organic waste can include pre-consumer kitchen scraps or post-consumer plate waste from restaurants, cafeterias or takeout. Composting can take the form of simple compost piles or bins, or more sophisticated in-vessel systems. Composting can help recycle nutrients, reduce greenhouse gas emissions and, if it generates a soil amendment, support production of more food.

The University of Manitoba does not have a comprehensive composting system in place, and as compared to some other jurisdictions, until very recently few processing options existed in Manitoba (for instance, there is no municipal kitchen waste composting program in Winnipeg).

Nonetheless, several small-scale composting programs exist at the University:

1. UM Food Services/Aramark collects pre and post-consumer organic food waste from the Pembina Hall cafeteria. In 2013, 47,620kg of organic waste was collected and processed by Samborski, a local composter/soil company. As Samborski recently ceased being able to accept compost, a new avenue for processing is being sought.
2. St. Andrew's College food service partners take some pre-consumer waste home to compost in a backyard composter.
3. Degrees and The Hub collaborate with the UMSU garden to compost some pre-consumer and post-consumer waste at the garden site on Chancellor Matheson Rd.
4. St. John's College makes occasional use of a compost demonstration site originally developed by Resource Conservation Manitoba (now Green Action Centre) adjacent to parking lot "A" for disposal of pre-consumer organic waste. Several other offices, including UMREG and the Office of Sustainability also use this site.
5. UMREG maintains an office-scaled vermicomposter in their space on the 100-level of Helen Glass.
6. Anecdotally, it is known that some staff and students take their food waste home to compost in home compost bins.

Collectively, these programs are estimated to divert about 50 to 60 metric tonnes of waste from the landfill.

As well, Degrees and The Hub provide compostable take-out containers, cups and cutlery to patrons taking food and beverages away (an additional charge is levied for the food containers). Very few, if any, of these containers are composted, since no stream is available to individuals to capture these containers. However, it should be noted that these containers are typically made from renewable materials (paper, corn starch) and the decomposition time for these containers when placed in a landfill is likely significantly less than some of the alternatives (Styrofoam is 500+ years).

EDUCATION & RESEARCH (WASTE)

There is a wide range of education and research opportunities at the University of Manitoba related to supply chain management, agriculture, engineering, economics and natural resource management that consider waste reducing practices and technologies. Few courses of study look solely at food waste, and at this point in time there are no known education or research projects that have specifically studied food waste at the University. There are however courses within the Plant Science department which educate on urban agriculture and sustainable food management. There are courses in Biosystems Engineering that look at food waste processing or Biorefining, which discusses the design of proper conditions for processing biomaterials for production of biofuels and bioproducts. The University does own a Byproduts Processing Research and Demonstration Facilty that uses not only the anaerobic digestors but also supports the infrastructure for composting on campus.

At the Glenlea Research Station there is a Byproducts Processing Research and Demonstration Facility that supports composting research.. As well, an anaerobic digester is used to generate biogas from liquid hog manure. Using this biogas as a fuel for automobiles or as a natural gas subsitiute would require additonal refining/processing and is therefore only feasible at a much larger scale. Anaerobic digestion involves organic matter being broken down by microorganisms when there is no oxygen present. The process occurs naturally in lakes, and can be replicated in a closed system such as a stainless steel tank. The gas produced by this process is called biogas and is made up of methane, carbon dioxide as well as other gases. Typically it is harder to achieve properly controlled anaerobic digestion in a colder climate, therefore researchers at Glenlea are testing the placement of a digester inside a greenhouse to make winter experimentation

Image: Students learn about anaerobic digestion at Glenlea Research Station

SEE THE POSSIBILITIES

University of British Columbia

UBC has a closed-loop composting program which turns organic waste, like food scraps, into nutrient-rich soil used for landscaping on campus. In 2010, approximately 25 per cent of UBC's organic waste was composted through the program, meaning 75 per cent was sent to the landfill.

The Forks & University of Winnipeg

The Forks currently composts materials from onsite restaurants and fresh food producers at The Forks Market. Between our five full-service restaurants, 15 fast food merchants, seven fresh food producers, the hotel and all the yard trimming from the site, the Forks generates a lot of organic waste (up to 80% of the Forks's "garbage" is organic and compostable). The Forks uses an industrial in-vessel composter called BIOVATOR that can handle up to 300 tonnes of waste each year and creates the perfect conditions for the trillions of microbes and bacteria to do their work of digesting organic matter. This process elevates a nutrient-rich compost to use as top-dressing and soil amendment in their gardens. Organic waste from other offices (e.g. City of Winnipeg and Assiniboine Credit Union) and from the University of Winnipeg is processed by the Forks on a contract basis.

REFLECTIONS

Comments and suggestions heard during research for this section included:

- Implement a procurement specification that mandates Energy Star certification for new kitchen equipment (refrigerators, freezers, etc.).
- Develop a University waste minimization strategy that considers prevention strategies, and elimination of organic waste-to-landfill.
- Implement bans on disposables or institute a mandatory charge for their use, recognizing that there are costs (typically borne by all members of the University community, and students especially) associated with managing waste. Use revenue from these charges to build programs to support reusable materials.
- In June 2014 the Province of Manitoba launched a new $1-million annual fund designed to triple the amount of organics that Manitoba diverts from landfills by 2020. Consumer demand has supported the recent establishment of new licensed composting processors in Manitoba. These recent developments point to new opportunities for composting at the University of Manitoba.

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APPENDICES

Appendix 1: Contacts for Food Systems Baseline Assessment

Contact name	Department/Area
Campus Food Service Providers	
Dean Duff	Food Services - Aramark
Ainsley Mitchell	Marketing manager
Tina Horsely	Sustainability Coordinator for Aramark
Clark Cunningham	UMSU
Thomas Blumer	UMSU
Ian Park	St John's
Maria Viera	Director of Catering services
Andrea Edmunds	Director of Ancillary Services
St. Paul's College	St. Paul's Belltower Café
St. Andrew's College	St. Andrews Food Services
Faculty and Research	
Contact name	Department/Area
Dr. Michael Trevab	Professsor in Food Science
Gary Martens	Instructor in Plant Science
Dr. Karin Wittenberg	Associate Dean in Agriculture
Dr. Rob Currie	Department Head of Entomology
Dr. Martin Entz	Professor in Plant Science
Dr. Laurie Conner	Department head of Animal Sciences
Dr. Arnie Hydamaka	Professor in Food Science
John Thoroski	Dairy Processing Pilot Plant Manager
Dr. Gary Anderson	Department head of Biological Sciences
Dr. Carla Zelmer	Professor in Biological Sciences
Dr.Gustaaf Sevenhuysen	Post Dean of Human Ecology
Dr. Joyce Slater	Professor in Human Nutritional Sciences
Dr. Shirley Thompson	Professor in Natural Resource Institute
Dr. Stepane McLachlan	Professor in Geography
Siobhan Maas	Bruce D. Campbell Farm & Food Discovery Centre
Guy Robbins	Bruce D. Campbell Farm & Food Discovery Centre

University Staff	
Contact name	Department/Area
Brian Rivers	Director of Physical Plant
Lyle Morris	Manager of grounds and general services
Ophelia Morris	Waste Prevention Coordinator
Maire McDermott	Office of Change Management
John Sinclair	Chair of University of Manitoba Sustainability Committee
Anders Annell	Coordinator for UMREG
Thelma Lussier	Executive Director of the Office of Institution Analysis
Sonja Stroud	Space Planner, Campus Planning Office
Paul Dugal	Director of Purchasing
Student Services	
Contact name	Department/Area
Carol Nabanoba Musoke	Engineers without Borders
Katie Kutyck	Health and Wellness Coordinator
Barry Stone	Director of Student Residence
Jane Lastra	Director of Financial Aid and Awards (supervisor for Foodbank)
Brendan Hughes	Executive director Student Engagement
Community	
NuEats	kg@mahrn.ca

Appendix 2: Production and Processing Faculties, professors, students and courses

Faculties, departments and courses[2]

Total Faculties	2
Total departments	9
Total faculty members (includes professors, instructors, senior scholars and adjunct professors)	87
Total students enrolled (Based on student enrollment report November 1, 2014)	1178
Total courses	Over 120
Faculty of Agricultural and Food Sciences	
Department of Agribusiness and Agricultural Economics	11
Department of Animal Science	18
Department of Entomology	6
Department of Food Science	20
Department of Plant Science	27
Department of Soil Science	26
Department of Human Nutritional Sciences	18
Faculty of Engineering	
Department of Biosystems[1]	13

[1] Note that Biosystems Engineering is part of both the Faculty of Engineering and the Faculty of Agricultural & Food Sciences.

[2] Information was accessed online from the University of Manitoba's website. Faculties were identified as to different components of the food systems. Each faculty page was explored and information about departments, staff/researchers, courses available was recorded.

Appendix 3: Production and Processing Research Facilities

1. Glenlea Research Station (Glenlea, MB) - Facilities for swine, beef and dairy cattle, feedmill and field research.

2. Ian M. Morrison Field Research Farm (Carman, MB)

3. George Weston Ltd. Sensory and Food Research Lab (Fort Garry Campus)

4. Barbara Burns Food Innovation Laboratory (Fort Garry Campus)

5. Poultry Research Unit (Fort Garry Campus)

6. T. K. Cheung Centre for Animal Science Research (Fort Garry Campus)

7. Animal Science, Nutrition, Biochemistry and Immunology Laboratories (Fort Garry Campus)

8. Large Animal Biosecurity Laboratory (Fort Garry Campus)

9. Gut Microbiome Laboratory (Fort Garry Campus)

10. The Point Field Research Laboratory (Fort Garry Campus)

11. Dairy Processing Pilot Plant (Fort Garry Campus)

12.Ellis Food Processing Pilot Plant (Fort Garry Campus)

RESEARCH CENTRES:

13. National Centre for Livestock and the Environment (Glenlea, MB)

14. Richardson Cente for Functional Foods and Nutraceuticals (Fort Garry Campus - Smart Park)

15. Canadian Wheat Board Centre for Grain Storange Research (Fort Garry Campus)

16. Canadian Centre for Agri-food Research in Health and Medicine (St. Boniface Hospital) - multi-agency, multi-faculty centre

FEDERAL RESEARCH CENTRES ON FORT GARRY CAMPUS:

17. Department of Fisheries and Oceans (Fort Garry Campus)

Appendix 4: Fort Garry Campus Production

Fort Garry Campus Production

	Highlights	Opportunities
UMSU Community Garden	Degrees uses some food items that are produced by the UMSU campus garden. Includes lettuce, beets, and carrots during the summer. The community garden uses the agriculture greenhouse to start seedlings. The community garden has individual plots that can be rented annually as well as larger community space where there are volunteer opportunities. As a volunteer, you will receive a portion of the garden's yield	Increase the yield, existing space on campus could be used that is irrigated or has consistent access to water for increased growth. Cross cultural and intergenerational learning opportunities. Workshops could be constructed to help educate students and staff about growing food and harvesting. Partnering with Biological Sciences greenhouse to increase engagement and worshop options.
Rainbow Community Garden	The Rainbow Community Garden is a project of the Immigrant Integration Farming Co-op. They share the space with the UMSU community garden.	Cross cultural and intergenerational learning opportunities.
Edible Landscaping - 2nd Floor patio - University Centre	Created in 2013, the second year will be planted with beans, peppers, herbs and other vegetables instead of flowers. This is a partnership between the UMSU community garden and the Physical Plant.	Parterning with Landscape Architecture. Planting vegetables in planters and pots around campus would increase the visibility of local food as well as provide more accessiblity of fresh options on campus.
Fruiting Trees	Inventory of trees was done in 2002, but no GIS coordinates were taken. There was an apple orchard located in front of St. John's that was relocated during construction of the theatre but has not been moved back yet.	Inventory of trees was compiled in 2002. A updated tree inventory on campus needs to be completed and find opportunities where fruiting trees can be planted and coordinated harvesting can occur.
The Point	Experimental fields managed by plant science. Research studies are conducted onsite. The site previously had fruiting trees. Used for agronomy, plant breeding, horticulture, physiology, plant pathology and plot research by the Department of Plant Science.	The Point has opportunities for edible landscaping along the arch bordering the 100 acres of research land. Planting orchards and fruiting trees would be possible.
Agriculture Greenhouses	Grows all of the flowers for convocation. Urban agriculture classes are also offered.	Students enjoy both scenery as well as some faculties use the greenhouses for developing sketches.
Biological Sciences Greenhouses	Breeds plants and does plant giveway when a surplus has been grown for the campus and community	Could partner with the UMSU community garden to hold workshops about plants and maintenance.
Poultry Research Unit	Houses upwards of 4600 laying hens for research. These hens lay approximately 4200 eggs on a daily basis, which are brought to the University for consumption after processing.	Opportunities for processing to be done on campus, but would require a conversation with Manitoba Egg Farmers and the board since there are particulars with egg quotas in the system.
Honey Bee Hives	Research and minimal honey production (5,000 - 15,000 pounds). Honey when produced is sold to the Manitoba Honey Producers Cooperative (Bee Maid Honey). Honey bees housed at The Point contribute to pollination of all of the vegetables and crops grown on campus.	Food Services could purchase honey directly from Bee Maid.
NuEats Food Innovation	NuEats is a student led initiative developed in 2011. The group is interested in testing out the market to better understand how specialty nutirent enhanced products can be sold. The following are products produced: Cheese, yougurt, ice cream, Buckwheat kernels, Beta-glucan fruit bar.	Aramark and other food service providers using more food products being grown and produced by Agriculture students. Http://www.producer.com/2012/09/students-test-the-marketplace/
Dairy Processing Pilot Plant	At this federally registered and licensed pilot plant, local entrepreneurs are assisted in the start-up of dairy food manufacturing businesses.	Ice cream, yogurt and cheese produced here are currently being sold commercially. More products could be processed/sold onsite if capacity was expanded by the addition of a few key pieces of technology.
Cereal Research Centre of Agriculture and Agri-Food Canada	The Winnipeg location closed in April 2014. The Centre was previously the lead site focusing on the development of superior wheat and oat cultivars for the Canadian prairies. Other areas of research included: biotechnology, plant pathology, cereal chemistry, cereal genetics, and quality evaluation.	The centre closed in April 2014. The Morden location houses the research projects.

Appendix 5: Agriculture Research Facilities

Agriculture Research Facilities

Research Station	About	Major Research
Entomology Bee Research Facility	Located at The Point, infrastructure includes bee hives, a honey house and indoor wintering facility. During the summer, honey bees are also housed at the Glenlea Research Station or on cooperating farmers' fields.	Colony overwinter survival strategies. Marker assisted selection as a way to improve local stock and innovative approaches to controlling bee viruses.
Glenlea Research Station	Accommodates both multidisciplinary and livestock research and is home to the NCLE (National Centre for Livestock and the Environment). UofM-based research community engages in research partnerships that focus on the economic and environmental sustainability of integrated livestock and crop production systems. Livestock facilities for beef, dairy (60 lactating cows) and pig (260 sows).	Glenlea long term organic and conventional rotation comparison. TGAS greenhouse gas emissions from cropland. NCLE long term manure and crop management study. Sustainable forage beef production systems research program. Sow group housing systems research (health, performance, and wellbeing) research program. Dairy productivity and gut health. Microbial communities in agriculture systems.
Ian N. Morrison Field Research Farm		Weed ecology and management to improve sustainability and reduce the risks/effects of herbicide resistance. Organic cropping systems including integrating livestock (sheep). Cropping systems including cover crops, companion cropping, polyculture, perennial grains. Plant breeding: winter and spring wheat, canola, rapeseed, perennial grains and new potential crops. Plant disease, plant nutrition, soil fertility, entomology, forages, manure management research.
Canadian Centre for Agri-food Research in Health and Medicine	The Canadian Centre for Agri-Food Research in Health and Medicine (CCARM) is dedicated to investigating and understanding the potential health-related benefits found in nutraceuticals, functional foods, and natural health products (health food).	Example studies: Gender effects of dietary omega-3 fatty acids from plant and marine sources on oxylipins in healthy humans; Blinded, Randomized, Controlled Study to Examine the Bioavailability of Compounds from Different Bean Varieties in Healthy Individuals
Canadian Wheat Board Centre Grain Storage Research		Research of improving stored grains and preventing moisture gains and fungal situations from arising. Cross faculty collaborations to provide accurate and innovative information, data and design research.
Richardson Centre for Functional Foods and Nutraceuticals	Dedicated to discovery, discussion and development of functional foods and nutraceuticals that can make positive impacts on public health through crops and grains.	Research of disease fighting compound in functional foods such as grains and enhanced foods.
Canadian Centre for Agrifood Research in Health and Medicine	Research on potential health benefits in foods, natural products and nutraceuticals.	Create positive and healthy results that translate into food and health products that will directly affect public health and fight or prevent diseases.

Appendix 6: Production and Processing Opportunities

Action	Players Included
UMSU Garden	Students, staff, community
Use the eggs produced on campus in food services	Poultry research unit, Manitoba Egg Farmers, Food service providers on campus
Use the honey produced on campus in food services	Manitoba Honey Producers Cooperative (Bee Maid Honey), Food Services
Increase opportunities for edibale landscaping around campus	Department of Landscape Architecture, Department of Plant Science, Department of Human Nutritional Sciences, Physical Plant, food service providers and the Office of Sustainability
Increase awareness about workshop and education related to production opportunitoes	UMSU Garden, Department of Biological Sciences, Department of Plant Science, health and wellness units
Integrate edible landscaping into the Southwood land development	Campus Planning Office, Physical Plant, Department of Plant Science, UMSU Garden
Increase awareness and celebrate research related to sustainable agricultural practices and sustainable food systems	Marketing and Communications Office, Faculty of Agricultural and Food Sciences, National Centre for Livestock and the Environment, Office of Sustainability
NuEats working more closely with food service provides on campus to integrate their food products	Food service providers

Appendix 7 – Purchasing policies and Sustainable Food Measurements

http://www.umanitoba.ca/admin/governance/governing_documents/financial/392.html

Appendix 8 - University of Manitoba policies that impact food purchasing.

	Purchasing policy
University of Manitoba	*Sustainability at the University of Manitoba- A Strategic Vision for Action:* Approved and endorsed by the President in May 2012, this document serves as a guide for promoting sustainability at the University in different areas including purchasing. The document forwards the idea of incorporating principles of sustainability in all procurement decisions. Seven goals were presented in this document: 1. Create a sustainable purchasing framework with appropriate standards for inclusion in the RFP and tender processes and for Purchase Order notes. 2. Research 3rd party certifications to identify those that fit the vision statement. 3. Implement the Supplier Relationship Management Program (ROSE initiative). 4. Increase number of sustainable products and services procured at the University while also emphasizing reduction of products as first priority. 5. Campus-wide acceptance and implementation of sustainable purchasing practices. 6. Explore the idea of purchasing consortiums with other large organizations. 7. Use life-cycle cost analysis for all acquisitions over a thousand dollar value & where appropriate to end of life discussions.

Above table taken from the STARS 2.0 technical manual for measuring the sustainability of campuses food services purchasing of food and beverages.

Aramark	As a rapidly evolving field of study, Aramark defines 'sustainable food' in terms of the changing local priorities of the regions in which they operate; At UofM, the campus definition must be the primary guiding element in how and where the company applies the focus of its initiatives"
UMSU	Ethical purchasing policy Organizations such as UMSU have, by virtue of their operations, significant impact on the social, economic, and ecological fabric of society. UMSU therefore has an opportunity and obligation to ensure that their operations maintaining the objectives of the organization. benefit the community-at-large as much as possible while still When making decisions of whom to purchase from or what goods or services to purchase, UMSU shall prioritize: 1. Minimizing, and preferably avoiding, the purchase of goods or services that are socially, economically, or ecologically exploitative or destructive, 2. Local businesses, as a means of supporting the local economy and residents of Winnipeg and Manitoba, 3. Suppliers, goods and/or services that can best achieve the broader social-justice mandate of UMSU, 4. Organizations that are unionized or run as a worker co-operative, 5. Suppliers that are fair-trade certified by a legitimate fair-trade labelling organization that is independent of industry. Boycotts UMSU shall maintain a Boycott List. UMSU shall boycott, or refuse to purchase goods and services from, any: 1. Companies that are currently on the UMSU Boycott List, or 2. Goods with a country-of-origin currently on the UMSU Boycott List. The Campaigns and Government Relations (CGR) Committee of UMSU is responsible for researching and selecting companies and countries-of-origin to formally boycott, which will be sent to UMSU Council for approval. The Boycott List shall be reviewed annually by the CGR Committee. For suppliers/producers currently on boycott, UMSU shall attempt to source goods and/or services from alternative sources. If they are unable to find an acceptable or equivalent good or service, they can purchase goods and/or services from the supplier/producer on boycott.

Appendix 9 - Sustainable Food Measurements[4]

Criteria	Recognized Standards and Certifications
Ecologically Sound	• Canada Organic Biological certified • Certified Bird Friendly by the Smithsonian Migratory Center (coffee) • Certified Local Sustainable (Local Food Plus) • Certified Organic by an IFOAM-endorsed standard • Demeter Certified Biodynamic • European Union (EU) organic logo • Food Alliance Certified • Marine Stewardship Council Blue Eco-label • Monterey Bay Aquarium Seafood Watch "Best Choices" • Protected Harvest Certified • Rainforest Alliance Certified • USDA Certified Organic
Fair	• Ecocert Fair Trade (EFT) • Fair Food Standards Council (U.S. tomatoes) • Fair for Life and other IMO certifications • Fairtrade (Fairtrade international/FLO and its members Fair Trade Canada and Fair Trade America) • Fair Trade (Fair Trade USA) • FairWild Certified • Food Justice Certified (Agricultural Justice Project) • Small Producers' Symbol (FUNDEPPO)
Humane	• AGA Grassfed (beef) • American Humane Certified • Animal Welfare Approved • Certified Humane Raised and Handled (Humane Animal Farm Care) • Global Animal Partnership)

[4]Table taken from the AASHE STARS 2.0 technical manual for measuring the sustainability of campuses food services purchasing of food and beverages.

Appendix 10 - Farmers, processors and suppliers supported by University of Manitoba Food Services & Degrees Diner[5]

	Name	Foods	Category (Farmer, processor, supplier)	Location (address)
	Beverages			
1	GreenBean Coffee Imports	Coffee	Processor	Winnipeg, MB
2	Half Pints Brewing Company	Beer	Processor	Winnipeg, MB
3	Wellington Fine Coffees Ltd	Coffee, Tea, Hot Chocolate	Processor	Winnipeg, MB
4	*Vegetables and fruit*			
5	Loveday Mushrooms,	Mushrooms	Farmers	Winnipeg, MB
6	Southern Manitoba Potato Company	Potatoes	Farmers	Winkler, MB
7	Kroeker Farms	Potatoes, Onions	Farmers	Winkler, MB
8	Poplar Grove Farms	Organic Red and Yellow Russet Potatoes, Onions, Carrots	Farmers	Winkler, MB
9	Connery River Farm	Green Onions and a variety of produce	Farmers	Portage La Prairie, MB
10	Mayfair Farms	Variety of Produce – e.g. Broccoli, Cauli-flower, Cabbage, Peppers, Potatoes, Onions, Beets, Carrots, Strawberries, Raspberries	Farmers	Portage La Prairie, MB
11	Peak of the Market	Produce Amalgamator Variety of Local Fruits and Vegetables	Farmers	Winnipeg, MB
12	Fresh Options Organic Delivery	Organic Groceries and Products	Supplier	Winnipeg, MB

13	De Luca's Specialty Foods	Variety of Pastas, Meats, Cheeses and Other Varieties	Supplier	Winnipeg, MB
	Cheese, Dairy and Eggs			
14	Bothwell Cheese	Variety of Cheeses	Producers and processors	New Bothwell, MB
15	Manitoba Dairy	All -Fluid Milk, Creams, Butter	Producers and processors	
16	Local farms	Burnbrae Cage Free Eggs	sourcing from multiple farms	Springstein & Winnipeg MB
17	Granny's Poultry Co-op,	Chicken, Turkey	Producers and processors	Winnipeg & Blumenort MB
18	Vestfold Ranches,	Chicken, Turkey	Farmers, producers	Inwood, MB
19	Dunn Rite	Poultry	processor/supplier	Winnipeg, MB
20	Manitoba Pork	Pork	various producers and suppliers e.g. Maple Leaf	Winnipeg, MB
21	Toledo Meats	Variety	Supplier	Winnipeg, MB
22	Cypress Meats	Variety	Supplier	Winnipeg, MB
23	Midland Foods	Variety	Supplier	Winnipeg, MB
24	Halal Meat Center	Variety	Supplier	Winnipeg, MB
	Grains & Other Products		Supplier	Winnipeg, MB
25	Nature's Farm Pasta	Pasta	Processors	Steinbach, MB
26	Shoal Lake Wild Rice	Rice	Producers and processors	Winnipeg, MB
27	Local bakeries e.g. Gunn's Bakery, City Bread	Breads and Baked Goods	Processors	Winnipeg, MB
28	Local Pulses	Lentils, Legumes	Processors	
29	Local Honey	Honey	Processors	Winnipeg, MB
30	Richardson's Oilseed	Canola products	Processors	Winnipeg, MB
31	Empire Brand Spices	Spices, Mixes	Processors	Winnipeg, MB
32	McCain Foods	Frozen Potato Products	Processors	Portage-La-Prairie & Carberry, MB
33	Old Dutch	Potato Chips	Processors	
34	Lien's Spring rolls	Spring Rolls	Processors	Winnipeg, MB

[5]This is not a comprehensive list of all of the local farmers, processors and suppliers being supported by food service providers at the University of Manitoba. The list was compiled based on information provided by food service providers that are currently using tracking systems.

Appendix 11- Departments, faculty and courses related to Food Security, Health and Wellness

FOOD-RELATED COURSES AT THE UNIVERSITY OF MANITOBA		
Faculty	Department	Courses
Agricultural and Food Sciences	Argribusiness and Agricultural Economics	· Agriculture Economy and Market 1 · Financial Management 1 · Agribusiness Management · Merchandise and Sales Management · Agricultural Policy · Farm Business Management · Introduction to Agribusiness Management · Economics of World Food Issues and Policies · World Agriculture Study Trip · Introduction to Agricultural and Food Marketing · Agricultural and Food Policy · Farm Management · Agribusiness Portfolio Management · Agriculture Market Regulations · Agriculture Marketing Research · Research Methodology · Topics in Agriculture Economics · Agriculture Economic Development · Current Issues · Agriculture Business · Agriculture Policy · Optimization · Advanced Agricultural Trade and Economic Development · Advanced Theory and Research in Economics · Research Management
		· Business Communication · Natural Resources and Primary Agricultural Production · Utilizing Agriculture Production · Plant and Animal Physiology
	Animal Sciences	· Animal Health · Beef Production · Dairy Production · Swine Production · Poultry Production · Special Topics in Livestock · Animal Production · Anatomy and Physiology 2 · Nutrient Toxicology · Feeds · Animal Reproduction · Animal Environments · Livestock Problems · Systems Modeling · Grassland Agriculture · Animal Health
Agricultural and Food Sciences	Animal Sciences	· Ruminant Meat · Ruminant Milk · Monogastric Production · Avian Production · Animal Issues · Advanced Application of Animal Nutrition · Seminar · Protein Nutrition and Metabolism · Energy/Carbohydrate Nutrition and Metabolism · Lipid Nutrition and Metabolism

Faculty	Department	Courses
Agricultural and Food Sciences	Animal Sciences	· Vitamin Nutrition and Metabolism · Mineral Nutrition and Metabolism · Phytochemical Nutrition and Metabolism · Methodology
	Entomology	· Crop Protection Entomology · Pollination Biology · Beekeeping (open to public) · Pest Management and Farm Insects
	Food & Nutrition Grad Studies	· Advanced Seminar in Food and Nutritional Sciences
	Food Science	· Food Safety Today & Tomorrow · Food Chemistry · Food Process 1 · Frozen Dairy Products · Cheese and Fermented Milk Products · Baking Science and Technology · Food Engineering Fundamentals · Grains for Food and Beverage · Processing of Animal Food Products · Food Process 2 · Food Microbiology 1 · Food Analysis 1 and 2 · Quality Control in Foods · Food Research · Analysis of Water and Wastes · Water Management in Food Processing · Introduction to HACCP · Food Safety and Regulations · Food Product Development · Functional Foods and Nutraceuticals · Unit Process Operations · Food Proteins · Food Carbohydrates · Food Science of Cereal Grains · Advanced Food Microbiology
	Food Science	· Topics in Food Science · Advanced Meat Science · Food Rheology
School of Agriculture	Biosystems Engineering	· Farm Machinery · Agriculture Survey Systems · Unit Operations 1 · Unit Operations 2 · Radiation Processing of Food and Agriculture · Bioprocessing for Biorefining · Management of By-Products from Animal Production · Crop Preservation · Precision Agriculture Concepts and Applications (Graduate) · Mechanical Behavior of Biological Materials · Water Management (Gradutate) · Crop Preservation and Handling (Graduate) · Food Process Engineering
	Agriculture	· Environmental Plans
	Plant Science	· Cereal and Oilseed Production Practices (Diploma) · Vegetable Production · Genetics · Plant Biotechnology

Faculty	Department	Courses
School of Agriculture	Plant Science	· Plant Physiology · Vegetable Production · Vegetable Production · Fruit Production · Special Crops (Diploma) · Landscape Horticulture (Diploma) · Diversification with Horticultural Crops · Special Topics in Crop Management · Organic Crop Production on the Prairies (Diploma) · Urban Agriculture · Crop Production · Fundamentals of Horticulture · Horticultural Food Crops · Special Problems in Plant Science (Graduate) · Topics in Plant Breeding and Genetics (Graduate) · Plant Genomics (Graduate) · Advanced Plant Breeding (Graduate) · Plant Science Seminar (Graduate) · Forage and Pasture Management (Diploma) · Special Crops (Diploma) · Pesticides: Environment, Economics and Ethics · Field Methods in Land Resoruce Science · Physical Properties of Soils · Soil Chemistry and Mineralogy · Soil and Water Management
		· Remediation of Contaminated Land · Soil Fertility · Agroecology · Environmental Chemistry of Pesticides and Related Compounds · Pesticide Research
	Soil Science	· Introductory Soils and Crops · Soil Productivity and Land Use · Soil Conservation and Management · Soil Fertility · Agricultural Micrometeorology (Graduate) · Environmental Chemisty of Pesticides and Related Compounds (Graduate) · Topics in Soil Fertility (Graduate) · Topics in Landscape and Processes 1 (Graduate) · Topics in Landscape and Processes 2 (Graduate) · Advanced Soil Ecology (Graduate)
Arts	Anthropology	· Economic Systems · Anthropology of Food
	Arts	· Technology and Society 2
	Religion	· Food: Religious Concepts and Practices
Dentistry	Oral Biology	· Cariology and Plaque Associated Diseases · Nutrition in Dentistry
School of Dental	Dental Hygiene	· Nutrition in Dentistry
Environment, Earth & Resources	Geography	· Food Geographies
	Natural Resource Management	· Ecological Dimensions of Resource and Environment Management · Sustainable Livelihoods, Food Resources and Community Food Security
Graduate Studies	Pharmacy	· Applied Nutrition for Healthcare Professionals
Human Ecology	Human Nutritional Sciences	· Food: Facts and Fallacies · Nutrition for Health and Changing Lifestyles · Nutrition Through the Life Cycle · Basic Principles of Human Nutrition · Composition, Functional & Nutritional Properties of Foods

Faculty	Department	Courses
Human Ecology	Human Nutritional Sciences	· Principles of Food Preparation and Preservation · Food Quality Evaluation · Vitamins and Minerals in Human Health · Macronutrients and Human Health · Nutrition Education and Dietary Change · Ingredient Technology for Designed Foods · Management for Food and Nutrition Professionals · Culture and Food Patterns · Food Geographies · Senior Thesis · Research Project in Human Nutritional Sciences · Quantity Food Production & Management · Seminar in Foods and Nutrition · Selected Topics in Food Research · Selected Topics in Nutritional Research · Sensory Evaluation of Food · Food Product Development · Food, Nutrition and Health Policies · Community Nutrition Intervention · Nutrition & the Elderly · Nutrition Management of Disease States · Practical Applications of Food and Nutrition · Maternal & Child Nutrition · Nutrition in Exercise & Sport · Foods Industry Option Practicum · Nutrition Option Practicum · Functional Foods & Nutraceuticals · Practice-based Research in Human Nutritional Sciences · Advanced Problems in Foods · Advanced Problems in Nutrition · Seminar in Foods and Nutrition Research · Protein Nutrition and Metabolism · Energy and Carbohydrate Nutrition and Metabolism · Lipid Nutrition and Metabolism · Vitamin Nutrition and Metabolism · Mineral and Trace Element Nutrition and Metabolism · Phytochemical Nutrition and Metabolism · Chemistry and Function of Food Lipids · Flavor Chemistry and Sensory Properties of Foods · Nutraceuticals in Human Health · Nutrition in Public Policy · Nutritional Epidemiology · Current Topics in Human Nutrition · Theoretical Approaches to Dietary Change Intervention
Science	Biological Sciences	· Economic Plants
	Botany	· Economic Plants
	Chemistry	· Elements of Biochemistry 1 · Elements of Biochemistry 2
	Microbiology	· Microbiology 1 · Elements of Biochemistry 1 · Elements of Biochemistry 2

Appendix 12 - Food Venues and Food Service Providers at the Fort Garry Campus

Food Venues and Food Service Providers at the Fort Garry Campus

Food Venue	Food Service Provider	Type	Hours of Operation	Location	Information Accessed
Greenhouse Café	Aramark	Express Program Hearty Soup Coffee**eco**mpany Bene Pizzeria	Mon-Thurs 8AM- 6PM Fri 8AM - 5PM	Located in Dafoe tunnel - Arts Complex	umanitoba.campusdish.com Aramark in person visit
The Hard Chalk Café	Aramark	Express Program Hearty Soup Tmmy.Ymmy my Coffee**eco**mpany	Mon-Fri 8AM-3PM	Located in education building upper level	umanitoba.campusdish.com Aramark in person visit
The Young Associate's Café	Aramark	Express Program Hearty Soup Tmmy.Ymmy my Coffee**eco**mpany Bene Pizzeria Montague's Deli Pan Geo's	Mon-Thurs 8AM- 4PM Fri 8AM-2PM	Located in Drake Centre	umanitoba.campusdish.com Aramark in person visit
Dayside Café	Aramark	Express Program Hearty Soup Tmmy.Ymmy my Coffee**eco**mpany Bene Pizzeria Montague's Deli Induction Cooking	Mon-Thurs 8AM- 6PM Fri 8AM - 5PM	Located In University College	umanitoba.campusdish.com Aramark in person visit
University Centre - Campo Café	Aramark	Fresh Grill Healthy Kitchen Pizza Shawarma Wok Get the Good Stuff Subway	Mon-Thurs 10:30AM-6:30PM Fri 10:30AM-3PM *Not all locations are available during the hours of operation	University Centre- Main Floor	umanitoba.campusdish.com Aramark in person visit
Bistro Two O Five	Aramark	Restaurant and Takeout	Mon-Thurs 11:30AM - 2PM Fri 11:30AM-2PM (buffet)	University Centre - 2nd Floor	
GPA's	UMSU	Convenience Store	Mon-Thurs 8AM-9PM Fri 8AM-8PM Sat-Sun 11AM-4PM	University Centre- Main Floor	Online (UMSU website)
IQ's	UMSU	Coffee/tea Starbucks Baked Goods Pizza Bubble Tea Chips and snacks Sandwiches	Mon-Thurs 8AM-12AM Fri 8AM-2AM Sat 12PM-2AM Sun 12PM-12AM	University Centre - 3rd Floor	Online (UMSU website)
Degrees	UMSU	Restaurant and Takeout	Mon-Fri Rest 8AM - 8PM Mon-Fri After hours takeout 8PM -10PM Sat Rest 11AM - 7PM	University Centre - 3rd Floor	Online (UMSU website)
The Hub	UMSU	Restaurant and Takeout	Mon-Tues 11AM - 1AM Wed-Fri 11AM - 2AM Sat 8PM - 2AM Sun 5PM - 1AM	University Centre - 3rd Floor	Online (UMSU website)
Espresso 101	St. John's College	Coffee and Baked Goods	Mon-Fri 8AM-4PM	St. John's College	in person visit
Daily Bread Café`	St. John's College	Cafeteria and Takeout	Mon-Fri 8AM-10PM	St. John's College	in person visit
St. Andrew's Cafeteria and Catering	St. Andrew's College	Cafeteria and Takeout	Mon-Fri 7:30AM-6:15 Sat and Sun 11:30AM-6:15PM *closed between meals	St. Andrew's College	in person visit
Belltower Café	St. Pauls College	Cafeteria and Takeout	Mon-Fri 7AM-4PM Sat 7AM-3PM	Lower level of St. Paul's College	
Edya Fedya	Private Business	Restaurant and Takeout	Mon-Fri 7:30AM-3PM Sat and Sun 8:30AM-3PM	Smart Park in Monsanto Building	http://www.urbanspoon.com/r/332/1411593/restaurant/Fort-Garry/Edna-Fedya-Winnipeg
Cafeteria	Private Business	Snacks	When Facility is Open	Indoor Soccer Complex	
The Fresh Food Company	Aramark	Cafeteria	Mon-Fri 7AM-8PM Sat and Sun 11AM-8PM	Pembina Hall	Campusdish.com