

# FACULTY OF AGRICULTURAL AND FOOD SCIENCES

## 2016-2021 STRATEGIC RESEARCH PLAN

February 2016

### Introduction

The Faculty of Agricultural & Food Sciences (FAFS) has a long history of discovery and innovation that has contributed to the research excellence reputation of the University of Manitoba. The research programs of faculty members have also fostered the research training opportunities for undergraduate and graduate students, as well as other highly qualified personnel, training that has helped the Canadian agriculture industry grow, and cultivated the next generation of food systems researchers. Research is also the foundation for faculty expertise that permits the Faculty to distinguish itself in teaching and to provide informed and sound outreach, particularly for the agriculture sector in Manitoba, but increasingly to global agro-food and nutrition/wellness communities.

This document identifies the Faculty's research strengths and the Faculty's plans to ensure that this research remains a key element of the University's aspirations and progress in its strategic priority, *Driving Discovery and Insight*. The document also identifies Goals and Supporting Actions to foster research excellence that are compatible with those of the *Driving Discovery and Insight* priority. This is the first research plan of the Faculty of Agricultural & Food Sciences that incorporates the natural, engineering and social sciences strengths of departments formerly in the Faculty of Human Ecology with those strengths in the Faculty of Agriculture. It also addresses the present reality of diminishing baseline resources at the University. This reality means that the Faculty must rely more than ever on good relationships with external partners if research in the Faculty is to prosper. Faculty members must also be highly receptive to networking with other researchers (both internally and externally to the University) to leverage our expertise for greater benefit to society.

### Research Plan Context

The Faculty as a whole maintains a balance between applied and basic research, with research support, on a per capita basis, second to none at the University of Manitoba. The applied research, supported primarily by industry, allows integrated application of existing science and technologies to address the emerging complex challenges facing industry and society. However, it cannot be sustained over the long-term without the creative insights and innovative tools generated from discovery-driven programs. All faculty members are encouraged to develop independent research programs and to develop multi-disciplinary research with collaborators in this Faculty, other faculties of the University, and in private and government research organizations and other universities. Nevertheless, a renewed perspective on how we conduct research will be necessary due to changes in University baseline funding and to changes in the Canadian agricultural and food industries. As a result, the decisions we make in the pursuit of research excellence over the next five years must take place in the context of two (potentially) opposing constraints.

## *1. Research is rewarding, but is not a profit-making activity for universities*

Although universities can be proud of how their research accomplishments translate into economic benefit for the province and the country and to the quality of life for Canadians, maintenance of research infrastructure and personnel is an expensive venture. The full institutional costs of research are very rarely recovered. Accordingly, faculty members will face increasing pressure to:

a) Sustain and build research capacity. FAFS researchers will face increasing pressure to secure funds for the technical and office support staff who are critical for the smooth operation of a research environment where discoveries are made, applications are tested and where training of tomorrow's industry and academic leaders is carried out. Funds will also need to be secured to maintain and upgrade major research infrastructure.

b) Demonstrate coherence in research activities. As government agencies and private industry look to get the most return on their research investments, FAFS will need to demonstrate how well a particular research initiative fits with the Faculty's and the University's strategic plans. This will allow potential funders to see the uniqueness of creative efforts at the University of Manitoba, and how a critical mass of researchers in specific areas of specialization (that can tackle complex multidimensional problems) allows research challenges to be addressed efficiently and effectively.

c) Align research activities with those of our partners. In particular, the relevance of our research outcomes to MAFRD and to western Canadian agricultural and food industries and community organizations will need to be recalibrated on an ongoing basis.

## *2. Research is the primary means of sustaining and improving the University's reputation*

Although excellence in education and outreach is an extremely important goal for all faculty members, a U15 research-intensive university such as the University of Manitoba needs to maintain a very strong research excellence profile in order to be viewed as an attractive institution in reputational standings. These ever-more-global standings are increasingly important for attracting the best faculty, the best students and additional funding (from governments, industry and philanthropy). Maintaining research excellence is therefore essential, not just for the health of our research programs, but also for sustaining quality education and outreach in the Faculty of Agricultural & Food Sciences. Accordingly, faculty members will need the freedom to:

a) Continue to make curiosity-driven discoveries. These are not only necessary to bring in a larger proportion of institutional costs per dollar of research revenue, but they are frequently the well-spring for future institutional and FAFS strengths. We should expect that quantitative measures of research impact (such as by SciVal and Google Scholar) will be one means of assessing the reputational quality of this research in addition to assessment of its worth by the securing of Tri-Council funds.

b) Draw in expertise from other Faculties. Fresh ideas and new tools frequently emerge in the basic humanities and sciences. By persisting in our engagement with our colleagues in other Faculties, we have the opportunity to continue to innovate in agriculture, bioproducts, food and nutrition.

c) Establish strong national and international linkages. Fresh ideas also come from interaction and collaboration with external partners, and more often than not these fruitful relationships arise from the freedom of choice extended to individual faculty members.

This research plan identifies current and emerging areas of Faculty research strength that clearly contribute financially and reputationally to the University of Manitoba's international standing. These strengths are also clearly of provincial, national and international importance in agriculture, food, nutrition and health, constituting the backbone of two of the research and research training thrusts identified by the University, and with solid contributions in three others (see Appendix 1). The prospects for renewal of faculty members in the areas of research strength, and plans for the renewal of major research infrastructure are articulated in this plan.

### **Faculty Research Priorities**

The key areas of research and research training for the Faculty are:

- Safe, Nutritious and Healthy Food
- Sustainable Crop and Livestock Production Systems
- Sustainable & Healthy Bioproducts and Biomaterials
- Land and Water Resources Management

#### **1. Safe, Nutritious and Healthy Food**

Expertise in the area of food systems and their downstream health benefits resides across all departments of the Faculty of Agricultural & Food Sciences (FAFS), and through partnerships with researchers at the Richardson Centre for Functional Foods and Nutraceuticals (RCFFN), the Canadian Centre for Agri-Food Research in Health & Medicine (CCARM), and the Food Development Centre (FDC). It is thus worth emphasizing that with the addition of the Department of Human Nutritional Sciences, FAFS is now home to a continuum of expertise linking agriculture and the environment to food to nutrition and thus to health. The Faculty should therefore continue to position itself as a thought leader in the link between agriculture and personal wellness. This link is in turn mediated through the natural, applied and social sciences associated with food and nutrition. Such a leadership position is demanded of us by society in general, but is also predicated on the substantial amount of scientific and outreach infrastructure that the province of Manitoba and industry has invested in this area over the past 15 years.

*Identifiable research strengths in the Faculty supporting this theme:*

- Agribusiness Facilitating Processes (Finance, Marketing, Policy)
- Agricultural Trade and Trade Policy
- Chemistry, Post-Harvest Management and Processing of Grains/Edible Seeds
- Community Nutrition
- Economics of Nutrition Policy and Interventions
- Food and Feed Safety
- Functional Foods & Natural Health Products – Quality, Acceptability, Efficacy
- Innovation in Healthy Foods
- Metabolic Nutrition and Nutrigenomics with a Focus on Lipids

## **2. Sustainable Crop and Livestock Production Systems**

The Province recognizes that agriculture is integral to Manitoba's society, making significant contributions to our economy, rural communities and food security. Further, the Province continues to support efforts related to Green House Gas (GHG) mitigation and adaptation to climate change. The University of Manitoba's research in Sustainable Crop and Livestock Production Systems embraces not only the economic viability and competitiveness of food production in Manitoba and Canada, but also is nationally recognized for contributions made to our improved understanding of the intimate connection to the local, regional and global environment; leadership for some of these University contributions arises from multidisciplinary ventures within the Faculty, such as NCLE. A recent Thomson Reuters assessment ranked the University of Manitoba second in the U15 with respect to impact in agricultural sciences.

*Identifiable research strengths in the Faculty supporting this theme:*

- Agricultural Greenhouse Gas Monitoring & Mitigation
- Agricultural Risk Management
- Agricultural Markets and Policy
- Agronomy & Soil Ecology
- Beef-Forage Systems
- Breeding of Grains/Edible Seeds
- Economic Entomology
- Insect, Weed and Disease Pest Management
- Innovative Soil Nutrient Management
- Livestock Nutrition/Nutritional Biochemistry for Sustainable Production
- Low-Input/Organic Agriculture
- Machine-Human-Material Interactions
- Microbiome Interface for Livestock Health and the Environment
- Plant Physiology, Pathology, and Genomics
- Sustainable Animal Housing Systems

## **3. Sustainable & Healthy Bioproducts and Biomaterials**

Bioproducts is the term used to describe innovative environmentally-friendly products generated from renewable bioresources, using sustainable production practices and advanced eco-efficient conversion processes. Bioproducts encompass a wide range of products including biofuels, bioenergy, biomaterials, and biochemical and chemical feedstocks. Manitoba's Growing Green BioProducts Strategy focuses on "a sustainable and competitive bioproducts industry to diversify rural and northern Manitoba and strengthen the growth of Manitoba's bioeconomy. By 2020, Manitoba's bioproducts industry will generate \$2 billion in revenue annually, at least 80% of which comes from rural and northern Manitoba."<sup>1</sup> Five distinct bioproduct research programs have arisen in FAFS, partly as a result of the augmentation of this research strength by researchers formerly in the Department of Textile Sciences.

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<sup>1</sup> [http://www.gov.mb.ca/agriculture/pdf/the\\_manitoba\\_bioproducts\\_strategy.pdf](http://www.gov.mb.ca/agriculture/pdf/the_manitoba_bioproducts_strategy.pdf)

*Identifiable research strengths in the Faculty supporting this theme:*

- Biomaterials for Medical and Industrial Applications
- Bioprocessing of Agricultural Materials
- Bioproducts Engineering
- Oilseeds Breeding
- Sustainable Building Systems

#### **4. Land and Water Resources Management**

Land and water resources are critically important to Canadians, and their sustained use is threatened by soil erosion and sedimentation. The loss of soil degrades soil quality, diminishing the utility and value of land resources by reducing its capacity to produce food, fuel and fibre. Water is also a precious resource that most Canadians take for granted, but within our own country access to clean potable water is a challenge for some communities. Conducting research to manage both of these precious natural resources is the focus of a grand challenge posed to society, and FAFS is contributing research outcomes at an international level in certain aspects of this grand challenge. Therefore, for economic and quality of life reasons, research on land and water resources management is a critical research focus in a province with an abundance of clean fresh water and rich agricultural land wealth.

*Identifiable research strengths in the Faculty supporting this theme:*

- Soil Erosion and Sedimentation
- Economics of Water Conservation
- Land Remediation
- Water as a Human Right
- Water Quality

**Driving Discovery and Insight in FAFS as part of the University of Manitoba's Strategic Plan: Goals and Supporting Actions**

GOALS	SUPPORTING ACTIONS
<p>A. <i>Expect, recognize, support and reward high quality and innovative research and creative activities</i></p>	<ul style="list-style-type: none"> <li>i. Continue to support all of the Faculty's academics' areas of research, scholarly work, and creative activities               <ul style="list-style-type: none"> <li>• Faculty members to identify their key area of research as they see fit and build sustainable research and research training programs of their choice that drive discovery and insight within the framework of the University's Strategic Research Plan (Appendix 1)</li> </ul> </li> <li>ii. Increase the number of Industrial Research Chairs and professorships               <ul style="list-style-type: none"> <li>• A target of three by 2020</li> </ul> </li> <li>iii. Maintain support in the Faculty (with support of the Faculty of Science and VP (Research &amp; International)) the skillset of a grants facilitator to help faculty develop competitive research proposals for external funding agencies</li> <li>iv. Strategically invest in our four established areas of research excellence               <ul style="list-style-type: none"> <li>• As research funding opportunities arise, and as baseline positions become vacant, evaluate research expertise needs at the Faculty level when considering rehiring at a Department level (see Appendix 2)</li> <li>• Develop strategies to sustain major infrastructure items necessary for the Faculty's research activities (see Appendix 3)</li> </ul> </li> <li>v. Nominate researchers and scholars for national and international awards and celebrate accomplishments within the Faculty and broader communities               <ul style="list-style-type: none"> <li>• A target of six per year</li> </ul> </li> <li>vi. Encourage at Department level, the assessment and evaluation of the impacts and outcomes of research and creative activities               <ul style="list-style-type: none"> <li>• Department Heads to write one-page overview annually based on input from the Annual Activity Reviews of faculty members</li> </ul> </li> </ul>

<p><i>B. Foster meaningful and sustained collaborative research, scholarly work and other creative activities within the institution and with provincial, Canadian and global partners</i></p>	<p>i. Highlight the roles of RCFN, NCLE and CCARM as the structured means of facilitating collaborative research</p> <p>ii. Encourage faculty to participate in jointly-supervised, multi-disciplinary graduate theses</p> <ul style="list-style-type: none"> <li>• faculty members to describe in Annual Activity Reports attempts that have been made in this regard</li> </ul>
<p><i>C. Provide education and training opportunities for graduate students that recognize their diverse career paths</i></p>	<p>i. Provide discipline-specific and interdisciplinary opportunities for graduate students to explore diverse career paths</p> <ul style="list-style-type: none"> <li>• Establish in May 2016, a Steering Committee to consider holistic research training needs for FAFS graduate students</li> </ul>
<p><i>D. Foster Indigenous participation and inclusion of indigenous perspectives in research and innovation</i></p>	<p>i. Continue the Faculty's successful research partnerships with First Nations, Métis and Inuit communities and encourage other Faculty initiatives in similar partnerships</p> <ul style="list-style-type: none"> <li>• faculty members to describe in Annual Activity Report, specific attempts that have been made in this regard</li> </ul>
<p><i>E. Enhance our national and international research recognition and the quality and impact of our research, scholarly works and creative activities</i></p>	<p>i. Encourage research dissemination in high quality peer-reviewed journals, as well as through knowledge mobilization activities including expert advice and policy development</p> <p>ii. Work with Faculty communications office and University's Marketing &amp; Communications Office (MCO) to showcase research outcomes</p> <ul style="list-style-type: none"> <li>• Items from Ag E-News to be promoted to MCO on an on-going basis</li> </ul> <p>iii. Maintain FAFS support for collaborative research and other creative activities conducted by our faculty members with institutions of global standing</p> <ul style="list-style-type: none"> <li>• Faculty members to identify institutions with whom peer-reviewed publications have occurred with the information to be highlighted on FAFS webpages</li> </ul>

## **Appendix 1: Alignments with Implementation of the University's Strategic Research Plan**

**SAFE, HEALTHY, JUST AND SUSTAINABLE FOOD SYSTEMS:** The Faculty possesses the expertise to help build safe, healthy, and sustainable food systems that are economically viable and can adapt to the rapid change our province, nation and the world are experiencing today. In partnership with other academics and University agencies (eg, Office of Sustainability), we will build transdisciplinary research teams that will consolidate the University of Manitoba as an international leader in the area of safe, healthy, just and sustainable food systems. Research on improving and strengthening food systems at the University is a key component of the Faculty's commitment to research that will support sustainable and resilient communities. NCLE is expected to play a key role in linking pioneering natural and social sciences research in an integrative agricultural and food systems approach. The Faculty's expertise in a number of sustainable bioproduct themes allows the University of Manitoba to broaden the term food systems to encompass other agricultural outputs that will add to the province's Gross Domestic Product (GDP).

For well over 100 years, Manitoba and in particular Winnipeg has been the centre and heart of the growth and development of the Canadian grain "industry". In the 21<sup>st</sup> century it is home to many of the major contributors to the sustained development and health of the grains industry, albeit often in a fragmented and uncoordinated fashion. The importance of grains, oilseeds and legumes to the prosperity of western Canada drives a focus for our expertise in this area. The opportunity now presents itself to consolidate this wealth of experience and expertise and create, in Manitoba, a significant international centre of excellence in grains research, development and commercialization to the benefit of Canada, Canadians and international food and feed safety and security, through a complementary partnership between the Federal Government (AAFC), the Province of Manitoba and the University of Manitoba. Partnerships with other institutions will permit a broadening of institutional strengths in this research area, particularly those operating within the framework of the Manitoba Grain Innovation Hub.

The Grain Innovation Hub will pull together many partners to enhance Canada's research capacity for fundamental and applied research in the areas of grain crops, grain products, functional foods and feeds, natural health products, biofuels, industrial oils and other bio-products. The Hub will support: Agricultural Trade and Trade Policy, Metabolic Nutrition and Nutrigenomics with a Focus on Lipids; Functional Foods & Natural Health Products – Quality, Acceptability, Efficacy; Chemistry and Processing of Grains/Edible Seeds; Agronomy & Soil Ecology; Agricultural Markets and Policy; Economic Entomology; Breeding of Grains/Edible Seeds; Livestock Nutrition; Innovative Soil Nutrient Management; Plant Physiology, Pathology, and Genomics; Low-Input Cropping Systems; Agricultural Risk Management; Machine-Human-Material Interactions; Oilseeds Breeding; Bioprocessing of Agricultural Materials, and Bioproducts Engineering. The FAFS is unique in North America for the expertise, infrastructure and research conducted at the Canadian Wheat Board Centre for Grain Storage Research (CWBCGSR). Expertise in storage of grains, mathematical modeling of stored-grain ecosystems, grain drying, and digital image processing for grading and automation of processing operations in grain handling facilities is essential to the Grain Innovation Hub, and, as such, acquisition of an Industrial Research Chair (IRC) in Stored-Grain Ecosystems is a Faculty priority.



**SUSTAINABLE WATER MANAGEMENT SYSTEMS:** The Faculty's expertise in the management of water quantity and quality at the regional-, watershed-, and farm-scales is contributing to the long-term sustainability of our land, rivers, and lakes. Researchers are generating new knowledge and technology critical to Manitoba's agricultural, energy and fishing sectors, community development and sensitive ecosystems with the support of government and industry.

Water resources in Canada and Manitoba play a crucial role in driving the economy, advancing social welfare and quality of life. Water is critical to the success of production agriculture and food manufacturing. Nutrient enrichment of land and water from agricultural practices is a concern for many in the agricultural industry. Solutions need to be found and evaluated to allow the agricultural industry to continue to thrive. The Faculty, along with researchers in the Clayton H Riddell Faculty of the Environment, Earth and Resources (CHRFEER), currently has good supporting expertise and infrastructure to undertake research that will allow us to tackle these research challenges. Expertise in Land Remediation is helping the linkage between land and water to flourish. Additional critical expertise in the area of Soil and Water Conservation would consolidate the linkage of land and water stewardship. Land and water stewardship are priority areas for both provincial and federal governments, and the University of Manitoba will be well positioned to bring together expertise and to train high-quality personnel so that society can effectively adapt to a changing climate with weather extremes and water excesses and deficiencies.

**HIGH PERFORMANCE MATERIALS, STRUCTURES AND PROCESSES:** The Faculty's strengths in biomaterials and bioprocessing, particularly with respect to medical textiles and agricultural fibres, are notable components in the University's progress on this research theme. Further development of expertise within the framework of the University's Manitoba Institute of Materials will ensure that FAFS research contributes strongly to this theme. External partnerships (such as with the Composites Innovation Centre), are key drivers for such activities, but the Government of Manitoba's *Bioproducts Strategy* emphasizes the strategic importance of this sector to Manitoba's economic growth, environmental sustainability and rural and northern diversification. For this reason, University and FAFS engagement in the biomaterials and bioprocessing areas is a research priority.

**INTEGRATIVE RESEARCH IN HEALTH AND WELL-BEING:** Although not acknowledged as such in the University's Strategic Research Plan, FAFS researchers are addressing research questions that are relevant to the health and well-being of Manitobans. Much of the Faculty's research in this area is focused on nutritional means of preventive healthcare in order that recommendations for disease prevention strategies can be proposed, in contrast to disease treatment strategies that have lesser potential to improve the long-term quality of life prospects of Manitoba's population.

**CROSS-CUTTING RESEARCH THEME, INDIGENOUS RESEARCH:** Fostering the inclusion of Indigenous perspectives in research and advancing indigenous research are two goals of the University's Strategic Plan. The Faculty of Agricultural & Food Sciences has a number of research strengths that allow the Faculty to contribute to the University's stature in this particular cross-cutting research theme. Food and nutritional

security issues confront rural, Northern and urban Indigenous peoples, demanding research initiatives from FAFS and the University to address these challenges. The Faculty's on-going emphasis on research evaluating innovative greenhouse designs is one means of providing sustainable solutions for food production in Northern communities. For urban communities, expertise in nutrition literacy can help to improve the quality of life of Indigenous peoples. The potential to augment this expertise with a Tier II Canada Research Chair (CRC) in the area of *Nutritional Security and Non-Communicable Disease Risk in Indigenous Populations* would not only further consolidate Faculty expertise in the area of nutritional security, but would also contribute to the University's impact in the research theme "Integrative Research in Health and Well-Being". Faculty expertise in agricultural, food and nutritional sciences is also an essential skillset that can assist in the economic empowerment of Indigenous communities and businesses operated by Indigenous entrepreneurs; a number of such research projects are already underway in the Faculty. Greater impact in this area is foreseen as a result of NCLE initiatives with researchers in the Natural Resources Institute focused on community-based food system innovations. Marshalling FAFS expertise in water quality and its safety alongside that of researchers in CHRFEER and collaborators in the Faculties of Engineering and Science is also a shared commitment to research supporting Indigenous communities. The University's NSERC CREATE project is a notable impact, which is driving multi-disciplinary research and research training efforts targeting attainment of water and sanitation security in First Nations communities.

## **Appendix 2: Maintaining A Critical Mass of Researchers**

### *Safe, Nutritious and Healthy Food*

The research team boasts two Canada Research Chairs and 27 other FAFS academics. In the foreseeable future, eight baseline positions in this area will need to be renewed (five in the area of Chemistry and Processing of Grains/Edible Seeds, two in Metabolic Nutrition and Nutrigenomics with a Focus on Lipids, and one in Food and Feed Safety). The present average institutional costs income from these positions is \$12,000 per person per year.

### *Sustainable Crop and Livestock Production Systems*

The research team boasts one Canada Research Chair and 42 other FAFS academics. In the foreseeable future, nine baseline positions in this area will need to be renewed (two in the area of Agricultural Risk Management, two in Agronomy & Soil Ecology, two in Nutritional Biochemistry for Animal Production, one in Beef-Forage Systems, one in Agricultural Markets and Policy, and one in Agricultural Greenhouse Gas Monitoring & Mitigation). The present average institutional costs income from these positions is \$31,000 per person per year.

### *Sustainable & Healthy Bioproducts and Biomaterials*

The research team boasts one Canada Research Chair (currently being applied for), and 7 other FAFS academics. In the foreseeable future, two baseline positions in this area will need to be renewed (Bioproducts Engineering and Sustainable Building Systems). The present average institutional costs income from these positions is \$89,000 per person per year.

### *Land and Water Resources Management*

The research team boasts two Research Chairs. In the foreseeable future, no hires for renewal in this area are expected. Nevertheless, given the importance of this area to the University's progress in Human Rights research, the consolidation of this area with an additional baseline position may be feasible.

### **Appendix 3: Sustaining Major Infrastructure**

It is important that the Faculty of Agricultural and Food Sciences has a defined implementation plan for maintaining, and growing, its major research infrastructure items that allow research in the four research priorities to be accomplished. The implementation plan will identify strategies for on-going renewal of this infrastructure. The following is a list of research infrastructure used to address two or more of the research priorities above:

Alternative Building Site

*Operating funds currently secured from researcher grants*

Animal Holding Facility in Biological Sciences

*Partial technician support from Department of Human Nutritional Sciences; additional operating funds currently secured from researcher grants*

Crop Technology Centre

*Operating funds currently secured from researcher grants*

CWB Grain Storage Research Facility

*Operating funds currently secured from researcher grants; substantial support being sought through an Industrial Research Chair*

Dairy Processing Facility

*Partial technician support from Department of Food Science; additional operating funds currently secured from technical service agreement and grants*

Endowment Lands (Waverley)

*Operating funds currently secured from researcher grants*

Field Plots across Pembina Highway

*Operating funds currently secured from researcher grants*

Field Plots at the Stadium

*Operating funds currently secured from researcher grants*

George Weston Sensory Lab

*Operating funds currently secured from researcher grants*

Glenlea Research Station

Weather Station

Ruminant Unit

Swine Unit

Field Operations

Organic Plots

NCLE Plots

Greenhouse Gas (GHG) Monitoring Facilities

NCLE Off-site Barn

ByProducts Processing Facility

*Revitalization currently under consideration by FAFS Steering Committee (Scanlon/Gilson)*

Ian N. Morrison Research Farm, Carman and Region Facility

Operating funds currently secured from researcher grants

J.B. Wallis/R.E. Roughley Museum of Entomology

Upgrades enabled through a number of CFI grants

Landscape Dynamics Laboratories

Upgrades enabled through a number of CFI grants and Operating funds secured from researcher grants

Pilot Plant Facilities in Food Science

Operating funds currently secured from Department of Food Science

Poultry Facility

Revitalization currently under consideration by FAFS Steering Committee (Scanlon/Gilson)

RCFFN

Long-term plans for operating funds currently being negotiated between Dean (FAFS) and University of Manitoba VP(Research & International)

The Greenhouse

The Greenhouse is updated on an on-going basis with funding from Tri-Council Indirect Costs Program and from royalties generated by researchers in the Department of Plant Science

The "Point" Field Research Laboratory

- Field Equipment Sheds
- Seed Processing Facility
- Weather Station
- Field Plots
- Apiary and Associated Facility
- Horticulture Storage Facilities

Seed processing facilities will be upgraded using funds from donors, as well as from royalties generated from the sale of plant varieties developed by researchers in the Department of Plant Science; operating funds for other facilities currently secured from researcher grants

T. K. Cheung Centre for Animal Science Research & Small Animal Holding Rooms

Supported by operating funds from an endowment fund and from researcher grants