

**ONTARIO MINISTRY OF AGRICULTURE,
FOOD AND RURAL AFFAIRS**

/ UNIVERSITY OF GUELPH

AGREEMENT

**CONSOLIDATED ANNUAL REPORT
2008/2009**

September 30, 2009

Table of Contents

Preamble - The OMAFRA –UofG Agreement Renewal and Rationale.....	3
Executive Summary	5
Accomplishments	6
Program Highlights and Case Studies	9
Agriculture and Food Laboratory	9
Animal Health Laboratory.....	11
Research	13
Veterinary Clinical Education Program.....	38
The OMAFRA/UofG Partnership Financial Report.....	40
Performance Reports.....	47
Overall Agreement Performance Report.....	49
Program Performance Reports	56
Agriculture and Food Laboratory	56
Animal Health Laboratory.....	62
Research	76
Veterinary Clinical Education Program.....	107
New Initiatives	113
Knowledge Translation and Transfer (KTT) Program and Partnership.....	113
Highly Qualified Personnel Program (HQP)	118
AHSI Annual Progress Report	120
Veterinary Clinical Education Program	122
Other Reporting.....	125
Livestock Inventories	125
University of Guelph/ OMAFRA Equipment Inventory & Library Resources	126
Proof of Principle Program.....	127
Agriculture and Food Laboratory – Schedule G	128
Appendix A	129
SPARK Research Stories with OMAFRA Sponsorship 2008/09	129
Appendix B	137
OMAFRA/UofG Audited Statement of Revenues and Expenses.....	137

OMAFRA / U of G Partnership Consolidated Annual Report 2008 / 2009

PREAMBLE - THE OMAFRA –UoFG AGREEMENT RENEWAL AND RATIONALE

On April 1, 2008 the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) and the University of Guelph announced a new, ten year agreement for the delivery of the province's priorities in agri-food and rural research, animal health and food testing laboratory services, and veterinary education. Under the agreement, the university would receive \$300 million over five years, and an additional one-time payment of \$56 million announced in the 2008 Ontario Budget for new initiatives in such areas as public health, knowledge translation and transfer, graduate student development and research in seven new theme areas.

The 2008-2018 agreement builds on the foundation of over a century of shared support for agri-food and rural research and innovation. This long-term provincial funding has produced specialized expertise and facilities at the U of G designed specifically to meet OMAFRA's core business requirements.

The funding of the new agreement restores human and physical capacity diminished over the past decade by fiscal pressures, and improves accountability with joint OMAFRA and U of G governance and clearly defined performance indicators.

Most importantly, it encourages faster, more effective use of the new knowledge generated - by industry, policy makers and other stakeholders. Research investment has been more than doubled in emerging and transformative areas such as bioproducts and emergency management.

In 2007 Deloitte completed a report entitled, "University of Guelph/OMAFRA Impact Study." It found that OMAFRA's investment of \$54 million annually from 1996 to 2007 (under the previous OMAFRA – U of G agreement) generated more than \$1 billion annually in returns.

The report provided many examples of benefits flowing from the agreement; the current \$650 million Ontario soybean market built on 25 years of research, DHA enriched milk and Omega-3 and lutein-enriched eggs. It noted that equally important but more difficult to quantify is the value of veterinary training and laboratory capability that protect Ontario's consumers and reputation for safe, quality food products in international markets.

Maximum return on the investment provided by this agreement continues to be the priority for both OMAFRA and the U of G. This first annual report (2008-2009) of the new agreement makes clear the win-win it offers both parties. OMAFRA reaps the benefits of the additional research money it leverages, and the university continues to attract leading researchers because of the leveraging opportunities based on the OMAFRA investment.

2008-09 has been a productive year of transition. All governance structures, performance indicators and programs have been implemented and valuable new knowledge is being transferred to key audiences via intensive communication efforts. There is enthusiasm and recognition of the tremendous benefits this agreement offers not only for both partners, but for all citizens of Ontario.

EXECUTIVE SUMMARY

This Annual Report is being submitted to the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) in accordance with the terms and commitments under the OMAFRA/University of Guelph (UofG) Agreement. This is the first Annual Report under the current Agreement between the University of Guelph and OMAFRA, which was signed April 1st, 2008.

The University has complied with all material provisions of the Agreement and is managing the transfer payment funds provided under the Agreement effectively and efficiently and with due regard to obtaining appropriate value for money expended.

The period covered by this Annual Report is the UofG's 2008/09 fiscal year (May 1, 2008 – April 30, 2009). This report covers the activities, budgets, expenditures and performance measures for each of the four program areas encompassed by the Agreement – Research, Veterinary Clinical Education Program (VCEP), Animal Health Laboratory (AHL) and the Agriculture and Food Laboratory (AFL).

Overall Agreement

Communications has been identified as a crucial part of the new Agreement. Highlights of communications initiatives for 2008/09 were the start of an electronic Partnership Newsletter called *The Buzz*, the News@Noon series and the Affiliated Researcher Program. Partnership research had continued support from the Students Promoting Awareness of Research Knowledge (SPARK) program through print and broadcast stories. SPARK AIR branched out to include videos, with students travelling to many research stations to promote Partnership research across the province. As well, the first Partnership Agri-Food Yearbook edition of *Research Magazine* was produced. Owen Roberts, Director of Research Communications, has been seconded part-time to help deliver on the communications plan which was approved by the Executive Committee during the 2008/09 year.

As well as holding an event to thank those who worked on the negotiations of the new Agreement, there were two other events at which both the OMAFRA Deputy Minister, and the UofG President attended – the launch of the Agreement on April 29, 2008 and a Partnership Dialogue which took place on October 6, 2008.

In order to document the accomplishments and outcomes of the Agreement, a series of 39 Performance Indicators (PIs) were developed, some for the overall Agreement and several for each of the four Programs operated under the Agreement – Research, Agriculture and Food Laboratory (AFL), Animal Health Laboratory (AHL), and the Veterinary Clinical Education Program (VCEP). Many of these PIs are new, and consequently, several new methodologies for compiling the data needed to be established in this first year of the renewed Agreement. For each of the 39 PIs, baselines were established based on performance levels under the previous Agreement where comparative data was available, or in a few cases, will be established using the 2008/09 results. Targets for years two through five of the Agreement were also established wherever possible. In some cases, neither baselines nor targets are applicable, for example where the PI is based on case studies or qualitative information. All PIs are reported on in greater detail later in this report.

Accomplishments

New Programs

Two new programs were identified in the new Agreement and funded by new initiatives money: Knowledge Translation and Transfer (KTT) and Highly Qualified Personnel (HQP). During 2008/09 both programs were developed and had milestones met including planning for hiring KTT staff and creating a work plan - and announcing a faculty Coordinator for the HQP program.

Research

The Research Program began with seven new research themes – Agricultural and Rural Policy, Bioeconomy – Industrial Uses, Emergency Management, Environmental Sustainability, Food for Health, Product Development and Enhancement through the Value Chains and Production Systems. During 2008/09 Director Champions (DCs) from OMAFRA were identified, and the University of Guelph held a rigorous search system to place Research Program Directors (RPDs). Eight RPDs were appointed, one for each Theme except Production Systems which has two – one for livestock, and one for crops.

Continuing projects from the previous Agreement were placed into the new themes, and highlights and case studies from each theme follow later in this report. Achievements from the 2008/09 research program include helping Ontarians buy local food, helping the auto industry become more 'green', developing a vaccine against avian influenza, dealing with ammonia in intensive farm operations, helping to regulate blood sugar levels with bread, creating less expensive antibody production, breeding for better pork products and creating a local supply of hazelnuts for a chocolate production company.

A call for new proposals was issued in March, 2009 due in May, 2009. As a testament to the reengagement of UofG faculty during the renegotiations process, an unprecedented 130 proposals were received – 40 of them applying across themes. Proposals were reviewed for scientific merit by up to three peers from other universities, and were also rated by review committees Chaired by the RPD and consisting of representatives of the research and academic community (UofG, other research institutions and universities), OMAFRA and other government ministries/departments, and industry or sector representatives. Of the 130 proposals, 65 were funded for 2009/10 and will be reported on in next year's annual report.

Commercialization and licensing of the research coming out of the OMAFRA/UofG Agreement is reported on by the Business Development Office (BDO) who for 2008/09 report 364 disclosures, 9 patents filed, 17 licenses granted and 5 patents issued – with a total licenses revenue for OMAFRA supported research of \$1,340,583. Recognizing the importance of the Agreement, the BDO has also dedicated a staff position to the Agreement who will be the commercialization lead for the KTT program.

The BDO is taking measures to increase outreach to researchers and industry, and staff attended several conferences and networking sessions, including presenting the Enviropig™ technology at the World's Best Technology (WBT) conference in Texas.

A new collective agreement with the University of Guelph Faculty Association (UGFA) means a new inventor-owned IP policy for UofG faculty. However, IP within the OMAFRA/UofG Agreement is an exception to this policy and ownership remains with the University.

The Proof of Principle fund was launched and two projects were granted funding within it -- one to do with health benefits of mint, and one looking at genetic markers to create more marketable pig lines.

A search is underway for a new Director which should be completed by fall 2009. Sue Bennett has been interim Director since December 2008.

Veterinary Clinical Education Program

The Veterinary Clinical Education Program (VCEP) continued to provide funding for the Veterinary Teaching Hospital, advanced clinical training, an externship and a one-year Veterinary Internship Program through the Ontario Veterinary College (OVC). Highlights from the program include OVC achieving full accreditation from the AVMA/CVMA. Part of achieving this accreditation, and also a requirement of the CCAC, is to build a facility to house teaching animals separately from the hospital patients. The Board of Governors has approved the design for this building and an architectural firm has been hired. Construction is to begin in October 2009.

OVC's veterinary students continued the long-standing tradition of achieving a very high success rate on the licensing exam resulting in a high rate of post-graduate employment and very high employer satisfaction with our new graduates.

Under the new Agreement the VCEP Program received funding for new initiatives to train graduates in veterinary public health and zoonotic diseases, and to address the need for large animal veterinarians in remote areas. In May 2008 the University of Guelph Centre for Public Health and Zoonoses (CPHAZ) was officially launched, and during the 2008/09 year the new Masters in Public Health (MPH) was approved. Fourteen full-time and two part-time students were accepted into the program starting in the fall of 2009.

A working group is working on developing a proposal related to the implementation of a plan for the delivering of both a Rural Veterinary Track and a comprehensive Food Animal Track within the final year of the DVM Curriculum. A second working group has been established to determine the learning objectives and operational plan for an equine primary care rotation.

Laboratory Services

The Animal Health Laboratory (AHL) and the Agriculture and Food Laboratory (AFL) report separately in the annual report under the new Agreement. Another change at Laboratory Services was the elimination of the Laboratory Services Managing Director position. Responsibilities of the position were split and assigned to two existing positions (Director, Animal Health Laboratory and Director, Agriculture and Food Laboratory, each also assigned the title of Co-Executive Directors of the LSD).

Agriculture and Food Laboratory

During the last quarter of the 2008/09 fiscal year, the AFL undertook a reorganization of its existing lab management structure. Four new laboratory units were created (Chemistry, Analytical Biology, Diagnostics, and Method Development) which better reflects the specific nature of the analytical services provided to clients including OMAFRA.

Laboratory Services has been working this past year towards changing its approach to securing new business opportunities and increasing external revenues for reinvestment (per Schedule "F" of the Agreement). The two-phase initiative will be completed within the 2009/10 fiscal year.

The AFL continues to offer a high level of service to clients in agriculture, food and beverage, corporate and research sectors. In 2008/09 the AFL developed a new multiple residue methodology for veterinary drugs, continued to provide valuable support to the Plum Pox Virus eradication program, provided quick and comprehensive results when Pigeon King declared bankruptcy and was chosen as the Ontario dairy industry's preferred laboratory of choice.

Animal Health Laboratory

AHL continued to offer a wide spectrum of tests, with addition/replacement of improved tests over time as enhanced through the Animal Health Strategic Investment (AHSI). There were many highlights over the 2008/09 year, some of which included an overall satisfaction rating of 94% with clients, the AHL ensured testing needs would be met as part of the novel H1N1 outbreak at the end of 2008/09 and the AHL received a five year accreditation from the American Association of Veterinary Laboratory Diagnosticians (AAVLD).

The AHL also launched the Animal Health Strategic Investment (AHSI), with new initiative funding. Several initiatives and projects were introduced supporting the three key pillars of the initiative which are new tests for emerging diseases, baseline surveillance for the early detection of emerging hazards and the development and testing of emergency and business continuity plans for the AHL.

Program Highlights and Case Studies

Agriculture and Food Laboratory

New Multiple Residue Methodology for Veterinary Drugs

In response to technical issues with commercial CHARM kits that resulted in higher than acceptable rates of false positive screening test results for aminoglycoside and macrolide drug residues, the Agriculture and Food Laboratory set out to develop a method that would reduce or even eliminate this issue. In turn, the reduced number of false positive results would mean that fewer samples would require more time-consuming (and expensive) confirmation testing.

The ultimate goal of this initiative was to reduce the number of carcasses that were being (unnecessarily) held at provincially-inspected abattoirs pending confirmatory drug testing. In order to accomplish this objective, the specificity of screening tests had to be improved. The end result was the development of a drug residue method for animal tissues that covered a large number of drug classes, and where false positive rates for aminoglycosides and macrolides dropped to zero.

Dr. Perry Martos and his team were able to recover 41 individual drug compounds through a multi-residue screening method using Liquid Chromatography coupled with Mass Spectrometry (LC-MS/MS). This represents a significant achievement in that multi-class, multi-residue drug methods available in the current scientific literature still do not include the wide range of drugs covered by the AFL's method, in particular the aminoglycosides.

To date, extensions of this method have been used in at least three OMAFRA pilot studies since early 2008. The AFL continues to work closely with members of OMAFRA's Meat Inspection Program and Food Safety Science Unit to ensure that the on-going development of this scientific approach targets the appropriate program priorities in a timely fashion. Furthermore, a collaborative strategy has been developed to ensure that this analytical approach will be accepted by various major North American regulatory bodies outside of OMAFRA, including the CFIA and the USDA.

Plum Pox Virus Eradication Program

The Agriculture and Food Laboratory has served as the analytical test facility in support of the federal program to eradicate Plum Pox Virus (PPV) in the Niagara region of Ontario since 2001. This program has uniquely combined the collective resources and support from the University of Guelph, Agricorp, and OMAFRA in delivering this high-value service to the Canadian Food Inspection Agency. The laboratory's ability to scale up for the huge testing volumes associated with an eradication program of this nature is virtually unmatched. Given the success of the sampling and testing program to date, this combined approach serves as a model for future plant disease eradication programs around the world.

The AFL hired approximately 90 students to analyze 690,000 samples during a 16-week period during the spring/summer of 2008. One of the major challenges in a project of this magnitude and importance is to create processes that allow the lab to utilize university students, while maintaining a high level of quality assurance around the results. The creative approaches to workflow design, training, and quality control that have been put in place have resulted in the AFL's ability to achieve the lofty six sigma quality standard – or less than 3.4 errors per one

million tests performed – four consecutive times over the past eight years. With over four million samples now having been processed, the multiple six sigma ratings represent a truly monumental achievement.

During the first few years of the PPV program, thousands of samples were found to be positive for the disease. In response to these findings, the federal government mandated the removal of many orchards within the province. Fortunately, the on-going testing and eradication efforts have resulted in a significant decrease in the number of positive samples, down to 261 in 2007 and only 131 in 2008. This is indeed welcome news for the Ontario stone fruit industry, as the eradication program appears to be working.

Raw Milk Testing Contract

The Agriculture and Food Laboratory has historically provided both analytical and program management support for the collection, testing and reporting of results for raw milk composition and quality program samples in Ontario. In 2008, the dairy industry moved to tender milk composition testing with the intention of also assuming responsibility for sample collection and data management within the province.

The AFL has been working in collaboration with both the Ontario dairy industry and OMAFRA to work out some of the details of the new agreement.

Leverage Laboratory Capacity for Reinvestment

Laboratory Services has been working this past year towards changing its approach to securing new business opportunities and increasing external revenues for reinvestment (per Schedule “F” of the Agreement). The Division requires a reinvestment of approximately \$1.5M to \$2.0M into equipment, building infrastructure and new capabilities each and every year. Various large on-going and one-time projects have provided significant reinvestment funds over the years, but these sources of external revenue have finite life-spans and as such need to be replaced.

The first phase of this new approach involves the recruitment of a marketing director with proven business development planning and execution skills. This new approach will involve more rigorous analysis of new niche market opportunities, along with strategies that allow Laboratory Services to penetrate deeper into its existing markets.

The second phase of this initiative will focus on a realignment of current business development resources in taking a more marketing-driven approach to growing external revenues. New and improved business processes will need to be implemented in order to support the changes necessary to move in this direction. This phase will also require a significant cultural shift within the organization, which will need to be guided and managed through on-going training for and communication with all Laboratory Services staff.

As of the end of the 2008/09 fiscal year, Laboratory Services was nearing the end of the recruitment process. It is expected that the first two phases of this on-going initiative will be completed within the 2009/10 fiscal year.

Case Study

Emergency Response – Pigeon King

When Pigeon King International of Waterloo, Ontario declared bankruptcy in June 2008, hundreds of Ontario farmers were left with thousands of birds. Given that the market for these birds had not been previously established, there was no mechanism in place to determine whether the pigeons were fit for human consumption. The company had contracts with about 1,000 breeders in Canada and United States, most keen on quickly selling their flocks.

The birds needed to be declared safe of antibiotic residues before going to processing plants and being sold for food. Ontario was therefore faced with a potential food safety situation.

The Agriculture and Food Laboratory was immediately called upon to develop a testing protocol for pigeon tissue that, until now, didn't exist anywhere in the world. The laboratory scientists acted quickly and in two weeks developed and validated a comprehensive approach using multi-residue drug screening methods and advanced instrumentation. This mass spectrometry-based testing proved to be a scientifically sound and rapid way to detect 20-plus drugs at the same time.

Furthermore, the tests were more sensitive, faster and fewer solvents were needed in sample preparation reducing the environmental impact. With this method developed, the AFL is looking to use this quick and efficient process for other poultry and livestock commodities to ensure optimum food safety in Ontario.

Animal Health Laboratory

Policy

- The strategic Vision and Mission were renewed for Lab Services Division in 2008/09 as follows:

Vision:

We will be a laboratory partner of choice for government and universities in Canada, for agriculture, food safety, and animal health testing. We will also be a leader in providing high-value laboratory services to the private sector in selected niche markets.

Mission:

Working together toward a healthier future ... we provide high-value analytical and diagnostic services for the agricultural, food and veterinary sectors.

Infrastructure

- The Laboratory Services Managing Director position was eliminated and its responsibilities were split and assigned to two existing positions (Director, Animal Health Laboratory and Director, Agriculture and Food Laboratory, each also assigned the title of Co-Executive Directors of the LSD).
- Significant progress was made in 2008/09 on the new building that will house the AHL and the OVC Department of Pathobiology. The project is on schedule and on budget. Site preparation was completed in the summer of 2008, and building began in the fall of 2008, with occupancy targeted for August 2010. As well, tenders have gone out for an alkaline tissue digester to provide on-site disposal of animal anatomical waste for the

necropsy suite. Site visits are being planned to other facilities with operating digesters to confirm functionality and operating details. A decision will be made on which digester to purchase in fall 2009.

- AHL veterinarians were included in the new University of Guelph Faculty Association as Veterinarian members, and provided with enhanced compensation. This is anticipated to ensure maintenance of a full complement of highly trained veterinary specialists.

Operations

- AHL continued to offer a wide spectrum of tests, with addition/replacement of improved tests over time as enhanced through the Animal Health Strategic Investment (AHSI), e.g., real-time PCR to replace gel-based PCR tests. The following is a list of new tests offered by the AHL in 2008/09:

SOP #	SOP Name
BAC-022	BIOMIC-Automated reading of disk diffusion susceptibility tests
CLP-594	cobas®6000 c501 analyzer
CLP-595	GammaCoat™ Free T4 (Two-Step) 125I RIA kit
CLP-596	Canine Pancreatic Lipase test kit - Canine Snap cPL
CLP-597	Determination of DEA 1.1 antigen using the DiaMed VET Gel ID system
CLP-EN-050	Plasma ACTH
CLP-EN-055	Canine TLi Trypsin-like Immunoreactivity in Canines/Trypsin-like immunoreactivity in Canines
IAV-AV303	Egg Candling
MOL-201	Tritrichomonas foetus PCR
MOL-206	Swine influenza virus real-time RT-PCR (AHL)
MOL-208	Coxiella burnetii Real-Time PCR
SNL-035	Ammonium, nitrate and nitrite in soil, plant, water, biosolids, manures and wastes
SNL-057	Nitrate-N & Nitrite-N in drinking and surface waters, and domestic and industrial wastes (AQ2 method no: EPA-114-A Rev. 5)
TOXI-069	ICP-MS analysis of silver in serum and plasma

- The AHL performed approximately 706,000 (versus 691,000 in 2007/08) procedures (one or more test per procedure) in support of disease surveillance.
- The annual AHL client satisfaction survey was conducted electronically this year, with input on questions from OMAFRA, and results demonstrated an overall satisfaction rating of 94%.
- The AHL published approximately 50 articles in the AHL quarterly newsletters in 2008/09. As well, AHL veterinarians were involved in 14 oral or poster presentations and 22 peer-reviewed publications in calendar year 2008.
- The AHL informed OMAFRA of all (approximately 100) reportable or notifiable disease events that were suspected and/or confirmed by the AHL in Ontario in 2008/09, ranging from anthrax through influenza, and participated in the investigation of various disease outbreaks.

- The 2009 novel H1N1 Influenza virus pandemic was in its earliest stages at the end of 2008/09, and the AHL ensured that all testing needs would be met as a member in the Canadian Animal Health Surveillance Network.
- The American Association of Veterinary Laboratory Diagnosticians (AAVLD) audited the AHL in April 2009; as a result of this audit, the AHL received full AAVLD accreditation for 5 years.
- In a separately funded initiative, the AHL received \$450K late in the 2007/08 fiscal year for an autogenous viral vaccine capacity initiative, and the feasibility and engineering study was completed by the end of 2008/09. The projected funds needed exceed the funds available, and other options are being investigated.
- The new Animal Health Strategic Investment (\$1.5M/yr for 5 yrs) was launched, funding several initiatives and projects targeted to support the 3 key pillars of the initiative:
 - new tests for emerging diseases;
 - baseline surveillance for the early detection of emerging hazards; and
 - development and testing of emergency and business continuity plans for the Animal Health Laboratory.

Research

Agricultural and Rural Policy

The OMAFRA/University of Guelph Partnership supports research in this theme so that government can provide support to Ontario's agrifood industry and rural communities. Agricultural policy research encompasses many issues related to farming, including agricultural trade and marketing, business and finance, and innovation in economic development. Rural policy research focuses on the challenges and opportunities facing rural Ontario, including current government policies and programs, the impact of climate change, regional development, rural infrastructure, transportation and rural labour markets. Together, agricultural and rural policy research will provide up-to-date, factual information for government decision makers.

Highlights from the program this year include:

- Researchers at the School of Environmental Design and Rural Development are conducting province-wide interviews to assist the province in creating a strategic vision for local food, contributing to improved capacity, infrastructure and improved policies and programs. (Landman, #026609)
- Horse farms are one of the least understood forms of agriculture in Southern Ontario, and yet from an economic development perspective, they bring a multitude of benefits. Researchers are analyzing the farms' role in the urban-rural fringe areas of Southern Ontario as an opportunity that can create employment, encourage investment and protect the rural landscape. (Caldwell, #026610)
- Ontario's growing cultural diversity has produced strong demand for ethno-cultural food products and local production. A pilot project by researchers in the Department of Geography and Centre for Land and Water Stewardship is exploring the potential of

Canadians to engage this challenge through new farm starts and new market development. (Smithers, #026519)

- Understanding and anticipating change in rural areas is essential for implementing effective policy about rural and urbanizing areas. A recent study examined urban-rural relationships in municipalities across Southern Ontario where distance measurement data was reviewed and generated to assess how the distance from Ontario municipalities to the closest urban area changes over time. The research has implications for property rights and ownership in terms of gains and losses of rural and urban property ownership in Ontario. A map of these measurements can be found here: <http://fare.uoguelph.ca/projects/urban-pressure-spatial-measures>. (Deaton, #026608)
- From a global perspective, Canada's pork industry has done extremely well by expanding into several new markets such as Russia, South Korea, Taiwan, and China. At the national level, Canada exports over 62% of total production. Given this backdrop, Ontario researchers have been developing a hog pricing formula for pork to be exported to China. It is expected that over the next few years, China will dramatically increase pig imports driven mainly by increased consumption as income levels improve and lower production values caused by disease challenges. The Ontario industry is facing some significant challenges in the next two years including uncertain commodity prices, relatively high costs of production, reduced live animal trade with the United States caused by Country of Origin Labeling and the restructuring of Maple Leaf Foods. As stakeholders in the Ontario industry, producers are looking at marketing alternatives such as China to provide price stability, and the Chinese are interested in Ontario because of the province's relatively large sow base, high levels of productivity, and historical good trade relations between the two countries. (McEwan, #026532)
- Researchers are confident supply managed industries can compete in a less distorted world if given time to prepare and an encouraging policy environment. Post-Doha Development Agenda multilateral trade negotiations will likely require substantial changes to supply management policy, including significant price declines and Canada now has a window of at least fifteen years to prepare for these possible changes. The team has examined a variety of options, and made recommendations for adjustment of the industry so it can successfully compete when global tariff reductions are more fully applied to price sensitive products. (Meilke, #026528)
- There are limits to what a medium-sized trading country, like Canada can accomplish in influencing the future shape of the agricultural trading system. Canadian agricultural policy-makers have a challenge to position Canada so that it can fully exploit this potential – a task which will require a comprehensive and credible negotiating position on agriculture. Researchers have found that for Canada, a rules-based, more open and less distorted multilateral trading system should continue to be an overriding goal as it provides the best opportunity for ensuring a more sustainable, more competitive agricultural economy for all regions of Canada. (Meilke, #026528)

Case Study

Donald Reid, Rural Planning and Development

#026525: Policy alternatives for severely reducing or eradicating poverty in rural Canada.
April, 2007 – August, 2009

(up to and including 08/09)

OMAFRA / UofG Research Project Operating	\$26,000
Faculty/CARG FTE	\$53,153
Research Station Use	-
Tech/Admin Support and Indirect Costs	\$38, 907
Total OMAFRA / UofG Project Value	\$ 118,060
Partner/In Kind Contributions	-
Collaborators	-

While there has been substantial research completed on the rural poor this research has not been translated into policies and programs that attempt to severely reduce or eradicate poverty and the social marginalization of the poor. As the Canadian Senate Committee on Agriculture and Forestry studying poverty in their recent publication *Understanding Freefall: The Challenge of the Rural Poor*, suggest, "Canada's rural poor have rarely been the subject of political attention." Governments and society have focused much attention on policy mechanisms such as local economic development with some hope of eliminating poverty by the so called trickle-down theory of wealth creation. While this focus has merit, there are some rural dwellers that have been unable to benefit from this single approach because of social and personal limitations. Although much rural poverty tends to be invisible, in previous work this research team has uncovered people living in intolerable living conditions in rural areas.

This project focused on the supply side of the issue, particularly policy development. As a result, this project concentrated on the plight of the poverty stricken and marginalized in rural areas and the required policy on eradicating or severely reducing their intolerable situation.

Previous research conducted by this team and others concluded that while it is a major factor, reducing poverty is not simply a matter of increasing income. Additional considerations defining poverty in rural areas are lack of transportation, physical and mental health, low education levels and exposure to poverty over generations. These result in transience, violence, crime, inadequate housing, social marginalization and low self-esteem. Additionally, it was found that poverty rates in Ontario and across the country are increasing, particularly if the growing gap between those who have wealth and those who don't is used as an indicator.

The results of 2008/09 phase of the project lie in two distinct yet related areas: the determination of the breadth of innovative policy options generated by government and non-governmental agencies (NGO's) to deal with poverty reduction and eradication for their constituents, and the determination of what mechanisms are required for governments and NGO's to adapt to these new and innovative ways of addressing this issue.

This phase of the research project was accomplished through a continuing literature search on poverty and marginalization, a secondary analysis of existing data bases produced by previous research for policy implications and a search of literature from allied and non-allied disciplines to determine how adaptation and transformation of environments, organisms and social organizations is conceived. Additionally websites and documents of government and non-governments were searched and analyzed to determine current, unique and best practices in dealing with poverty.

A survey of governmental and non-governmental agency practices was accomplished through analyzing agency web sites and documents to determine what initiatives are being implemented, and seem successful, to deal with the issue of poverty reduction. This work identified and studied 12 institutions and organizations from across Canada that are attempting to deal with these issues in an interesting and unique way. These agencies and institutions ranged in scale from local community based agencies to national institutions. Some are well known to researchers, practitioners and the general public and some are much more obscure.

From this research come several fundamental foundations that will need to be employed by those advocating for, or creating policy for, poverty reduction or eradication:

- Advocates and rural communities will continually need to make the argument that in an affluent Canada there is no place for poverty.
- Government officials need to replace the philosophy of 'Workfare' (this is the program we have in Ontario known as 'Ontario Works where people on welfare are required to either work or be enrolled in a training program) with a policy stressing a pluralistic approach to life-style and broaden the definition of being a productive member of society.
- The public need to come to understand that poverty is a complex issue and job availability and training alone are not adequate to meet this challenge.
- It is important for officials to understand that a new approach to this issue is required. In the past society and their governments have focused on reducing the welfare roles and not on poverty reduction. It must be recognized that they are not one and the same goal. New innovative approaches like a Guaranteed Annual Income should be considered as part of a larger strategy in solving the poverty puzzle.
- Policy dealing with poverty reduction must be driven by 'social learning' (bottom up) theory not 'social reform' or 'policy analysis' (top down). While government policy is important, much of the success of poverty reduction programs will be based at the community level where trust is the highest.

Policy development with the intent of reducing or eradicating poverty in rural areas would increase the social cohesion and social functioning of rural Ontario and beyond. The rural poor are, in many ways, invisible. They don't beg for change. They don't congregate in

downtown cores. They rarely line up at homeless shelters because, with few exceptions, there are none. With few exceptions, the academic and activist communities have been preoccupied with studying and highlighting the plight of the urban poor. As well, statistics show that the gap between families in the top and bottom 20% of wealth distribution continued to widen between 1999 and 2005. It is now time for policy makers to turn serious attention to the poverty issue, and in particular, the rural policy issue.

Bioeconomy – Industrial Uses

Plant and animal products in agriculture have long been used for food and feed. The terms bioeconomy and industrial uses refer to the incorporation of renewable biomass resources — in whole or in part — into non-food and non-feed manufactured products, or energy systems. Often biomass is used to replace petrochemicals, with the benefit of making production more environmentally sustainable. This research theme focuses on three major product categories — biomaterials (e.g., textiles, carpets and panels), biochemicals (e.g., lubricants, sealants and oil) and bioenergy (e.g., ethanol, methanol and biodiesel) — all of which involve the use of agriculturally derived biomass to reduce dependency on petroleum-based materials.

Highlights from the program this year include:

- In collaboration with the Peel Material Recovery Facility, researchers from the Universities of Guelph and Waterloo have created a major type of plastic (polypropylene) from a typical Ontario municipality recycling facility and tested materials made from this mixed plastic and wheat straw fibre. The performance of these materials was very similar to those made with virgin plastic. Results suggest that such plastic has the potential for higher-end applications than anticipated. (Erickson, #026259) Read more about this research below in the Case Study.
- It appears from preliminary analysis of soy stems that cells similar to those which constitute bast fibre bundles in hemp also exist in soy, but form a thin sheath just under the outer layer of cells on the stem. Researchers believe it is possible to devise mechanical processing systems which would enable the extraction of fine fibre from soy stems comparable to that from hemp. An additional co-product, and benefit, from such a process would be the soft, core material with applications similar to those served currently by the chives from hemp. (Erickson, #026259)
- Protein extracts from natural plant sources – such as dry bean and wheat – have been found to hold significant strength and flexibility when used to create films used in food packaging, pharmaceutical capsules and bandaging materials. Preliminary findings of the study exhibit a large step forward for environmentally conscious consumers. (Pauls, #026384)
- A continuing cross-disciplinary research study is focusing on developing environmentally sustainable biocomposite products for auto-parts manufacturing. If successful, the eco-friendly products – derived from Ontario-based industrial hemp, wheat straw and soy stalk fibres – would help drive the emerging bioeconomy. (Mohanty, #026631)

Case Study

Larry Erickson, Department of Plant Agriculture

#026259: Novel Materials from Ontario Crop Plants - Linking Agriculture and Manufacturing to Create Value and Enhance Sustainability

September 1, 2005 – January 31, 2010

(up to and including 08/09)

OMAFRA / UofG Research Project Operating	\$738,000
Faculty/CARG FTE	\$196,903
Research Station Use	-
Tech/Admin Support and Indirect Costs	\$218,167
Total OMAFRA / UofG Project Value	\$1,153,070
Partner/In Kind Contributions	\$188,500
Collaborators	Nelischer, M , UofG - School of Environmental Design and Rural Development, Maine, F (CTO, PSA Composites), Sain, M (University of Toronto), Simon, L (University of Waterloo)

A new frontier in research: Integrating engineering and plant sciences to boost Ontario Agriculture and create greener industrial products

A number of University of Guelph researchers, faculty from other Ontario universities and industry stakeholders, have combined efforts to offer opportunities for Ontario agriculture and help keep Ontario clean and green. As part of the 'biocar' initiative, several different research projects are currently funded, and have been funded in the past to work toward the same goal – using Ontario crops to create industrial products traditionally created with petrochemical materials.

Bio-based industries have been widely heralded as the new engine of environmentally-sustainable economic growth. A prominent feature of such industries will be the replacement of processes and products based on non-renewable resources, such as fossil fuels and minerals, with those based on living organisms. Agriculture, as the form of human activity most engaged in managing biological systems, is strategically-positioned for a central position in this new economy. In order for this new economy to emerge, however, agriculture and manufacturing must become more closely linked.

To accomplish this, these research teams are not only made up of faculty from several universities, they are made up of faculty that don't traditionally work together – plant scientists and engineers -- engineers look to modify products with new raw materials and the plant researchers look at ways to genetically modify raw material through breeding programs so they are more amenable for various engineering applications.

One of these teams is University of Guelph Plant Agriculture Professor Larry Erickson and University of Waterloo Engineering professor Leonardo Simon. They have developed an integrated, multidisciplinary approach to research and development in economic value chains linking agriculture in Ontario to manufacturing through the use of crop-based fibres and plastics. The components of each chain consist of crop genetics, process engineering, prototype testing, and economic analysis. As well, each value chain is linked with a corporate partner positioned to assist with the testing and market analysis of new biomaterials for their industries which include: automotive, decking, siding, landscaping, furniture, films and biomedical devices.

Through a partnership with the Peel Material Recovery Facility, this team has mixed plastic with wheat straw fibre and found the performance of these materials was very similar to those made with virgin plastic. They have created the world's first production of nanofibres from wheat at a commercial scale creating biobased composites with glass-like clarity that are bendable and non-shattering. Currently they are looking at ways to devise mechanical processing systems which would enable the extraction of fine fibre from soy stems comparable to that from hemp; an additional co-product from such a process would be the soft, core material with applications similar to those served currently by hemp.

They're also contributing to an emerging new research field which has culminated in an M.Sc. thesis this past year. In June 2008, Mahsa Golbabaie defended her thesis in the Department of Plant Agriculture, University of Guelph entitled "Characterization of Ontario crop fibers for use in biocomposites (Wheat and Soybean)." Golbabaie's thesis marks the first in this department in the area of bioproducts, and further symbolizes the bridging of biology and engineering. The research was conducted at the University of Guelph and the University of Waterloo and was jointly supervised by Erickson and Simon.

The benefits of this work to Ontario agriculture accrue from the added value to components of the soybean crop such as hulls and oil and utilization of waste straw. Ontario manufacturers will benefit from a reliable, local supply of renewable feedstocks for materials which consume less energy to produce, are not petroleum-based, and are amenable to recycling. Crop-based materials have the potential to not only enhance the value of existing products, but also to give rise to entirely new products and industries – and for the bioeconomy to achieve its full impact in Ontario, integration of plant sciences and engineering is essential. The value of this to the Province lies in the creation of teams that think laterally and vertically about problems. With these collaborations significant gains in product development, new technologies and environmental sustainability are quite achievable and with that whole new manufacturing sectors will be realized.

Emergency Management

The goal of Emergency Management research under the OMAFRA/UofG Partnership is to provide a proactive, coordinated and comprehensive approach to managing agri-food emergencies in Ontario. Events such as SARS, BSE, swine and avian influenza and invasive plant pests have shown Canadians the profound impact that outbreaks can have on agriculture, the environment, human health and the economy. Emergency Management research encompasses issues related to zoonoses and public health, foreign animal disease, plant pests, and food safety. The focus is on disease agents and pests whose sudden emergence or re-emergence in Ontario requires an immediate and comprehensive response.

Highlights from the program this year include:

- An avian cell line is being developed to help in the creation of a vaccine against avian influenza, to protect the poultry industry from the devastating effects of highly pathogenic avian influenza, and could have human application as well. Currently research is being done to create this cell line from chicken livers. (Nagy, #026624)
- Coccidiosis continues to cause loss in the poultry industry and is recognized as an ongoing issue in poultry production, especially of broilers. The financial loss to local producers is primarily through anticoccidial use in feed, reduced feed efficiency and mortality. Researchers are developing a coccidian vaccine that doesn't affect bird growth, deals with parasitic resistance, and provides food free from medicinal residue. Their research has shown that the use of probiotic cultures may be the answer. (Barta, #026546)

Case Study

Supporting capacity to help with a potential pandemic – the Partnership's contribution to the H1N1 outbreak

The Partnership's support for intellectual, research and laboratory capacity has made the University of Guelph a 'go to' place when expertise and the ability to act quickly are needed in times of uncertainty or emergency. The spring 2009 outbreak of H1N1 was a shining example of this capacity being put to work, showcasing the national leadership that has been created. The Animal Health Lab (AHL) and several UofG faculty were called upon to help with information, and scientific processes during the H1N1 flu outbreak.

As a centre of expertise in animal influenza viruses, the AHL provided reference virus stocks to various government health laboratories in Canada, to help identify the virus. As well, the AHL rapidly obtained sequencing primers for differentiating the novel H1N1 virus from the endemic H1N1 virus, in the event that the new virus strain appears in Ontario swine.

The press also looked to the AHL for knowledge and information. Davor Ojkic, a scientist with the AHL, was featured in CTV news reports discussing the origins of the virus and safety issues.

UofG professors and Partnership supported researchers Profs. Cate Dewey and Ken McEwan were featured extensively in the news, commenting on the safety of eating pork and the possible economic impacts of the outbreak respectively.

Dewey was front and centre in media reports about the HINI flu virus from the initial outbreak. Chair of the Department of Population Medicine and a professor of swine health management and epidemiology, she has had many swine projects funded by the Partnership since 1996. Currently she has five active projects researching issues such as sustainable pork production and biosecurity.

Her expertise was sought to allay fears people had about consuming pork. She was featured by *CBC.ca*, the *Toronto Star*, the *Globe and Mail*, CBC TV's national evening news program *The National* and CTV's *Canada AM*. Dewey provided information about farm safety, the virus and transmission, potential sources of the outbreak and she responded to comments from the World Health Organization about pork product and workers handling pigs.

Ridgetown Campus agricultural economics professor Ken McEwan was interviewed by more than a dozen CBC radio stations across the country to discuss the possible economic impacts of the outbreak. McEwan has had many projects funded by the Agreement since 1997, and currently two active ones. His main research focus is applied economics related to farm and agribusiness management -- specialty areas include pricing, benchmarking and evaluating structural changes within the Ontario swine industry.

With the newly opened Centre for Public Health and Zoonoses, to offer even more support in terms of public health emergencies, and OMAFRA's commitment to fund research in this theme, OMAFRA and the UofG are well placed to not only be seen as national leaders in emergency management, but also greatly improve the chances for Ontarians to fare well in the case of an emergency situation.

Environmental Sustainability

OMAFRA and the University of Guelph's Environmental Sustainability research theme focuses on maintaining the ability of natural resources — soil, air, water and biodiversity — to support and strengthen the agriculture, food and bioproduct sectors, and rural communities. To protect Ontario's diverse environment, researchers provide science-based direction for government policies and legislation. Population growth presents opportunities for new markets and challenges for agriculture and the environment.

The OMAFRA/UofG Partnership aims to balance the needs of people and the agri-food industry with environmental priorities in order to achieve sustainable agriculture and food production.

Highlights from the program this year include:

- Researchers in the School of Engineering are investigating how intensive animal housing is contributing toward common pollutants such as ammonia and particulate matter in the environment. If successful, the research could extend into other sectors, assisting multiple livestock industries in reducing their environmental footprint and improving air quality. (Van Heyst, #026597)
- The most comprehensive benchmarking initiative undertaken in agriculture to date is being performed by researchers in the Food, Agriculture and Resource Economics Department. The study is looking to further expand on key performance indicators to develop environmental, production and marketing best management practices, which can provide important insight into policy formulation and evaluation. (Bredhal, #026592)
- Livestock producers are interested in processes that break down manure in the absence of oxygen. A three-year research study, assessing land application practices of digested manure, aims to develop system models which demonstrate reductions of greenhouse gas emissions, odours and the risk of pathogens and nutrients migrating to ground and surface waters. (Crolla, #026577)
- Bioenergy systems based on perennial crops such as miscanthus are more sustainable and once established, can persist for 20 years. Miscanthus across varied soil types and management systems is being researched to determine suitability for biomass production and combustion as well as validate environmental impact. (Deen, #026598)

- Researchers in Geography are updating watershed models. Current models are based on American data, but an update to include Ontario-specific conditions such as spring melting and the purifying effects of wetlands could significantly enhance the safety and cleanliness of sources. (Yang, #026545)
- Currently there is interest in using plant biomass such as crop residues for the production of cellulosic ethanol. Researchers are evaluating the environmental sustainability of novel bioenergy production systems. A major issue associated with use of crop residues for cellulosic ethanol is long-term soil health. Negative impacts may be minimized through Best Management Practices (BMPs) such as crop rotations and minimum tillage. These BMPs are known to affect the field-scale water budget and greenhouse gas emissions (GHG) through complex interactions of factors. This team is also developing algorithms to use data from the recently launched RADARSAT2, which will provide high-resolution active microwave imagery, to discern tillage practices which will provide the needed information for future scaling up of field results to the province. (Warland, #026579)
- Hydrology (or soil water budget) is the driver of productivity and pathway/fate of potential contaminants on the farm. Potential contaminants include nutrients such as nitrogen and phosphorus, soil particles, pathogens and other chemicals such as pesticides and pharmaceuticals. Researchers are using modeling as a useful and cost-effective tool for assessing regional variability in soil water budgets, impacts of climate change on groundwater recharge (when water from rain and snow melt reaches the water table) and surface runoff and plant available water. This work will be greatly beneficial for producers (in guiding timing of manure spreading, crop planting and harvest, irrigation management and hybrid selection), government personnel (as input into source water protection strategies, identifying areas prone to runoff and drainage losses of nutrients and other contaminants), and conservation authorities for flood forecasting. (Parkin, #026589)

Case Study

Ron Fleming, Ridgetown Campus

#026533: *Manure and Organic Waste Treatment Technologies*

April 1, 2007 – March 21, 1011

(up to and including 08/09)

OMAFRA / UofG Research Project Operating	\$155,000
Faculty/CARG FTE	\$331,927
Research Station Use	-
Tech/Admin Support and Indirect Costs	-

Total OMAFRA / UofG Project Value	\$ 482,325
Partner/In Kind Contributions	\$858,668
Collaborators	McEwan, K. , UofG Ridgetown, Kinsley, C. , UofG Alfred, Crolla, A. , UofG Alfred, Pattey, E. , AAFC, Ottawa, Desjardins, R. , AAFC, Ottawa, Ball-Coelho, B. , AAFC, London/Delhi, Kennedy, K. University of Ottawa - Dept. of Civil Eng

In the coming years, traditional manure management techniques used over the past forty years will not be sustainable either environmentally or economically for many livestock producers. By measuring new technologies for their environmental and economic impacts, researchers are looking at ways to create sustainable systems, opportunities for revenues through energy production and vibrant rural communities.

This research study involves the development and uptake of treatment technologies at the farm/operational scale. A number of technologies are available to livestock producers, even though most of the recent interest among producers has been in two main areas: composting and anaerobic digestion. The technologies being studied so far are anaerobic digestion (livestock manure and other organic inputs, sourced both on-farm and off-farm), constructed wetlands and reed bed filters (manure runoff and septage), membrane filtration (manure), composting (manure and organic wastes) and solid/liquid separation by coagulation (manure and wastewater).

Specific challenges faced by the agricultural/rural communities are being addressed. These include such important areas as nutrient availability for growing crops, potential for odour release, economic feasibility and greenhouse gas emissions. In addition, arising opportunities for energy production are being considered, mainly the production of electricity and heat using biogas produced in anaerobic digestion. Through a series of lab to farm scale studies, the economic and environmental impacts of each technology are being compared with a baseline, or traditional case of storage and land application. This data will be used to validate existing assessment models and tools developed by others. The most appropriate assessment tool will be modified and used to compare and clearly present the advantages and disadvantages of each technology.

The data gathered will be used to develop system models, design recommendations, detailed case studies and to provide data to OMAFRA for the development or refinement of technology Fact Sheets.

Livestock producers will benefit significantly by receiving comparative information on manure treatment options as well as on opportunities to increase farm revenues through energy production. There is also the potential for other beneficiaries – rural municipalities and septage haulers who will benefit from cost effective technologies to treat septage. As well, advantages to rural residents include reduced odours, reduced risk of pathogen migration to waters and a more vibrant rural economy.

Food for Health

Today's consumers are more interested in food and nutrition than ever before. OMAFRA and the University of Guelph's research into consumer trends, and food production and formulation has the potential to improve the health of Ontarians and provide competitive opportunities for producers and agri-food companies. The Partnership is also committed to supporting research to provide consumers with functional foods — foods that have been shown to have health benefits, such as reducing heart disease, the incidence of diabetes and prevention of other chronic degenerative diseases such as cancer and Alzheimer's disease. The scope of this research theme is large and complex, but the social and economic benefits can be enormous. Consumers' purchasing decisions, dietary patterns and increased knowledge about the relationship between food and health will drive this research theme forward.

Highlights from the program this year include:

- Researchers are examining fibre fortification of dairy products such as milkshakes, puddings and frozen desserts, in response to the lack of soluble fibre in the average Canadian's diet. When fermented by a culture of bacteria in the body, the fibre can produce volatile fatty acids, leading to numerous health benefits. (Goff, #026573)
- As a result of low soybean isoflavone intake in the general diet, researchers are exploring means of enhancing dietary intake through fortified foods such as soy isoflavone-enriched bread with improved sensory attributes for preventing cardiovascular diseases. As the isoflavone content can remain viable from soybean through to souyberea, the study's results will create a value transition from the field to the fork. (Duncan, #026575) Read more about this research below in the Case Study.
- The dark brown colouration in French fries and potato chips can be associated with the risk of developing many types of cancers. The brown colouration results from chemical reactions that occur during frying, involving reducing sugars that accumulate in high levels as a result of low temperature potato storage. In an effort to face up to this major potato industry challenge, researchers are attempting to develop new potato varieties resistant to this condition. (Yada, #026578)
- Researchers have discovered that eating the right kind of bread can help regulate blood sugar levels, and potentially help with type 2 diabetes. During a study on adults who have the disease, it was found that eating sourdough bread can help control blood sugar levels, for hours at a time. This research has resulted in the writing of an introduction to a cook book published by the Oats and Barely Council of Ontario and it was presented to the council and at the Agri-Food Innovation Forum meeting in February of 2009. As well, it has led to a proposal for a long-term association with Maple Leaf Foods. (Graham, #026581)

Case Study

Alison Duncan, Human Health and Nutritional Sciences

#026575: Exploration of Soy Isoflavone-Enriched Bread in Relation to Improved Formulation and Sensory Attributes, Cardiovascular Disease Risk and Economic Market Feasibility

May 1, 2008 – April 30, 2009

(up to and including 08/09)

OMAFRA / UofG Research Project Operating	\$50,000
Faculty/CARG FTE	\$63,765
Research Station Use	-
Tech/Admin Support and Indirect Costs	\$13,680
Total OMAFRA / UofG Project Value	\$ 127,445
Partner/In Kind Contributions	\$72,000
Collaborators	Marcone, M , UofG - Department of Food Science, Duizer, L , UofG - Department of Food Science, Seetharaman, K , UofG - Department of Food Science

This study was a follow-up on a previously funded 4-year project (#026211-Bioavailability and Economic Benefits of Value-Added Isoflavone-Rich Soybeans Incorporated into a Functional Food) that used an inter-disciplinary team to breed soybeans with varying isoflavone content; developed a functional food (bread) from these soybeans; confirmed bioavailability of the isoflavones in human clinical studies and conducted economic consumer experiments to explore the feasibility of introducing the bread into the marketplace. Although the soy isoflavone breads were generally accepted and liked, there were sensory challenges specific to the high-isoflavone soy bread. Therefore, this 1-year project was an opportunity for the team to work on reformulating the high-isoflavone soy bread while continuing to explore its marketplace feasibility by testing its production on an industrial scale.

The sensory challenges identified in the 4-year project were used to develop an improved and more consumer-acceptable soy bread. Experiments that tested the interactions between soy flour, soy protein isolate, starch, gluten and wheat flour created a final formulation to satisfy several Health Canada approved nutrient content claims. The newly formulated soy bread also underwent sensory testing that established its liking and improvement. The soy bread was also examined for its commercial viability through interaction with industrial partner Canada Bread (Maple Leaf Foods). Test bakes of the bread were completed at Canada Bread to confirm that the product would be feasible for industrial production. Overall, the combination of improved formulation, consumer acceptability, satisfaction of health claims and feasibility of production on an industrial scale, positions this unique Ontario-created soybean-based bread extremely well for success in a health-conscious society.

This research extends benefits to numerous stakeholders within the Ontario agri-food sector. Ontario can gain a competitive advantage in the sale of isoflavone-manipulated soybeans for incorporation into functional foods. Consumers can benefit through increased choice of foods targeted to improve health. Government can benefit through reduced health care costs and there is potential for health claims for foods containing these soybean varieties, which will showcase Ontario soybeans. Overall, this research can create a transition of value from the field to the fork resulting in benefits for the Ontario agri-food sector, consumers and government.

Product Development and Enhancement through the Value Chains

This research theme focuses on strengthening agri-food value chains in Ontario, through research to provide innovation in product development and enhancement. Businesses operating along a value chain can combine their resources and capabilities to achieve commercial success that might not otherwise have been possible if they acted in isolation. Agri-food value chains are not limited to primary production and processing. The OMAFRA/UofG Partnership supports research into other important components including market analysis, consumer behaviour, commercialization and quality assurance. By improving any or all aspects of product development, overall productivity, profitability and sustainability can be improved.

Highlights from the program this year include:

- The ability to supply less expensive antibody therapeutics for the people of Ontario will save lives, improve quality of life and will reduce the financial burden to Ontario's health care system. Researchers are developing less expensive antibody production and purification platforms by using genetically-modified plants as bioreactors for the multi-billion dollar recombinant protein markets, in conjunction with the CBD- and membrane chromatographic purification technologies. This research will also allow Ontario's agriculture sector to capture new high value uses for their crops, ensuring Ontario's strong agricultural-based economy for decades to come. (Hall, #026257)
- Detecting plant pathogens early is essential to avoid disease outbreaks in greenhouse crops grown using nutrient mineral solutions instead of soil. Researchers are working to develop paper filters to capture pathogens at low concentrations, combating damage and economic losses to Ontario and Canadian greenhouse growers. (Hall, #026257)
- Starch is not only a cheap, natural and renewable commodity, but its structure and breakdown capability allow for the production of yields suitable for various end uses. Biologists are addressing the limitations of starch varieties and desired products available on the Ontario market, through the use of waxy-based cereal crops. (Emes/Tetlow, #026262) Read more about this research below in the Case Study.
- Food Science researchers are working on a major advance in non-thermal technologies for pasteurizing milk and other opaque fluids. Their alternative uses an ultraviolet reactor, which enables pathogen destruction, without changing the milk's raw attributes. (Warriner, #026606)

Case Study

Michael Emes, UofG - Biomedical Science
Ian Tetlow, UofG - Molecular and Cellular Biology

#026262: Production of novel industrial starches using Waxy-based cereal crops

October 1, 2005 – October 1, 2009

(up to and including 08/09)

OMAFRA / UofG Research Project Operating	\$490,000
Faculty/CARG FTE	\$456,968
Research Station Use	
Tech/Admin Support and Indirect Costs	\$326,811
Total OMAFRA / UofG Project Value	\$1,273,779
Partner/In Kind Contributions	\$472,655
Collaborators	Lee, L. , UofG – Department of Plant Agriculture, Myers, A. , Iowa State University, James, M. , Iowa State University, Morell, M. , CSIRO, Canberra, Australia, Wait, R. , Imperial College, London UK, Lenz, R. , Lorama Chemicals Inc., ON, Baute, D. , Maizex Seeds Inc. ON

Starch is not only a cheap, natural and renewable commodity, but its structure and breakdown capability allow for the production of yields suitable for various novel end uses. This research project addressed the limitations of starch varieties and desired products available on the Ontario market, through the use of waxy-based cereal crops. To do so, it has built on, and significantly extended fundamental research knowledge on important aspects of the regulation of cereal starch metabolism, facilitating the development and delivery of novel starches which are not currently commercially available to industrial end-users in Ontario. Integral to the systems which are now in place is a team capable of driving this research knowledge into the creation of useful, improved, economically and environmentally favorable industrial end-products, thereby forming an integrated value-chain.

The program generated, and will continue to generate, a number of combined benefits, which will be realized over a varied timescale, and whose combined efforts serve the needs of Ontario-based industries, and in addition, contribute to fundamental scientific knowledge in an area of critical importance to both the food and non-food sectors. Specifically, and in the short-term, Waxy-based (amylose-free) maize hybrids have now been produced, and their starches are being evaluated by industrial end-users (e.g. Lorama Chemicals Inc.) as potentially improved sources of Waxy starch, not currently available to the paints/coatings and paper and board industries. This novel germplasm now forms the platform for future studies and analyses.

Further, the novel starches continue to be analyzed by researchers at the UofG and at the Division of Plant Industry, CSIRO (Australia) in order to better understand the process of protein-complex formation and its impact on starch structure and architecture. The latter studies

at Guelph and CSIRO are seen as on-going, long-term research which will enhance understanding of the regulatory processes controlling polymer synthesis, and which should allow a more targeted approach to future crop improvements.

This research program has been instrumental in leveraging additional research funding (totaling \$1,110 K) which has allowed this team to develop new and related lines of enquiry --- for example an NSERC Strategic Grant (2006), Ontario BioCar Project (2006), two NSERC Discovery Grants (2007 and 2008) and the Biopotato ABIP project (2008). The program has established a physical and intellectual infrastructure which will facilitate the production of new crop varieties for specific end-uses.

The success of this program will produce a number of important benefits throughout the value-chain; 1) new high-value corn varieties will be available to Ontario growers (Maizex Seeds Inc.) and millers, supplying an Ontario-based market, thus improving competitiveness throughout the value-chain from grower to end-user by reducing transport costs, 2) new starches reduce costly (and sometimes unpredictable) chemical modifications by the industrial end-user, resulting in improved competitiveness for the end-user , 3) operating plants will therefore be able to reduce (or eliminate) environmentally hazardous waste materials derived from the chemical pre-treatment of starches which currently occurs.

The discovery of this science will help Ontarians deliver novel starches which are not currently commercially available to industrial end-users in Ontario, and in addition, will contribute to fundamental scientific knowledge in an area of critical importance to both the food and non-food sectors.

Production Systems

This research theme seeks to enhance the profitability of agricultural production. It encompasses other areas of the OMAFRA/UofG Partnership research program that may play a significant role in productivity or profitability, including environmental sustainability, consumer demand, bioproduct opportunities, and agricultural and rural policy. Government support of Production Systems research is critical for a number of reasons. Animal and plant health and the impact of agriculture on the environment are closely tied to important priorities like safe food and clean water. Legislative requirements, minimal private sector research, and the enormous significance of agricultural production to the Ontario economy all point to the importance of this research theme.

Highlights from the program this year include:

Livestock:

- Colostrum management is instrumental in ensuring a calf's future health status, and a large portion of calves do not meet the standard cut-off for protein antibody concentrations. Researchers are evaluating health parameters – such as growth performance and disease occurrence – of calves receiving immunoglobulin supplementation to determine whether such a method proves effective. (Leslie, #026620)
- Poultry health and welfare is being studied, with the goal of maintaining the superior health status of chickens and in turn increasing production efficiency and providing a safer food source for human consumption, among others. (Nagy, #026371)

- A unit is now in place at the Arkell poultry research station to monitor ammonia emission into the atmosphere. This will allow for more accurate assessment of management strategies aimed at improving in-barn air quality and environmental impact of poultry production. (Leeson, #026548)
- Cows with high, low or average immune responses can be identified using a standardized patented method developed at the University of Guelph. Immune responsiveness is heritable and associated with various health and performance traits. Different expression of certain immune response genes is also associated with these three diverse phenotypes. (Mallard, #026626)
- Genetic markers for substandard pork meat quality have been identified. This will allow for effective selection of animals for improved pork meat quality and further improve consistency of pork meat products (highlighted in Globe and Mail July 2009). (Squires, #026398)
- Equine stem cells isolated from adult bone marrow can be used to grow cartilage in the laboratory. Current studies show that these cells can be induced to form cartilage in the laboratory and can be transplanted successfully in small (6.5 mm diameter) grafts. The ongoing work attempts to produce massive grafts composed of calcium polyphosphate bone substitute with engineered cartilage on the surface. (Hurtig, #026636)
- It has been demonstrated that oral administration of *Lactococcus lactis* expressing porcine epidermal growth factor provided beneficial effects to intestinal growth of newly-weaned mice and pigs. This finding lays the foundation for developing a strategy to circumvent the problem of digestive dysfunction and the associated reductions in growth gain in the early-weaned piglets. (Li and Friendship, #026361)

Case Study

Stephen Miller, Animal and Poultry Science

#026360: Genomic profiling for beef quality, efficiency and value.

May 1, 2006 – April 30, 2010

(up to and including 08/09)

OMAFRA / UofG Research Project Operating	\$405,000
Faculty/CARG FTE	\$793,987
Research Station Use	Arkell Beef, Ponsonby General Animal Facility - \$3,536,836
Tech/Admin Support and Indirect Costs	\$958,597
Total OMAFRA / UofG Project Value	\$5,694,420

Partner/In Kind Contributions	\$2,455,900
Collaborators	Mandell, I. , UofG – Department of Animal and Poultry Science, Swanson, K. , UofG – Department of Animal and Poultry Science, Purslow, P. , UofG – Department of Food Science, Cranfield, J. , UofG – FARE, Dony, R. , UofG – School of Engineering, Johnson, W. , UofG – Department of Population Medicine, McEwen, P. , UofG – Ridgetown Campus, Berthiaume, R. , AAFC, Wilton, J. , UofG – Department of Animal and Poultry Science, Estrada, A. , UofG – Population Medicine, Norkooli, R. , OMAFRA.

To ensure short term viability and long term prosperity, Ontario's beef industry must secure an appropriate share of the domestic market and premium export markets. To secure these markets the beef industry requires research support via new technologies for improved production efficiency and in the critical area of improved value added products. This research is developing beef products with specific quality and functional food attributes appealing to consumers. Building on the recent sequencing of the beef cattle genome, this research is developing new tools to select beef cattle in order to improve product quality and value traits which were previously not practical. Beef tenderness, the primary consumer quality concern, will be dramatically improved. Healthier beef will be produced by improving the level of beneficial fatty acids. Value chain systems will encompass improvements from reproduction through feedlot feed utilization based on their contributions to economic viability. This value chain research team reflects expertise in Genetics, Food Science, Economics, Nutrition, Physiology, and Engineering is exploring frontiers which will contribute to a more competitive beef industry in Ontario.

Findings have shown:

- Finishing cattle on alfalfa pasture resulted in superior gains, carcass traits, and tenderness versus use of grass pasture. Tenderness scores for beef from alfalfa pastured cattle were superior to beef from drylot-finished cattle fed an 85% concentrate ration. Pasture finished beef can deliver superior eating quality to consumers in regards to tenderness.
- The quality of cull cow beef can be enhanced during post-harvest handling, to deliver a similar eating quality experience as Canada's top grades of beef.
- Wheat straw can be incorporated at 40% inclusion level into a haylage-based winter ration as indicated by adequate performance of the cow pre-partum and the superior performance of the calf at weaning. However, diets containing 40% corn staklage are not recommended due to decreased performance.
- The underlying physiological factors related to feed efficiency and the mechanisms related to beef tenderness have been further elucidated and provide strategies for determining the most informative genes and the Single Nucleotide Polymorphisms (SNPs) within these genes and pathways to target for selection purposes.
- Genetic markers (2 SNP) were found to be significantly associated with feed efficiency and independent validation will determine their usefulness for genetic selection.
- A whole genome scan including 35,086 SNP has resulted in a large number of significant SNP for all of the efficiency, meat quality and carcass traits analyzed. An international agreement including the University of Guelph, University of Alberta, the United States Department of Agriculture and the Cooperative Research Centre for Beef

Genetic Technologies in Australia has been established to determine the most useful subset of SNP for selection purposes.

A vibrant rural Ontario requires equitable production and economic activities, and agriculture remains one of the primary pillars in this regard. Ontario's Beef Industry represents one of the major sources of farm cash receipts. This research will ensure the short term viability and long term prosperity of Ontario's beef industry by securing an appropriate share of the domestic market and premium export markets. The primary beneficiaries will be beef industry stakeholders such as producers and processors. However, all Ontarians will benefit from a stronger rural Ontario and through access to locally produced, desirable products that represent good value.

Crops:

- Researchers have examined soybeans, canola and dry beans as an opportunity for Ontario growers and the agricultural sector to provide new and healthier food forms to various markets. Their development of novel compounds in the seeds has led to various supported bean registrations and releases to the Ontario seed industry. (Rajcan, #026363)
- Vegetables are an essential component of healthy diets and consumption is known to prevent numerous diseases. With the main goal of increasing consumption, Plant Agriculturalists are examining a wide range of vegetable crops and production practices to enhance visual and nutritional quality, increase yield and minimize environmental impacts. (McDonald, #026484)
- Capturing potential profits presented by the bioeconomy requires the soybean sector to maintain a competitive edge through highly differentiated bioproducts, say researchers. Their recent study aimed at increasing demand for Ontario-produced commodities suggests that an IP system in Ontario could serve as the main channel to supply high quality soybeans tailored to end-user needs. (Rajcan, #026363)
- Researchers are finding ways to create a local hazelnut supply for companies like Ferrero. A test plot has been expanded at the Simcoe Research Station to grow trees less likely to fall victim to eastern filbert blight, and fast-track growth so there are ten ten-acre plots in Simcoe and Niagara by 2012. (Dale, #026645)

Case Study

K.H. Fisher, Plant Agriculture – Vineland

#026480: *The pursuit of excellence – quality enhancement from vineyard to vintage – the new integrated grape and wine research programme for Ontario's future*
May 1, 2007 – April 30, 2011

(up to and including 08/09)

OMAFRA / UofG Research Project Operating	\$358,000
Faculty/CARG FTE	\$369,540

Research Station Use	Vineland, Cedar Springs - \$115,826
Tech/Admin Support and Indirect Costs	\$160,252
Total OMAFRA / UofG Project Value	\$ 1,003,618
Partner/In Kind Contributions	\$2,084,042
Collaborators	Nassuth, A. , UofG – Department of Molecular and Cellular Biology, Strommer, J. , UofG – Adjunct Faculty Brown, R. , UofG – School of Engineering, Gillespie, T. UofG – Land Resource Science, Meng, B. , UofG – Molecular and Cellular Biology Paliyath, G. , UofG – Department of Food Science, Rinker, D. , UofG – Department of Plant Agriculture, Shelp, B. , UofG – Department of Plant Agriculture Swanton, C. , UofG – Department of Plant Agriculture Vandermerwe, G. , UofG – Department of Molecular and Cellular Biology, Voroney, P. , UofG – Department of Land Resource Science, Zandstra, J. , UofG – Ridgetown Campus

The Ontario grape business, a specialized cool climate industry, with a farmgate value of over \$70M, represents the livelihood of about 500 growers who work approximately 7,000 ha of land in Southern Ontario. In spite of increasing provincial wine sales, the Ontario market share has not followed suit but has stabilized at approximately forty percent for the past seven years. The immense challenge for the Ontario grape and wine industry is to develop strategies for stable, commercially viable production of high quality fruit. These field strategies, combined with improved vinification methods, will foster the production of superior Ontario wines capable of capturing new markets locally and internationally, despite a difficult climatic environment and huge competition from abroad.

This project involves a consortium of several researchers, who are working on eight subprojects to develop optimal precision vineyard management strategies to identify variability, optimize germplasm resources for Ontario to minimize stress sensitivity and maximize versatility, optimize consumer interest and market development of wines from quality vineyards and new lines and to optimize communication among researchers, government, grape growers, and wineries.

Work is being done using aerial remote sensing for delineation of vineyard zones worthy of separation for quality vintages could be an extremely useful tool for maximizing the value of fruit from vineyards where variability is not temporal but spatially stable. Identification and interpretation of these zones would give growers and wineries tools to expand their markets and use all possible land to its maximum potential, a critical issue here in the Greenbelt where land use is restricted. In 2008 the team worked closely with five grower-winemaker groups, providing digital images and prints of their vineyards on four dates and discussing interpretation of the information provided. An introductory workshop was held in March with subsequent individual meetings through the growing season. Work has begun with a local consulting engineering firm to develop and implement a web-based GIS system for distribution of the imagery and associated vineyard maps to participating growers. One of the wineries now uses zone segregation at harvest to produce a series of ultra-premium “small lot” wines. The Wine Council of Ontario expressed interest in acquiring imagery for all wine producing areas of Ontario, and a proposal has been submitted to that organization.

Genetic investigations have identified chromosomes that contain genes which are important for freezing tolerance. These molecular markers will be used to screen populations of potentially cold tolerant grape vines. In addition, novel genes associated with stress tolerance have been characterized in lab strains of yeast. These could be potentially useful in icewine production if introduced into commercial yeast strains.

A class of compounds found in grapes called polyphenols have been shown not only to be strong antioxidants, but also to affect gene expression after being consumed. These polyphenols repress gene expression that is normally associated with cancer tumor development. The importance of fruit consumption in disease prevention is highlighted in these studies.

Grape production in Ontario is inseparable from the wine industry. Efficient improvements at each link in the grape/wine value chain require expertise that is presently distributed across several institutions. This research represents a true value chain, focused on viticulture, but linked with agricultural policy, downstream processing, health considerations and marketing and will help the Ontario wine industry improve and flourish.

Grape production in Ontario is inseparable from the wine industry. Efficient improvements at each link in the grape/wine value chain require expertise that is presently distributed across several institutions. This research represents a true value chain, focused on viticulture, but linked with agricultural policy, downstream processing, health considerations and marketing and will help the Ontario wine industry improve and flourish.

Business Development Office

The 2008/09 year saw several major changes that bring new challenges and new opportunities to the Business Development Office (BDO). The highlights are listed and briefly discussed below:

- A new collective agreement was negotiated with the University of Guelph Faculty Association (UGFA) enabling the option of inventor owned Intellectual Property (IP). Concurrently, the IP policy was changed to an inventor owned policy with some key exceptions. With respect to the OMAFRA/UofG Agreement, IP ownership remains vested with the University, and the terms of Schedule N of the Agreement prevail. This agreement allows inventors to choose between working with the BDO or to independently pursue commercialization of their intellectual property. It will force the BDO to be more proactive in its outreach to UofG inventors and showcasing its ability to effectively enable commercialization of UofG technologies.
- The BDO has been searching for a new Director since December 2008 and expects to complete the search early this fall. Sue Bennett assumed the role of interim Director and while under her leadership has been involved in the implementation of several of the changes listed below.
- The C4 consortium lost its source of funding which would have seen the disintegration of this collaborative network of Technology Transfer offices in Southern Ontario but for the successful lobbying of the Directors and VPs of the Universities affected by this decision. Funding has been reinstated for 2010. While the BDO will continue its membership with the C4, we will participate with collaborative projects as required by dedicating the most

appropriate Technology Transfer Manager (TTM) to a given task rather than having only one TTM designated as the 'C4 representative'.

- In recognition of the importance of the commercial opportunities arising from the OMAFRA/UofG Partnership, the BDO has a dedicated TTM to deal specifically with any OMAFRA funded research. Tyler Whale has been appointed to this position (which is partially funded through the KTT program) and will participate with OMAFRA's KTT program team.
- The BDO is taking measures to increase its outreach to researchers and industry, to educate on the value of protecting IP, to assist with the IP/commercialization portions of grant preparation, to initiate greater contacts with industry, to streamline its processes to improve efficiency and effectiveness.
- Dr. Kevin Hall is the new VPR who has indicated an increased focus on commercialization efforts and focus on partnering with industry in applied research and collaborative R&D agreements. The BDO meets regularly with the VPR and AVPR to discuss goals, progress, strategy and direction.
- Significant effort has been put in to developing a relationship with investors and government officials from China in preparation for opportunities to license technologies to the Chinese and to initiate collaborative research programs with this major player as well.
- The BDO sent representatives to several conferences and networking sessions this past year, including BIO Atlanta where we participated for the first time in the pre-scheduled partnering sessions. This proved to be an excellent format for making important connections. BDO was also invited to present the Enviropig™ technology at the World's Best Technology (WBT) conference in Texas.
- There has been a significant number of new staff additions to the BDO as follows:
 - a. Dr. David Hobson PEng (mechanical), DVM, DVSc (lab animal science)– TTM – began March 2008. David will be working primarily with OVC technologies as well as those relating to animals and vaccines.
 - b. Dr. Tyler Whale PhD (Microbiology/Immunology), MBA – TTM – began October 2008. Tyler is the lead for the OMAFRA/UofG partnership technologies, though other managers will also work with OMAFRA technologies depending on the best suited expertise required.
 - c. Catherine Geci MSc (Neuroscience), LLB (civil law) – TTM – began July 2009. Catherine's portfolio will consist primarily of life science related technologies.
 - d. Colleen McCaffery – Technology Transfer and Contracts Assistant – began June 2009
 - e. New Director TBD this fall

This turnover highlights a burden on the BDO in that there is a continuous need to train new team members, however, the team is a very competent group of people and there is an opportunity to continue to improve the contributions the BDO makes to the University and to OMAFRA.

Case Study #1: Enviropig

Technology: Forsberg 19990526

Title: *Transgenic animals expressing salivary phytase*

Disclosure Date: May 26, 1999

OMAFRA split: 13.86%

Themes: Environment; Production Agriculture

Technology Summary: The Enviropig is a transgenic pig created over the past 15 years. This extraordinary animal biotechnology significantly reduces environmental non-point source pollution by reducing the phosphorus content in its manure by 30% to 60%. The Enviropig is leaner, reaches market weight sooner and is slightly cheaper to feed than comparable commercial pigs. It is patented in China, USA and Canada with 11 years of protection remaining. An estimated \$5 M has been invested in research to develop the Enviropig. Regulatory applications for human consumption are being reviewed by both Canadian and USA agencies; however no regulatory efforts have been initiated in China. The BDO has not secured any industry partners to date and it appears industry is waiting for guidance on the probability of regulatory approval before investing. This Enviropig is managed by the BDO and further supported by the OMAFRA/ UofG research Agreement to enable commercialization.

Research Partner: Ontario Pork (OP) has invested ~ \$1.3 M in direct research and development by providing grants to Cecil Forsberg under a long term research collaboration agreement. The BDO has been negotiating a new revenue sharing agreement with OP to replace the previous research collaboration agreement.

Intellectual Property: Issued patents in USA and China have been maintained and office actions for the Canada patent application (pending) were addressed. The trademark “Enviropig” has been applied for in China and North America. The BDO has also secured web domains Enviropig.ca, Enviropig.com, Enviropig.org, and Enviropig.us. Under the direction of Cecil Forsberg, the BDO has maintained a website and a Wikipedia article detailing the safety, science and commercial potential of the Enviropig.

Regulatory Approval: Regulatory submissions have been made to both the US-FDA and Health Canada. The US review process is approximately half completed; however it has been stalled by FDA for the past year due to unrelated factors. A Canadian regulatory submission has started and is predicted to take 2 years. Cecil Forsberg prepared, managed and procured these submissions over the past year. The BDO has not initiated any Chinese regulatory submission due lack of a partner to date. Additional research using proteomic methods was conducted to compare the protein expression of tissues from the Enviropig to normal control pigs. This will be included in the regulatory applications as an addendum.

Markets: China is the main target market with more pork consumption (700M hogs/yr) than the rest of the world combined, and the Chinese government is our preferred licensee target. The BDO (David Hobson) travelled to Beijing and Wuhan in China with the Canadian Swine Export Association, to solicit interest and meet with P.R.C. government officials and state owned company representatives, and leading academic researchers at the Chinese Academy of Agricultural Sciences. Interest was modest and no Chinese partners have been secured. Some

marketing materials have been prepared in Chinese and several meetings attended in Canada with representatives from several Chinese Universities. The BDO has also attended meetings held by the Trade Commissioners for China and the International Science and Technology Partnerships which aims to assist Canadians with research and commercialization in China. Several other vital contacts have been solicited to seek out interested parties in China and the BDO is currently in the process of hiring agents; on commission, to find Chinese partners.

The North American market (~130 M hogs/yr) although much easier to access, is struggling to remain economically viable. North American companies are at best mildly supportive of the Enviropig and at worst markedly afraid of launching the technology due public resistance to accept the technology and the potential for damage to the pork industry's image as a whole. Many North American companies have been contacted and none have shown interest in the Enviropig until markets improve or regulatory approval is imminent. Viagen, a USA animal cloning company, has expressed interest pending regulatory approval. The BDO (DH) and inventor Cecil Forsberg presented the Enviropig technology at the World's Best Technology Showcase in Arlington TX in March 2009, but no industry receptors were secured. The BDO (DH) is an active member of the Biotechnology Industry Organization – Agricultural Biotechnology Policy Committee and has contributed to industry guidance to the US – FDA concerning commercialization of transgenic animals for agriculture. Both Cecil Forsberg and John Philips (inventors) have made several public presentations and conducted many newspaper and magazine interviews discussing the science and commercial potential.

Important unprotected markets include Brazil, Argentina, Mexico, South East Asia, and the Philippines however these will not be targeted until after the Enviropig is launched in protected markets. Asiago, a Canadian pork consulting company has shown interest in delivering the Enviropig to unprotected markets.

Case Study #2: Plantform Corporation

Technology: Hall 20090311-2

Title: *Materials for the production and purification of plant-produced Trastuzumab*

Disclosure Date: March 11, 2009

OMAFRA split: 35.0%

Themes: Product Development; Bioeconomy

Technology Summary: The laboratory of J. Christopher Hall has long been interested in the production of proteins, including antibodies, in plants. Of particular interest has been the production of trastuzumab, which is also known as Herceptin. This antibody is one of the most successful biotechnology-based drugs, and has profoundly positive effects for many breast cancer patients. By developing an easy method to produce trastuzumab in tobacco plants, it creates the potential to both enter a very large market while decreasing costs for cancer patients all over the world.

The Hall lab has developed the materials to facilitate the production of trastuzumab in tobacco plants. These materials have not been patented, but have been licensed to Plantform Corporation, creating a means to develop the technology further.

Plantform Corporation was founded by Chris Hall, Don Stewart and Mark Goldberg as a vehicle for attracting investment and developing this technology further. The company was awarded the honour of being recognized as one of “Canada’s Top 10” investment opportunities in the LifeSciences category in September 2008. The UofG completed its license agreement with Plantform in December 2008. This license agreement included a small upfront payment in recognition of the cash difficulties faced by emerging companies. By agreeing to a low upfront payment, the University is supporting an Ontario start-up that has the potential to one day produce a success story for local jobs and investment.

Plantform issued a press release on January 29, 2009 describing the license, including a quote from Dr. Kevin Hall describing the importance of the OMAFRA Partnership. The license was also highlighted in the February 25th edition of The Buzz newsletter.

Since the signing of the license agreement, Plantform has earned support from the Ontario Centres of Excellence, and are working hard to recruit venture capital investment.

Case Study #3: Healthy Mint

Technology: Kott 20060221

Title: *Mentha spicata (spearmint) clones with ultra high levels of rosmarinic acid (a powerful plant antioxidant) useful for reducing effects of various human inflammatory ailments including asthma*

Disclosure Date: February 21, 2006

OMAFRA split: 25.43%

Theme: Food for Health

Technology Summary: Dr. Laima Kott has developed a variety of mint that contains high levels of rosmarinic acid, and compound that is described in the literature has having strong anti-oxidant and anti-inflammatory properties.

Patent Application: While the University has filed a patent application, it has low value without the mint itself, and the mint itself requires strong evidence of efficacy in order to be successful.

Strategy: Since rosmarinic acid is valuable as a compound, and since mint is a food as well, the University has split the fields of use in hopes of finding multiple exclusive licensees. The University has had some success here, finding a licensee in Alberta to grow the mint and extract rosmarinic acid, and a licensee in the United States who wishes to enter the mint into field trials beside several of its own varieties. The University hopes also to find licensees in the functional food and human health areas as well, and has taken steps in that direction.

Asthma: As part of a strategy to establish human health aspects of the mint, a study was undertaken at McMaster University for patients with nasal polyp symptoms, using funding from LAIF. Unfortunately, the study was unsuccessful in part due to the method used to measure response, and it part due to our choice of symptoms. We went back to the literature, discussed it with partners, and decided to pursue inflammation instead.

Inflammation: Through funding from the OMAFRA and C4 POP funds, a study has been undertaken to measure both in vitro and in vivo effects of the mint on inflammation. The in vitro

results showed some success, and so the study is being followed up in horses. This study is expected to be completed in fall 2009. Ontario and Australian veterinary products companies have expressed significant interest in the results once they are available, in addition to an English nutraceutical products company.

Promotion of the project has occurred through press releases, The Buzz articles and attendance at events, including the IFT expo. Radio host Anita Stewart may also serve the mint to a collection of media personalities at a high profile breakfast at the Vancouver Olympics.

Veterinary Clinical Education Program

Vision

A veterinary clinical educational program that is fundamental to supporting the health and well-being of the province and its citizens.

Mission

To support the economy of Ontario by training professionals skilled in maintaining the health and welfare of animals and their interrelationships with people and the environment.

Capacity and Outreach

OVC and its VCEP program aim to be internationally renowned, accredited and respected leader in training veterinarians skilled in maintaining the health and welfare of animals and knowledgeable about their interrelationship with people and the environment.

The Ontario Veterinary College (OVC) is at an exciting juncture as it moves towards its 150th anniversary in 2012. We continue to advance towards our goal of being a defining voice that integrates animal, human and environmental health.

In March 2009, OVC again achieved full accreditation as determined by the AVMA/CVMA site review team. These two organizations represent the highest standard of achievement for veterinary medical education in the world. In the accreditation process, a veterinary college is reviewed to determine whether it meets 11 accepted standards of quality as developed by the Council of Education of the AVMA. The accreditation process focuses on the Doctor of Veterinary Medicine program and the institutional resources, infrastructure and personnel that support it. An institution or program is deemed fully accredited. Graduation from a fully accredited institution permits graduates to take the national licensure examination for professional practice in Canada and the USA.

The University of Guelph Centre for Public Health and Zoonoses (CPHAZ) was officially launched in May 2008. The Centre (<http://www.ovc.uoguelph.ca/cphaz/>) co-ordinates existing, and promotes new, collaborative, interdisciplinary research activities designed to enhance our capacity to solve problems and implement solutions in public health at the human/animal interface throughout Canada and the world. The initiative brings together a consortium of researchers from the University of Guelph, the Public Health Agency of Canada, the Canadian Cooperative Wildlife Health Centre, the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), the National Laboratory for Zoonotic Diseases and Special Pathogens and others. The Centre supports the advanced education of students, veterinarians and scientists to help meet the growing need for expertise in public health and zoonoses and in sound policy and decision-making in the public health sector.

CPHAZ associated faculty figured prominently in the media in responding to the public's questions and concerns related to the emergence of H1N1 as a potential pandemic disease. Recognition for the Centre was also achieved through the receipt of \$1 million from the Canada Foundation for Innovation's New Initiatives Fund. The funding goes towards infrastructural support for equipment and facilities for the CPHAZ to conduct state-of-the-art research in animal-related aspects of public health, particularly zoonotic diseases.

Clinical Training Programs

- Graduate competent veterinary professionals with skills in maintaining the health and welfare of animals who will meet the needs of Ontario's animal populations at the people-animal-environmental interface.

OVC's veterinary students continued the long-standing tradition of achieving a very high success rate on the licensing exam resulting in a high rate of post-graduate employment and very high employer satisfaction with our new graduates. The North American Veterinary Licensing Exam (NAVLE) is a requirement for obtaining licensure in order to practice veterinary medicine. Successful completion ensures portability of licensure to essentially anywhere in the world. Our graduates are highly sought after by employers and virtually all of those seeking positions found jobs within a few months of graduation. Our annual employer surveys of new graduates showed a continued trend of high satisfaction with these new veterinarians.

Post-Graduate Training Programs

- Highly respected post-graduate training and continuing education programs raising the standard of veterinary health care and related public health in Ontario.

The Ontario Council on Graduate Studies (OCGS) approved the new Masters in Public Health degree. The Master of Public Health (MPH) program is a 5-semester professional degree with concentration in epidemiology, environmental public health, infectious diseases, and zoonotic, foodborne and waterborne diseases. The MPH program prepares public health students and professionals for careers in which they will address the present and future needs of public health in Ontario, Canada, and internationally. Our graduates will emerge as influential local, national, and international leaders committed to improving quality of life by protecting and promoting the health of their communities and by anticipating and preventing disease from both a policy and a science perspective.

THE OMAFRA/UoFG PARTNERSHIP FINANCIAL REPORT

The financial reporting included in this Annual Report 2008/09 for the OMAFRA / UofG Partnership consists of two sections, as follows:

1. The “Audited Statement of Revenues and Expenses For the fiscal year May 1, 2008 to April 30, 2009”, as submitted to OMAFRA on September 29, 2009 and included here in its entirety.
2. Summary of Revenues and Expenses (Fully Allocated)

This summary shows the **actual revenues and expenses (fully allocated) for fiscal 2008/09 (May 1, 2008 to April 30, 2009) for each of the 4 programs** (Research, VCEP, AFL and AHL) as well as for the ARIO Minor Capital Fund (see note *) funded, as applicable, through:

- the renewed Agreement,
- the New Initiatives fund (the special one-time funding of \$56 million received in March 2008, which the University will spending over five years in support of specific new initiatives in the overall partnership), and
- the Total Partnership (Agreement + New Initiatives).

“Fully allocated” refers to the fact that ‘**indirect costs**’ (such as providing program support services, administrative services such as budget management and human resources functions, and physical plant infrastructure) have been allocated to each individual program using a consistent methodology. This ‘fully allocated’ presentation of costs has been utilized beginning in the 2004/05 Annual Report, at the request of OMAFRA. This format provides a much more informative arrangement of the financial data, and is not subject to the same problems in interpretation of program costs as presented in the years previous to 2004/05. Nevertheless, it is not advisable to use these data for making decisions about incremental allocations/reductions in budget, since such decisions may have variable impact on the direct versus indirect cost bases. For example, reducing ‘Production Systems Research Theme’ expenditures may have less impact than intended, unless the continuing cost of operating the research stations on which the PS Program is built is also part of the decision process.

The second page of this summary shows the **revenues and expenses for the Research Program** itemized for each of 7 Themes, as well as for the Research Stations (broken down by “Operations” and “Utilities, Repairs and Maintenance” see note *) and the HQP (Highly Qualified Personnel) and KTT (Knowledge Translation and Transfer) programs. This summary also shows the Research Stations costs allocated across the 7 Research Themes, thus providing fully allocated totals for expenses by Theme.

Note *: Financial support for upkeep and maintenance of the ARIO-owned lands and facilities (referred to in the Agreement as ARIO-Locations, and consisting of the three regional campuses and 14 other research stations, all 17 of which are managed and operated by the University) is provided for the “Utilities, Repairs and Maintenance” program (generally referred to as O&M, funded within the Agreement) and the “ARIO Capital Fund” (funded outside of the Agreement). This O&M and Capital funding is in addition to the normal day-to-day operation of the livestock and crops research stations (station staffing, inputs such as feed, bedding, fertilizer, seed, etc.) at these 17 locations, which is termed Research Station “Operations” (funded within the Agreement, as shown in the broken out costs within the Research Program summary).

The OMAFRA/UofG Partnership Financial Report - Row Definitions

Revenue	
OMAFRA Agreement	That portion of the total Agreement funding recognized for eligible expenses in the reported fiscal year (May 1, 2008 - April 30, 2009).
OMAFRA - Other	These revenues include OMAFRA funding designated for specific activities as well as the "ARIO Minor Capital" funds received.
Sales of Goods and Services	Sales of services or goods from the Agreement operations and provided to external organizations and clients. This category records revenues for testing services provided to external clients by the two Lab Services divisions, as well as sales of milk, eggs, crops and other farm products from the research stations.
Other Revenue and Interest	Includes interest earned on the net cash flow in accordance with section 14.6 of the Agreement as well as miscellaneous revenues generated within the Agreement operations. The major component of this category is facility rental income for space managed within the O and M budget. Other Revenue may also include sponsorship revenues, recoveries from the disposal of surplus equipment or other miscellaneous program revenues.
Expenses	
Personnel	All salary and employee benefit costs excluding transfers for Research and VCEP faculty costs. (refer to Faculty Pool Costs definition)
Faculty Pool Costs	Agreement funds transferred to the University in support of the salary and benefits costs of University faculty effort toward Agreement priorities. Two "pools" have been established for the Research and VCEP Programs.
Operating	Expenses for all costs other than salary and benefit costs.
Internal Sales & Recoveries	Sales of goods and services or recovery of costs between units <u>within the University</u> , such as Lab Testing performed by Lab Services or research station recoveries for researchers or departments. In addition, the agreement recovers costs where OMAFRA funded operations provide shared support for other activities such as MTCU-funded Diploma Teaching. The charges for these recoveries are normally approved as 'invoices' for services between the specific unit requisitioners and providers within the University. Internal Charges are recorded under "Operating".
Indirect Costs	Includes costs of program support services, administrative services such as budget management and human resources functions, and physical plant infrastructure, which support the overall Agreement or New Initiatives programs, but cannot be attributed as direct costs to specific programs.

Summary 08/09 Actuals - Revenue & Expenses of Entire Agreement by Program

Renewed Agreement: All Programs							
	Object Category	Research	Vet Clinical Education	Agri-Food Lab	Animal Health Lab	ARIO Minor Capital	Total Agreement
Revenue	OMAFRA Agreement	(41,069)	(5,297)	(4,034)	(5,977)	(307)	(56,684)
	OMAFRA Other	(700)	-	-	-	(5,546)	(6,246)
	Sales Goods & Services	(3,457)	-	(9,793)	(3,629)		(16,879)
	Other Revenue & Interest	(2,965)	-	(271)	(266)	(10)	(3,512)
Total Revenue		(48,191)	(5,297)	(14,097)	(9,872)	(5,864)	(83,321)
Expenses	Personnel	20,447	1,806	8,701	7,094	49	38,097
	Faculty Pool Costs	9,915	1,900	-	-	-	11,815
	Operating	11,955	1,486	5,655	3,954	5,815	28,865
	Internal Sales & Recoveries	(3,535)	-	(546)	(1,375)	-	(5,456)
	Indirect Costs	9,409	105	287	199	-	10,000
	Total Expense	48,191	5,297	14,097	9,872	5,864	83,321
Net Expense (Revenue)		-	-	-	-	-	-

New Initiatives: All Programs							
	Object Category	Total Research	Vet Clinical Education	Agri-Food Lab	Animal Health Lab	ARIO Minor Capital	Total New Init.
Revenue	OMAFRA Agreement	(3,197)	(222)	-	(342)	-	(3,761)
	OMAFRA Other	-	-	-	-	-	-
	Sales Goods & Services	-	-	-	-	-	-
	Other Revenue & Interest	-	-	-	-	-	-
Total Revenue		(3,197)	(222)	-	(342)	-	(3,761)
Expenses	Personnel	14	-	-	56	-	70
	Faculty Pool Costs	-	-	-	-	-	-
	Operating	2,262	207	-	222	-	2,691
	Internal Sales & Recoveries	-	-	-	-	-	-
	Indirect Costs	921	15	-	64	-	1,000
	Total Expense	3,197	222	-	342	-	3,761
Net Expense (Revenue)		-	-	-	-	-	-

Con't - SUMMARY 08/09 Actuals - Revenue and Expenses of Entire Agreement by Program

Total Partnership (Renewed Agreement & New Initiatives): All Programs							
	Object Category	Total Research ¹	Vet Clinical Education	Agri-Food Lab	Animal Health Lab	ARIO Minor Capital	Total Partnership
Revenue	OMAFRA Agreement	(44,266)	(5,519)	(4,034)	(6,319)	(307)	(60,445)
	OMAFRA Other	(700)	-	-	-	(5,546)	(6,246)
	Sales Goods & Services	(3,457)	-	(9,793)	(3,629)	-	(16,879)
	Other Revenue & Interest	(2,965)	-	(271)	(266)	(10)	(3,512)
	Total Revenue	(51,388)	(5,519)	(14,097)	(10,214)	(5,864)	(87,082)
Expenses	Personnel	20,461	1,806	8,701	7,151	49	38,167
	Faculty Pool Costs	9,915	1,900	-	-	-	11,815
	Operating	14,217	1,693	5,655	4,176	5,815	31,556
	Internal Sales & Recoveries	(3,535)	-	(546)	(1,375)	-	(5,456)
	Indirect Costs	10,330	120	287	263	-	11,000
	Total Expense	51,388	5,519	14,097	10,214	5,864	87,082
	Net Expense (Revenue)	-	-	-	-	-	-

1. See the following pages; 43 and 44, for the breakout of Research Program by Theme / Sub-program.

Summary 08/09 Actuals – Revenue and Expenses by **Research** Sub- Program

Renewed Agreement: Research													
		Research							ARIO Research Stations		Research		Total
	Object Category	Prod Sys	Prod Dev	Food for Health	Env Sust	Bio-economy	Ag Rural Policy	Emg Mgmt	Operations	Utilities / R&M	HQP	KTT	Research
Revenue	OMAFRA Agreement	(19,769)	(848)	(1,441)	(3,190)	(527)	(787)	(3)	(7,063)	(7,441)	-	-	(41,069)
	OMAFRA Other	(178)	(12)	(18)	(26)	(9)	(11)	-	(323)	(123)	-	-	(700)
	Sales Goods & Services	(61)	-	-	(5)	-	(2)	-	(3,301)	(88)	-	-	(3,457)
	Other Revenue & Interest	(811)	(39)	(65)	(123)	(25)	(31)	-	(930)	(941)	-	-	(2,965)
Total Revenue		(20,819)	(899)	(1,524)	(3,344)	(561)	(831)	(3)	(11,617)	(8,593)	-	-	(48,191)
Expenses	Personnel	6,814	482	353	1,219	203	431	2	8,172	2,771	-	-	20,447
	Faculty Pool Costs	7,509	315	579	1,211	158	143	-	-	-	-	-	9,915
	Operating	370	(195)	73	125	13	82	-	4,758	6,729	-	-	11,955
	Internal Sales & Recoveries	(417)	(9)	(5)	(206)	(2)	(41)	-	(1,781)	(1,074)	-	-	(3,535)
	Indirect Costs	6,543	306	524	995	189	216	1	468	167	-	-	9,409
	Total Expense	20,819	899	1,524	3,344	561	831	3	11,617	8,593	-	-	48,191
Net Expense (Revenue)		-	-	-	-	-	-	-	-	-	-	-	-

New Initiatives: Research													
		Research							ARIO Research Stations		Research		Total
	Object Category	Prod Sys	Prod Dev	Food & Health	Env Sust	Bio-economy	Ag Rural Policy	Emg Mgmt	Operations	Utilities / R&M	HQP	KTT	Research
Revenue	OMAFRA Agreement	(1,266)	(724)	(127)	(453)	(589)	-	-	-	-	-	(38)	(3,197)
	OMAFRA Other	-	-	-	-	-	-	-	-	-	-	-	-
	Sales Goods & Services	-	-	-	-	-	-	-	-	-	-	-	-
	Other Revenue & Interest	-	-	-	-	-	-	-	-	-	-	-	-
Total Revenue		(1,266)	(724)	(127)	(453)	(589)	-	-	-	-	-	(38)	(3,197)
Expenses	Personnel	-	-	-	-	-	-	-	-	-	-	14	14
	Faculty Pool Costs	-	-	-	-	-	-	-	-	-	-	-	-
	Operating	897	513	90	321	417	-	-	-	-	-	24	2,262
	Internal Sales & Recoveries	-	-	-	-	-	-	-	-	-	-	-	-
	Indirect Costs	369	211	37	132	172	-	-	-	-	-	-	921
	Total Expense	1,266	724	127	453	589	-	-	-	-	-	38	3,197
Net Expense (Revenue)		-	-	-	-	-	-	-	-	-	-	-	-

Continued: Summary 08/09 Actuals Revenue and Expenses by Research Sub

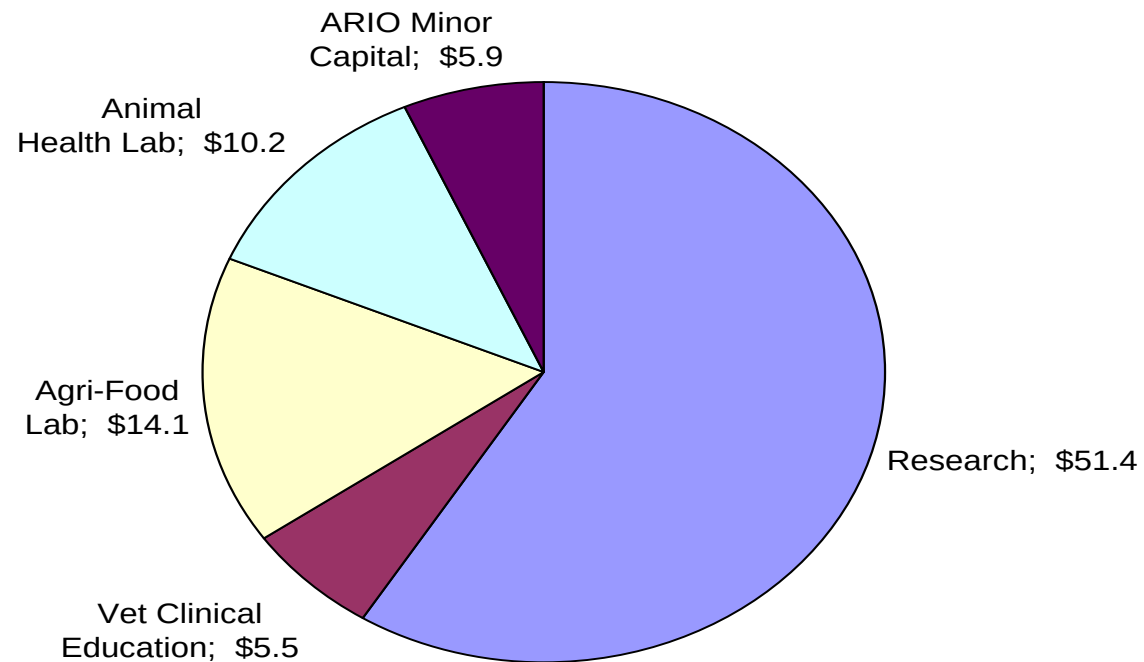
Total Partnership (Renewed Agreement & New Initiatives): Research

		Research							ARIO Research Stations		Research		Total
	Object Category	Prod Sys	Prod Dev	Food for Health	Env Sust	Bio-economy	Ag Rural Policy	Emg Mgmt	Operations	Utilities / R&M	HQP	KTT	Research
Revenue	OMAFRA Agreement	(21,035)	(1,572)	(1,568)	(3,643)	(1,116)	(787)	(3)	(7,063)	(7,441)	-	(38)	(44,266)
	OMAFRA Other	(178)	(12)	(18)	(26)	(9)	(11)	-	(323)	(123)	-	-	(700)
	Sales Goods & Services	(61)	-	-	(5)	-	(2)	-	(3,301)	(88)	-	-	(3,457)
	Other Revenue & Interest	(811)	(39)	(65)	(123)	(25)	(31)	-	(930)	(941)	-	-	(2,965)
Total Revenue		(22,085)	(1,623)	(1,651)	(3,797)	(1,150)	(831)	(3)	(11,617)	(8,593)	-	(38)	(51,388)
Expenses	Personnel	6,814	482	353	1,219	203	431	2	8,172	2,771	-	14	20,461
	Faculty Pool Costs	7,509	315	579	1,211	158	143	-	-	-	-	-	9,915
	Operating	1,267	318	163	446	430	82	-	4,758	6,729	-	24	14,217
	Internal Sales & Recoveries	(417)	(9)	(5)	(206)	(2)	(41)	-	(1,781)	(1,074)	-	-	(3,535)
	Indirect Costs	6,912	517	561	1,127	361	216	1	468	167	-	-	10,330
	Total Expense	22,085	1,623	1,651	3,797	1,150	831	3	11,617	8,593	-	38	51,388
Net Expense (Revenue)		-	-	-	-	-	-	-	-	-	-	-	-

Summary 08/09 Actuals - Fully Allocated Research Program Expenses by Research Sub- Program

	Research							ARIO Research Stations		Research		Total
	Prod Sys	Prod Dev	Food for Health	Env Sust	Bio-economy	Ag Rural Policy	Emg Mgmt	Operations	Utilities/R&M	HQP	KTT	Research
Total Theme Expenses as above:	22,085	1,623	1,651	3,797	1,150	831	3	11,617	8,593	-	38	51,388
Allocation of ARIO Research Station Costs	17,939	-	-	2,203	34	-	34	(11,617)	(8,593)	-	-	-
Fully Allocated Theme Expenses	40,024	1,623	1,651	6,000	1,184	831	37	-	-	-	38	51,388

Summary 08/09 Actuals – Revenue and Expenses of Entire Agreement by Program (\$million's)



PERFORMANCE REPORTS

Performance Indicators for the OMAFRA – U of G Agreement (2008-2018)

Thirty nine performance indicators (PIs) were jointly developed by OMAFRA and the UofG to provide better accountability and transparency of funding under the new agreement. The overarching objective of the PIs was to help ensure maximum return on provincial investment according to OMAFRA core business priorities.

PIs were assigned to the overall agreement and to each of the four program areas: agriculture and food laboratory, animal health laboratory, research and veterinary clinical education. During 2008/09, two PIs were also developed for the joint intellectual property management committee, one of which (R#8) is shared with the research program.

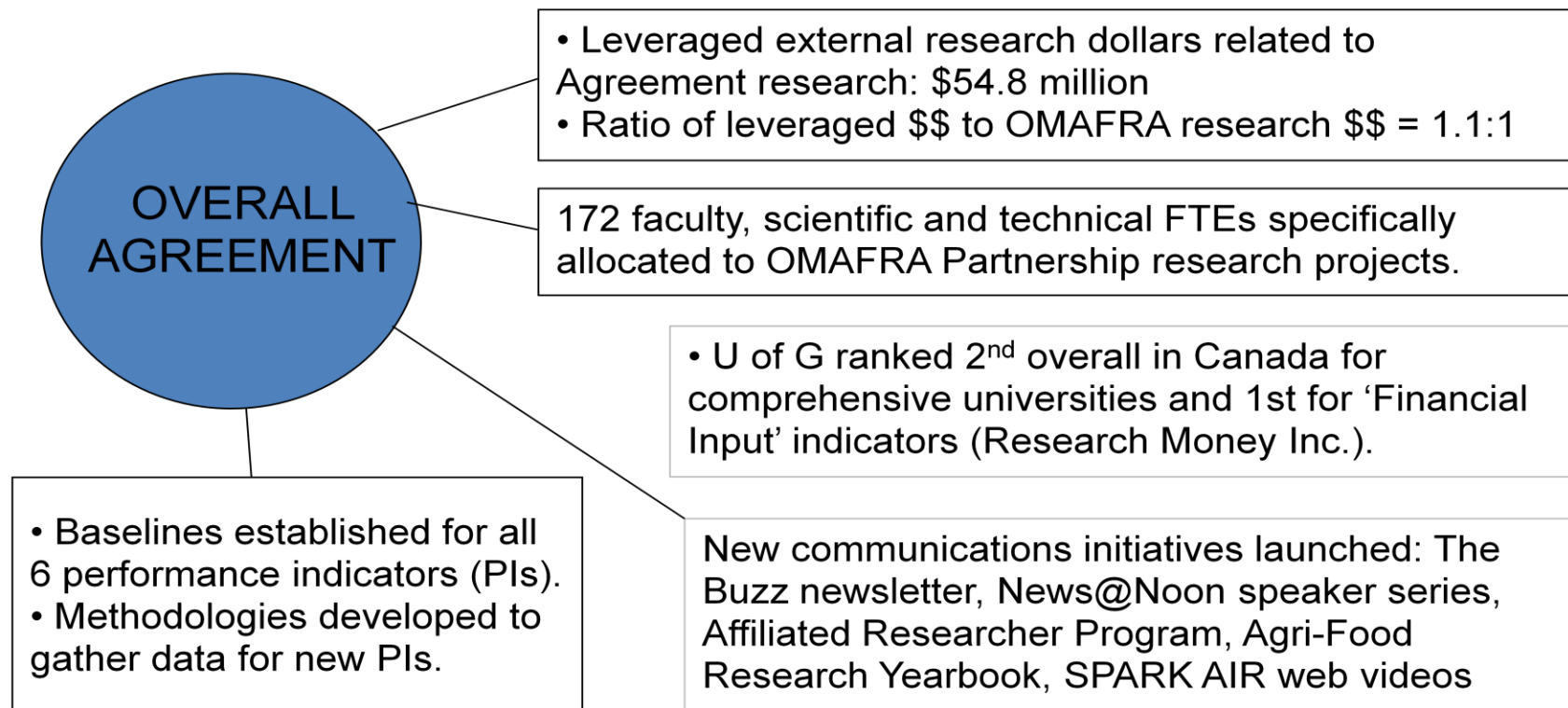
The PIs are both quantitative and qualitative depending upon the most useful reporting format. The 2008/09 program results form the baselines for most of the PIs. Targets for the PIs were set through to the agreement's mid-point in 2013.

Below is a summary of selected PIs and related accomplishments for each of the programs. Further details are provided on the following pages.

OVERALL AGREEMENT

Selected Performance Indicators and Accomplishments

Overall Objective: A world renowned model of government-university collaboration that is instrumental to the success of Ontario's agriculture, food and bioproducts sectors, to the vibrancy of its rural communities, and to the health and well-being of the province, its environment and its citizens.



Overall Agreement Performance Report

Performance Indicators

Data collection and establishment of baselines for each Performance Indicator (PI) was completed with the assistance of OMAFRA. The table below summarizes the Overall Agreement performance according to the six PIs in the Agreement.

Key Outcome	A world class cluster of agriculture, food, bioproduct and rural community resources including academic, government, industry and supplier organizations.	
Performance Indicator OA1	Recognition of the University as a world leader in agri-food, veterinary and associated sciences.	
	Metric (a)	Overall University ranking. Same as R3, metric b)
	Baseline:	The most current (2008) Research Money Inc. report of Canadian universities' standings ranks U of G 2 nd in the 'comprehensive university category.
	Target:	2009-13: Maintenance or improvement of university standing according to the Research Money Inc. ranking of Canadian universities.
	Results (2008/09):	The most current (2008) Research Money Inc. report of Canadian universities' standings ranks U of G 2 nd in the 'comprehensive university category.
	Metric (b)	Total number of scientific and technical FTEs, and faculty supported or leveraged by the Partnership.
	Baseline:	New PI. Scientific and technical FTEs as per 2008/09.
	Target:	2009-13: Maintain total number of scientific and technical FTEs and faculty supported or leveraged by the Partnership at 2008/09 levels. May decline due to inflation.
	Results (2008/09):	Number of faculty, scientific and technical FTEs specifically allocated to OMAFRA Partnership research projects: Research: 171.9 Number of faculty FTEs engaged in projects supportive of OMAFRA priorities (but not allocated to approved OMAFRA Partnership projects) is estimated at 256 'Research' FTEs.

		When these 'Research FTEs' are 'converted' to full faculty FTEs, it is clear that this represents well over 100 full faculty FTEs devoted to research related to Theme priorities (see Research PI 2, metric a). VCEP: 45.9 AFL: 53.0 AHL: 71.0
	Metric (c)	Number of faculty/researchers/staff related to the research theme areas, recognized by their peers, for example through research chairs, awards of recognition, appointment to prestigious positions (international panels) and leadership of national and international research initiatives etc.. (Same as R3, metric a).
	Baseline:	New PI. 25 faculty members in 2008/09 were Canada Research Chairs, of which 10 had active Partnership research projects.
	Target:	2009-13: Number of faculty/researchers/staff recognized by their peers, and significance of awards, appointments etc. to be $\geq$ baseline.
	Results (2008/09):	25 faculty members in 2008/09 were Canada Research Chairs, of which 10 had active Partnership research projects.

Key Outcome	Broader stakeholder community contributing research funding to building capacity for developing solutions to relevant issues and opportunities	
Performance Indicator OA2	Contribution of the Partnership towards leveraging industry and other government funding and collaboration for building capacity to address sector needs, opportunities and issues.	
	Metric (a)	Total dollars invested/generated from third-party sources, by program i.e., AFL, AHL (Same as R1, metric b).
	Baseline:	For 2008/09, total dollars invested from third-party sources were reported below as: • Research: 9.2 million (excluding all Provincial government funding). This is funding secured for research projects from third-party sources. • AHL: 3.6 million • AFL: 9.8 million • VCEP: no revenue generation
	Target:	2009-13: total dollars invested/generated from third-party sources ≥ 2008/09 baselines.
	Results (2008/09):	Research: 9.2 million – see R1b AHL: 3.6 million – see Financial Table on page 40 AFL: 9.8 million – see Financial Table on page 40 VCEP: no revenue generation
	Metric (b)	Total non-OMAFRA program revenue
	Baseline:	2008/09 Baseline number shown below.
	Target:	2009-13: total non-OMAFRA revenue ≥ 2008/09 baselines.
	Results (2008/09):	Research: 6.4 million AHL: 3.6 million AFL: 9.5 million - \$0.3 million from OMAFRA but not related to the Agreement or New Initiatives. VCEP: no revenue generation (Sales of services or goods from the Agreement operations and provided to external organizations and clients. This category records revenues for testing services provided to external clients by the

		two Lab Services divisions, as well as sales of milk, eggs, crops and other farm products from the research stations.)
Key Outcome	Partnership seen as integrative and collaborative	
Performance Indicator OA3	OMAFRA and University staff engagement with OMAFRA/University partnership	
	Metric	Level of overall OMAFRA/UofG staff engagement/satisfaction with overall Partnership
	Baseline:	New PI. Joint staff engagement survey distributed to all OMAFRA and UofG personnel involved with the partnership.
	Target:	2009-13: maintenance or improvement of 2008/09 survey results.
	Results (2008/09):	Question #4 of the survey: <i>Do you feel more engaged in the new Agreement, than in past agreements?</i> Answering 'Definitely' or 'Somewhat': 55% of respondents.
Notes: A brief, seven question survey was emailed to 409 OMAFRA and U of G personnel associated with the partnership to assess the level of staff engagement after the first year of the new agreement. The survey was conducted by an external contractor using an alias email address (omafra-uofg@rkd.ca), to ensure anonymity and confidentiality of the results. Highlights include: 29% of recipients completed and returned the survey. 65% of respondents identified 'research' as the area in which they worked. 55% felt 'definitely' or 'somewhat' more engaged in the new agreement, than in past; 26% were neutral 60% felt 'very' or 'somewhat' satisfied with the overall management of the agreement; 24% were neutral 54% felt 'very' or 'somewhat' satisfied with the governance; 21% were neutral 51% felt 'very' or 'somewhat' satisfied with the accountability; 23% were neutral 76% felt their work under the agreement would be 'definitely' or 'somewhat' beneficial to their clients; 20% were neutral. 88% felt the communications was 'very good' or 'good/ neutral' (Formatting error by contractor merged the two categories). 293 comments and suggestions were received, which will be reviewed and forwarded to the program co-chairs for consideration. .		

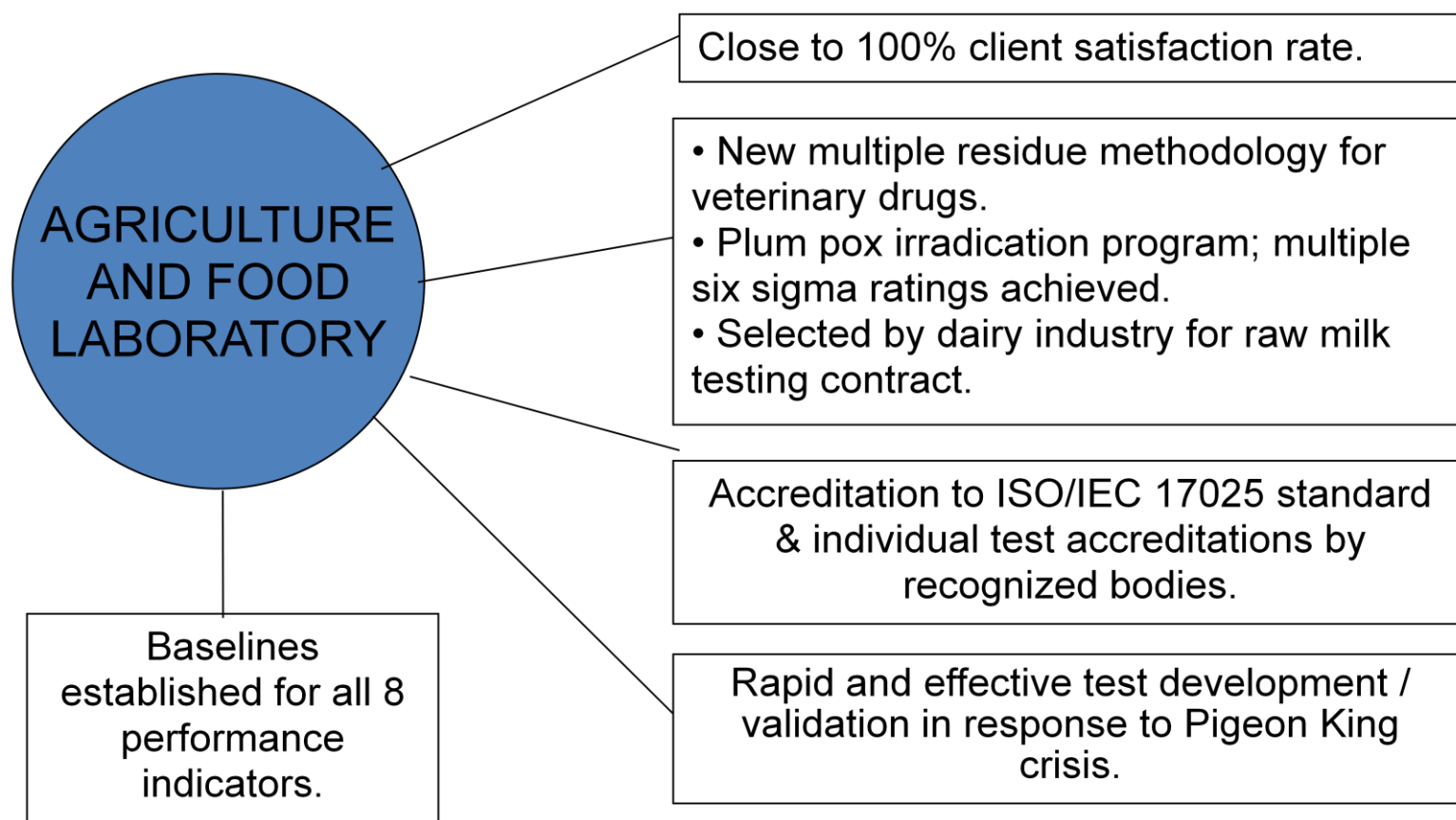
Key Outcome		Leading edge solutions to agriculture, food, bioproduct, animal health and rural community issues and opportunities
Performance Indicator OA4	Revenue generated from solutions, products and services developed through the Partnership	
	Metric	Outcomes and PIs outlined for OA4, 5 and 6 will be assessed as part of the overall 5-year evaluation of the Partnership, to be conducted by an external third party.
	Baseline:	PIs OA4, 5 and 6 will be achieved through a study similar to the Deloitte report of 2007 (UofG / OMAFRA Impact Study), to be conducted in 2012. In the interim, the Deloitte study serves as the baseline.
	Target:	2009/10: Evaluation plan for year five to be undertaken and approved in 2009-10, describing content and format of 2012-13 report.
	Results (2008/09):	Examples of 2008/09 results that will contribute to OA4: • R8b data to measure the revenue, innovation and commercial benefits generated... • Joint IP1 case study: Proof of Principle fund investment
Key Outcome		Economic and health benefits generated from adoption, utilization and commercialization of knowledge and capacity
Performance Indicator OA5	Economic and health benefits from solutions, products and services developed through the Partnership	
	Metric	Outcomes and PIs outlined for OA4, 5 and 6, will be assessed as part of the overall 5-year evaluation of the Partnership, to be conducted by an external third party.
	Baseline:	PIs OA4, 5 and 6 will be achieved through a study similar to the Deloitte Study – 2007 (UofG / OMAFRA Impact Study), to be conducted in 2012. In the interim, the Deloitte study serves as the baseline.
	Target:	2009/10: Evaluation plan for year five to be undertaken and approved in 2009/10, describing content and format of 2012-13 report.

	Results (2008/09):	Examples of 2008/09 results that will contribute to OA5: • R5 case studies - one from each of the seven research theme areas - concerning benefits to the economy, environment and health ...generated from the research program • AHL5 case studies: effective and timely diagnosis and reporting of significant animal health events • AHL8 case studies: emergency response plans implemented. • AFL 3 data: track and review incident reports (LabTrack) and report all non-conformances, resolution and continuous improvement initiatives • AFL5 case studies: scientific application of existing or new methods to meet unanticipated urgent incidents in reasonable time
Key Outcome	Key stakeholders aware of economic and social benefits of solutions led by the Partnership	
Performance Indicator OA6	External stakeholder satisfaction with benefits and accomplishments of the OMAFRA/UofG Partnership	
	Metric	Outcomes and PIs outlined for OA4, 5 and 6 will be assessed as part of the overall 5-year evaluation of the Partnership, to be conducted by an external third party.
	Baseline:	PIs OA4, 5 and 6 will be achieved through a study similar to the Deloitte Study – 2007 (UofG / OMAFRA Impact Study), to be conducted in 2012. In the interim, the Deloitte study serves as the baseline.
	Target:	2009/10: Evaluation plan for year five to be undertaken and approved in 1009/10, describing content and format of 2012-13 report.
	Results (2008/09):	Examples of 2008/09 results that will contribute to OA6: • R10 data: number of media clippings and key stakeholder communications • R9 case study: stakeholder assessment of research outcomes on the industry (to be assessed in 2012-13. • R7a & b data: number of knowledge transfer events and examples of utilization of new knowledge by stakeholders • AHL4 data: Client Satisfaction Survey results • AFL3 data: Client Satisfaction Survey results

AGRICULTURE & FOOD LABORATORY

Selected Performance Indicators and Accomplishments

Program Objective: Scientific, diagnostic and analytical capacity to detect risks and enable effective response to support the health and well being of the province and its citizens



Program Performance Reports

Agriculture and Food Laboratory

Performance Indicators

Data collection and establishment of baselines for each Performance Indicator (PI) was completed with the assistance of OMAFRA. The table below summarizes AFL's performance according to the eight PIs in the Agreement.

Key Outcome	Highly qualified & skilled lab personnel and up to date methods & equipment Improved lab and food safety technology and practices.	
Performance Indicator AFL1	Maintain required accreditations, proficiency testing and ISO registration to ensure a continuous quality improvement program is applied to laboratory operations.	
	Metric	Summary reports of accreditation and proficiency reports
	Baseline:	Accreditation to by the ISO/IEC 17025 standard. Individual test method accreditation by recognized bodies e.g. Standards Council of Canada (SCC), Canadian Association for Laboratory Accreditation (CALA). Maintenance of proficiency for individual test methods per program availability.
	Target:	2009 – 2013: Maintenance of accreditation
	Results (2008/09):	LS, including AFL, is accredited by both of Canada's internationally recognized accrediting bodies, Standard Council of Canada (SCC) and the Canadian Association for Laboratory Accreditation (CALA) to the ISO/IEC 17025 standard. LS/AFL is accredited by SCC in two program specialty areas, Agriculture Inputs, Food, Animal Health and Plant Protection (AFAP) and Test Method Development, Evaluation and Non-routine Testing (TMDENRT). In May 2008, LS had 153 scope listings including 149 tests in AFAP and 4 procedures in TMDENRT. Of these, 146 tests are normally performed by AFL and 8 by Animal Health Laboratory. Of the 21 tests performed for the Horticultural and Agricultural Land Use and Environmental Management programs, 14% or 3 tests have associated PT. Forty two (42) PT results were reported and 100% were classified as satisfactory.

Key Outcome	Scientific & statistical integrity of routine analytical test data.	
Performance Indicator AFL2	Proportion of completed tests that meet quality, sample integrity and service level standards.	
	Metric	Percentage / Level of compliance with service level standards, reported by program, related to: • Turnaround times for screenings and confirmation • Corrected reports • Non conforming samples
	Baseline:	98% compliance met.
	Target:	2009 – 2013: maintain 98% compliance with service level standard
	Results (2008/09):	The Agriculture and Food Laboratory has met or exceeded the requirement to achieve: • turn-around time for test results 98% of the time over the full fiscal year 2008-2009. • Corrected reports - 98% compliance met • Non-conforming samples – 98% compliance met
Key Outcome	Strong linkages built to ensure effective sharing of information and to communicate violative / actionable test results to stakeholders in a timely manner.	
Performance Indicator AFL3	Track and review incident reports (LabTrack) and report all non-conformances, resolution and continuous improvement initiatives.	
	Metric	LabTrack reporting of all non-conformances
	Baseline:	See 2008/09 results below.
	Target:	2009 – 2013: maintain 2008/09 levels Target is to reduce incidents every year.
	Results (2008/09):	34 incidents were reported during the processing/ testing/ reporting of 389,770 samples. (<0.01% of samples affected) 4/34 incidents resulted from OMAFRA non-conformance, 30/34 incidents were non-conformances of AFL.

		One trend was identified – the implementation of a new computer system contributed to increased reporting issues due to unfamiliarity of staff with the new system. Additional staff training and experience with the new system is demonstrating elimination of issue.
Key Outcome	Ability and capacity to detect and confirm positive test results to provide effective response to food contamination incidents and other serious plant and environmental hazards with severe human health or economic consequence.	
Performance Indicator AFL4	Level of compliance with communication requirements in the lab testing and sampling protocols.	
	Metric	LabTrack reporting of all non-conformances.
	Baseline:	2008/09 results below be the baseline.
	Target:	2009 – 2013: maintain 98% compliance with service level standard
	Results (2008/09):	4 incidents of non-compliance with the communication requirements established in the lab testing and sampling protocols. 4 incidents affecting 11 of 389,770 samples (<0.01%)
Key Outcome	Ability and capacity to detect and confirm positive test results to provide effective response to food contamination.	
Performance Indicator AFL5	Response to unanticipated urgent incidents in a reasonable timeframe using new or existing technologies.	
	Metric	Evaluation/case study of AFL's responses to urgent/serious food safety events that required the development of new tests in order to assess AFL's response to these tests
	Baseline:	One major case study completed (Pigeon King).
	Target:	One Case study provided annually.
	Results (2008/09):	AFL met the expectation of OMAFRA in the timely delivery of new methodology (MRD) for testing samples during an unanticipated entry of squab meat into the marketplace in July of 2008.

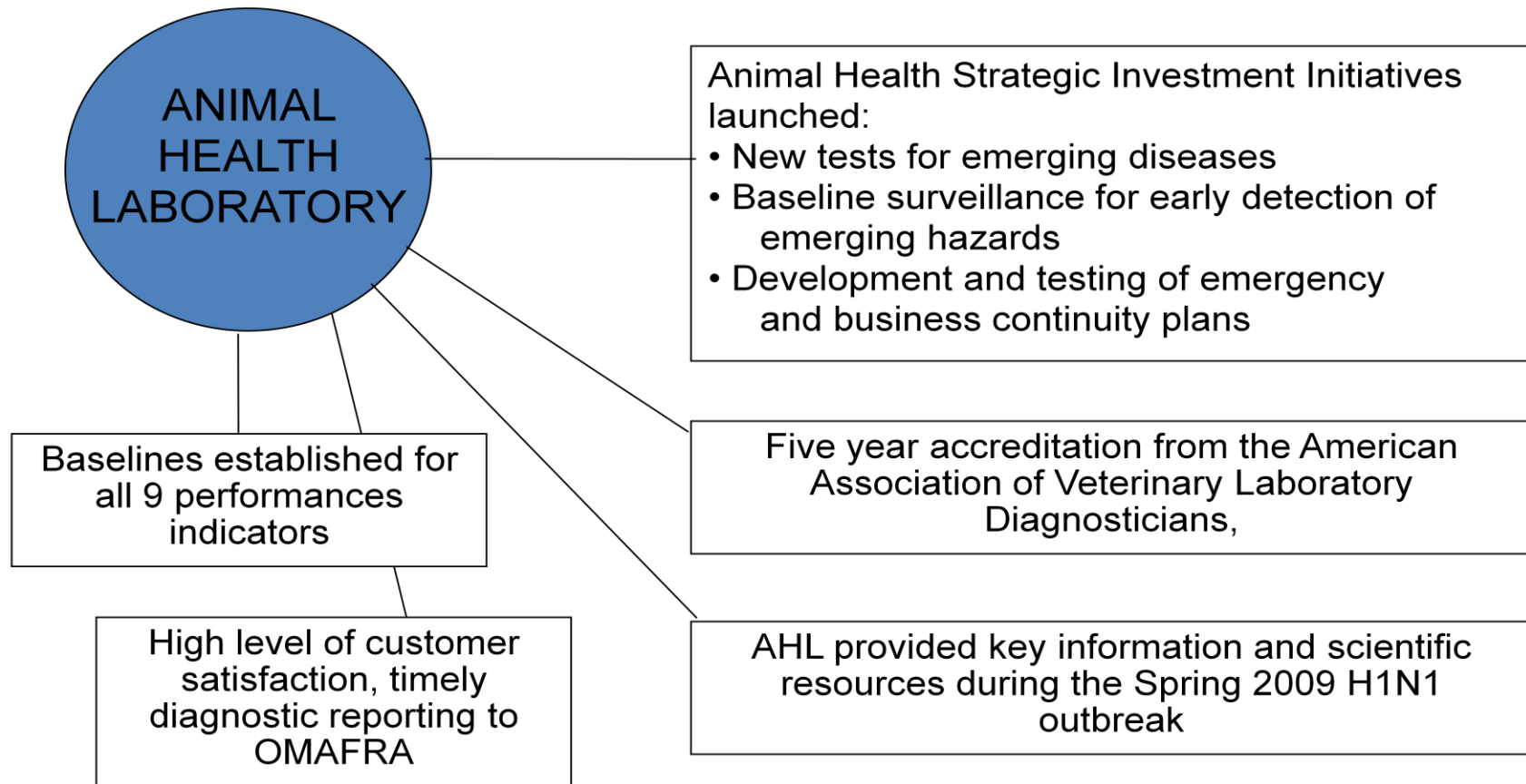
Key Outcome	Quality, timely, reliable results supported by required accreditation.	
Performance Indicator AFL6	Level of compliance with sampling and testing requirements as described in the annual testing plan agreements.	
	Metric	Percent compliance with testing requirements as specified in annual testing and sampling plans, by program (Schedule F).
	Baseline:	Baseline is service level standard of 98%.
	Target:	2009 – 2013: maintain 98% compliance with service level standard
	Results (2008/09):	• 99.6% of all samples submitted were analysed by the AFL. • OMAFRA collected 389,770 samples versus the forecasted 405,193 (96%) in the OMAFRA annual testing and sample plans.
Key Outcome	Capacity to support coordinated and effective emergency management. Timely and effective response to unanticipated/urgent testing requirements and food safety, environmental health and plant health/pest emergencies.	
Performance Indicator AFL7	Effective response to food safety, environmental health and plant health/pest emergencies and unanticipated/urgent situations and, where possible, periodically tested to address food safety and plant and environmental hazards.	
	Metric	Evaluation/case study of all AFL management of significant/unanticipated/urgent situation of environmental health and plant/pest emergencies.
	Baseline:	One major case study completed (Pigeon King).
	Target:	Case study to be provided annually.
	Results (2008/09):	AFL met the expectation of OMAFRA in the timely delivery of testing under urgent circumstances during an unanticipated entry of squab meat into the marketplace in July of 2008.

Key Outcome	Improved U of G research through laboratory-based expertise.	
Performance Indicator AFL8	Contribution of AFL or University personnel or students to articles and final project reports presented or published.	
	Metric (a)	Total number of publications in peer reviewed journals and/or final project reports presented, related to OMAFRA strategic research themes.
	Baseline:	2008/09 results below is the baseline
	Target:	Target will be set when 2008/09 baseline known.
	Results (2008/09):	Thirteen (13) papers/presentations were submitted and/or presented in support of the OMAFRA strategic research themes.
	Metric (b)	Summary of knowledge transfer events re new practices, including number of attendees.
	Baseline:	2008/09 results below is the baseline.
	Target:	2009 – 2013: maintain 2008/09 levels.
	Results (2008/09):	Four (4) knowledge transfer events: • 2 Molecular Biology Workshops; approx 100 attendees. • 1 Pesticide Risk Assessment Seminar: 4th Year Public Health Program; approx. 50 attendees.

ANIMAL HEALTH LABORATORY

Selected Performance Indicators and Accomplishments

Program Objective: Surveillance, emergency response and method development capacity to support Ontario's animal health system and the health and well being of the province and its citizens



Animal Health Laboratory

Performance Indicators

Data collection and establishment of baselines for each PI was completed by the end of August, 2009, with the assistance of OMAFRA. The table below summarizes AHL's performance according to the 9 PIs in the Agreement. To the extent possible, data collection and analysis was used to develop numeric performance metrics. While most of these PIs have supporting documentation, some include narratives, which provide additional information and perspective on the PI results. This supporting documentation is available upon request.

Key Outcome	Contributes effectively to developing and implementing an animal health strategy for Ontario/Canada	
Performance Indicator AHL1	Participation in and contribution of surveillance information to relevant national and provincial bodies or committees that inform Federal/Provincial animal health strategies	
	Metric:	a) The number of faculty and/or staff participating on federal/provincial animal health strategy committees (Note: this metric was reported but no target was generated for it, as new metric c) was felt to be more meaningful.) b) Level of customer satisfaction with services provided by AHL Program, by commodity (Note: this portion of the metric was consolidated into AHL4, which addresses customer satisfaction.) c) Percentage of available working time spent participating on federal/provincial animal health strategy committees (Note: this metric was added, as it was felt that it was a more meaningful measure than strictly the number of staff participating.)
	Baseline:	All 17 AHL vets/supervisors participated on federal and/or provincial animal health strategy committees and 13 attended meetings or conferences for these committees in 2008/09. Average per staff member = 2.3% of available working time
	Target:	2009-2013: 1.5% – 3.0 % of available working time
	Results (2008/09):	8 of 17 AHL vets/supervisors participated in 66 meetings of 13 international and national organizations (total 319 hrs). 11 of 17 AHL vets/supervisors participated in 92 meetings of 17 provincial organizations (total 401 hrs). In total, all 17 AHL vets/supervisors participated on federal and/or provincial animal health strategy committees and 13 attended meetings or conferences for these committees in 2008/09.

		Average hours per staff member: 42.4 meeting hours per year = 2.3% of available working time Supported by a table (compiled yearly) of AHL staff participation in national and provincial committees and scientific meetings. The table also includes information regarding AHL staff holding officer roles in these organizations. One international organization is included (AAVLD, staff with committee roles ONLY), as participating in this capacity contributes to international and thus, national policy. As requested, this tabulation was limited to national and provincial bodies or committees to which AHL veterinary staff members belong. Many AHL staff are also members of various international organizations and local organizations, which have not been included (with the exception of AAVLD). This table is available for review on request. Involvement in national initiatives has been beneficial to the AHL and to OMAFRA by allowing AHL staff to bring an Ontario perspective to the table – for example, considerable time has been invested in the Animal Health Science Agenda/Foresighting project (CFIA lead is Dr. Shane Renwick), which has created and discussed possible future scenarios and strategies for dealing with these situations. Participation in the Canadian Animal Health Surveillance Network (CAHSN) has been most useful in helping to train and equip the AHL staff to deal with a foreign animal disease at an enhanced level of preparedness – also a key feature of the new OMAFRA/UofG Agreement. Participation in the large number of provincial and national veterinary organizations provides an opportunity to interact with private practitioner colleagues and industry and brings a laboratory perspective on issues of the day that impact or inform policy development, e.g., Johne's disease initiatives, Canadian Farmed Animal Health and Welfare Strategy, and the proposed Ontario Animal Health Legislation. As core members of the Ontario Animal Health Surveillance Network (OAHSN), the AHL and OMAFRA exchange and integrate information from many sources such that OAHSN serves as a cornerstone of the larger Ontario Animal Health System and related public health. The OAHSN specialists maintain links to other disease surveillance sources in other provinces, as well as at national and international levels.
--	--	---

Key Outcome	Acts as a critical resource effectively contributing to animal health policy development and in ongoing program delivery for OMAFRA	
Performance Indicator AHL2	Case mix reflects the diversity of endemic disease by animal species and geographic distribution of farms across the province	
	Metric:	a) Occurrence of specific endemic diseases identified through laboratory testing, reported by geographic area & commodity b) Occurrence of specific endemic diseases (by geographic area & commodity) identified through laboratory testing compared to targeted studies.
	Baseline:	Establishment of baseline dependent on new capabilities potentially supported under the proposed Animal Health Act.
	Target:	Establishment of target dependent on proposed Animal Health Act.
	Results (2008/09):	NA Dependent on new capabilities potentially supported under the proposed Animal Health Act.
Key Outcome	Acts as a critical resource effectively contributing to animal health policy development and in ongoing program delivery for OMAFRA	
Performance Indicator AHL3	Proportion of farm animal veterinary practices using AHL services by geographic area across the province	
	Metric:	Percentage of veterinarians accessing/utilizing laboratory services, by commodity and geographic area.
	Baseline:	<u>By Commodity:</u> Equine (EQ): 70% Food Animal (FA): 73% <u>By Geographic Area:</u> North Area Code 705: 69% Area Code 807: 17% East Area Code 613: 78% Average: 64%

		Central Area Code 416: 60% } Area Code 905: 58% } West Area Code 519: 66% } Average: 59%
	Target:	2009-2013: ≥ 65% for each commodity; ≥ 60% for each region
	Results (2008/09):	<u>By Commodity</u> Equine = 171/246 (70%) Food Animal = 167/228 (73%) <u>By Geographic Area (Area Code)</u> North Area Code 705 = 38/55 (69%) } Area Code 807 = 1/6 (17%) } (Average: 64%) East Area Code 613 = 46/59 (78%) Central Area Code 416 = 6/10 (60%) } Area Code 905 = 49/84 (58%) } West (Average: 59%) Area Code 519 = 108/163 (66%) Commodity (Equine and Food Animal) analysis is based on all Ontario accredited facilities identified as EQ or FA (respectively) in the CVO database, plus all other clinics which have submitted EQ or FA samples (respectively) to the AHL. Note: On the surface, the commodity analysis is misleading, as in actual fact, the AHL services a much higher percentage of FA practices in Ontario than is reported here, i.e., should be close to 100%. The root of the difference between the reported percentage and the actual percentage is a result of the fact that many companion animal clinics hold food animal certifications for the purposes of dispensing medication but do little to no actual work with food animals. As a result, the denominator is artificially large with a resulting lower percentage. Work will be conducted in FY 2009/10 in an effort to increase the accuracy of this calculation. Geographic analysis is based on all Ontario accredited facilities identified as EQ and/or FA in the CVO database, plus all other clinics which have submitted EQ or FQ samples to the AHL, and is presented by region, using telephone area code.

Key Outcome	A key node within a formal network of animal health professionals, providing a critical link to the North American flow of diagnostic information for surveillance and risk assessment	
Performance Indicator AHL4	Timely communication of relevant changes in the patterns of existing disease or the appearance of new disease to veterinary practices, producers and industry groups	
	Metric:	Level of customer satisfaction with services provided by AHL program, by commodity.
	Baseline:	Client Satisfaction: 93% satisfaction rating
	Target:	2009-2013: ≥ 90 % satisfaction rating
	Results (2008/09):	<i>Question 11: Communication of relevant changes in disease occurrences is timely.</i> 50 of 54 (93%) clients responding to this question were satisfied with the timeliness of communication of relevant changes in disease occurrences. Analysis of results from yearly AHL client satisfaction survey question 11. Based on the above question, clients were asked to rate the AHL numerically between 5 (for Always) to 1 (for Never). Satisfaction rating compares the favourable responses (3/5 or better) to the total number of clients responding. According to the AHL Client Survey responses it is evident that most users are satisfied.
Key Outcome	Early detection and effective response to foreign animal diseases and other serious diseases with human/animal health or economic consequences	
Performance Indicator AHL5	Effective and timely diagnosis, support and reporting of diagnostic results to OMAFRA, in the investigation and response to suspected foreign animal and other serious human/animal diseases	
	Metric:	a) Evaluation/case study of AHL response to “*significant animal health events” such as suspected foreign animal and other serious human/animal disease (*) as defined by OMAFRA b) Utilization of AHL lab by third-party sources (Note: reporting on this metric will be very general to ensure client confidentiality and market competitiveness and no target will be set.)
	Baseline:	OMAFRA satisfaction of AHL detection and response in case studies.

	Target:	2009-2013: satisfactory handling of all cases by AHL
	Results (2008/09):	The AHL selected three cases from their 2008-2009 case work, with potential significance to animal health. The three cases were 1) presumptive FMD, 2) ILT and 3) EEEV. Evaluation of the submitted AHL case studies found that each had been handled effectively according to established criteria. The AHL was used by approximately 100 third-party sources (i.e., excluding OMAFRA and Ontario veterinary clinics), including 3 federal, 3 Ontario ministries , 9 non-Ontario provincial governments, and approximately 85 other private organizations ranging from other diagnostic laboratories, to large FA producers, to genetic and cell line companies. OMAFRA experts evaluated the 3 case studies to assess AHL performance vs. standard criteria: timeliness, effective diagnosis, efficient communication and reporting of test results to the client and OMAFRA, follow-up actions required and final resolution of the case. This may highlight deviations which once identified will support continuous improvement at the AHL. Excerpts from the OMAFRA evaluation are as follows: “In my view AHL deserves an A+ grade for their performance and handling of this suspected FAD. Their diagnosis was effective and timely, as was their notification of OMAFRA and the CFIA.” “... it is clear that the timely diagnosis and reporting of the case, communication with the OMAFRA designated person, working with and supporting the private [redacted] veterinarian associated with the case was done at a very satisfactory level by the AHL staff.” “... gaps were related to the communication protocol which had been developed shortly before the case occurred.” “Timely and effective diagnosis - The tests ordered were appropriate for the history of the case.” “Results were communicated to the appropriate individuals and agencies in a timely manner.” Each complete case description and narrative prepared by the AHL (along with the case evaluations by OMAFRA staff) is available upon request.

Key Outcome	Diagnostics/tests meet best practice standards	
Performance Indicator AHL6	The University maintains appropriate accreditations at the Animal Health Laboratory, but not limited to AAVLD, CFIA and ISO registration	
	Metric:	a) Review of accreditation reports in order to assess performance and maintenance of accreditation b) Review of client satisfaction survey in order to assess performance c) Review of actual adherence to published turnaround times (TATs) d) Review of proficiency testing results to assess performance (Note: metrics b, c and d were added since client satisfaction, adherence to published TATs, and proficiency testing results are taken into consideration during accreditation and have a bearing on best practices)
	Baseline(a):	2008-2009 AHL accreditations & certifications
	Target:	2009-2013: maintenance of accreditations & certifications
	Results (2008/09):	AHL maintained all relevant and required Accreditations and Certifications, including ISO 9001 registration, American Association of Veterinary Laboratory Diagnosticians (AAVLD) accreditation, ISO/IEC 17025 accreditation and Canadian Food Inspection Agency (CFIA) accreditation. Supported by a complete narrative of AHL participation in accreditation visits and audits.
	Baseline(b):	AHL Client Satisfaction: 96% satisfaction rating
	Target:	2009-2013: ≥ 90 % satisfaction rating
	Results (2008/09):	<i>Question 1: Employees respond in a timely manner</i> <i>Question 4: Published turn-around times are met</i> 64 of 66 (97%) clients responding to survey question 1 were satisfied with the timeliness of employee response. 61 of 64 (95%) clients responding to survey question 4 were satisfied that published turn-around times were met. Turnaround time is one of the most critical measures of a laboratory's effectiveness and efficiency. Client loyalty is often based on this one aspect of service. Given that there are a large number of tests and services provided, it is often a challenge to maintain TAT and manage clients'

		expectations. Client access to the AHL Client Services Vet is also seen as a very positive component of improved client service. A representative client comment from the AHL client satisfaction survey (part of question 26) is included below: “We recently returned to AHL from (<i>private lab</i>), not happy with (<i>private lab</i>) for cost and communications.” However, not all clients are completely satisfied: “Improve services for large batches, extra runs we rarely set up when needed. Results are rarely finished when required by clients.” Analyses of results from the yearly AHL client satisfaction survey questions 1 and 4 deal with TAT and employee responsiveness and are used for this PI. Based on reporting of test results, data and TATs, clients were asked to rate these survey questions numerically between 5 (for Always) to 1 (for Never). Satisfaction rating compares the favourable responses (3/5 or better) to the total number of clients responding to the relevant survey question.
	Baseline(c):	Adherence to Actual TATs: 97.5% of all testing meets published TAT
	Target:	2009-2013: ≥ 95% adherence to published TAT
	Results (2008/09):	297869 of 305587 (97.5%) individual tests conducted met the published TAT. Supported by a table (compiled yearly) of AHL turnaround statistics, which is available for review upon request. (Note: this year’s results are only based on data from Dec. 1, 2008 to April 30, 2009. Data prior to this time could not be accessed due to upgrades to the LIMS.) Actual turnaround times were analyzed from data available in the AHL LIMS. A component of the recent certification of the AHL by the AAVLD was an analysis of the adherence to quoted TAT expectations as published in the AHL Fee and Users Guide.
	Baseline(d):	Performance on Proficiency Test Panels : Biological Panels: 98% pass rate Chemistry Panels: 95% satisfactory 3% questionable 2% unsatisfactory

	Target:	<u>Biological Panels:</u> 2009-2013: ≥ 95% pass rate <u>Chemistry Panels:</u> 2009-2013: ≥ 95% satisfactory rating
	Results (2008/09):	<u>Biological Panels</u> In 2008/09 AHL participated in 13 biological proficiency testing (PT) programs, analyzing 61 panels. 60 of 61 (98%) proficiency panels passed <u>Chemistry Panels</u> In 2008/09 the chemical sections of AHL, Clinical Pathology and Toxicology/ Soil & Nutrient, participated in 22 PT programs, reporting over 2000 chemical PT results. Of these 2000 results: 1892/2000 (95%) were deemed satisfactory 62/2000 (3%) were deemed questionable 46/2000 (2%) were deemed unsatisfactory Supported by a table (compiled yearly) of AHL participation in proficiency panel testing. This table is available for review upon request. AHL participated in 35 proficiency test programs in 2008/09. PT programs can be divided into 2 main categories: 1. Biological programs – a panel of samples are tested, or identification agrees with consensus ID and results are usually pass/fail. 2. Chemical programs which produce a numerical result and the results are usually categorized as satisfactory, questionable and unsatisfactory. When a PT result is identified as questionable or unsatisfactory, the problem is investigated, corrective action applied and documented. A summary of chemical PT results is available for onsite review.
Key Outcome	Capacity and capability in place to provide coordinated and effective emergency management	
Performance Indicator AHL7	The University maintains an appropriate range of diagnostic specialties, anatomic pathology services and other technologies	
	Metric:	Level of customer satisfaction with services provided by AHL program, by commodity
	Baseline:	AHL Client Satisfaction: 98% satisfaction rating
	Target:	2009-2013: ≥ 90 % satisfaction rating

	Results (2008/09):	<i>Question 5: Enquiries are handled well.</i> 91% of clients were delighted or pleased with how enquiries are handled while 8% described it as adequate Satisfaction rating: 98% <i>Question 7: Test results assist in problem solving.</i> More than half of respondents are delighted with this category while another 41% are pleased. Satisfaction rating: 100% <i>Question 12: The services provided by AHL meet your organization's needs</i> 89% of clients were delighted or pleased with the services while 9% described them as adequate. Satisfaction rating: 98% <i>Question 14: What has been your average overall level of satisfaction with service from the AHL?</i> 81% of clients were delighted or pleased with the services while 17% described them as adequate Satisfaction rating: 98% <i>Question 15: Will you continue to use the services of the AHL?</i> <i>Question 16: Would you recommend the AHL to others?</i> 95% of clients responded YES to the above two questions. Overall, 98% of AHL clients responding to the survey were satisfied with the range of diagnostic services provided. Analysis of results from yearly AHL client satisfaction survey questions 5, 7, 12, 14, 15, and 16. Satisfaction rating compares the favourable responses (3/5 or better, or "Y" responses to Y/N/maybe questions) to the total number of clients responding to the relevant survey question. Client responses (as above) show an across the board high level of satisfaction with AHL services. There are some areas for improvement and a number of these were identified by a few clients anonymously (question 26). For example the following comment could likely be considered representative of a number of current AHL clients: <i>"Continue with efforts of improving our awareness of the testing available and telling us how to use it best. I have discussed the need for updates, lectures, wet labs etc that might aid in increasing our knowledge and better use of testing that is available. A workshop on a particular theme might be applicable i.e., respiratory disease or enteric diseases and cover many species. This would be very beneficial to the mixed animal practitioner. Possibly starting with proper pm techniques, and samples."</i>
--	-----------------------	--

Key Outcome	Impacts associated with animal health incidents minimized	
Performance Indicator AHL8	Emergency response plans are effectively implemented in response to emergency animal health incidents	
	Metric:	a) Evaluation /case study of all AHL responses to significant emergency animal health incidents (Note: As AHL5 is exclusively based on evaluation of 3 case studies regarding AHL response to significant animal health incidents, it was felt that this metric was addressed in AHL5) b) Adherence to the milestones in Schedule G of the OMAFRA/U of G Agreement (Note: it was felt that this PI would be better served by using this new metric.)
	Baseline:	Year 1 Milestone as defined in Schedule G of the Agreement was achieved
	Target:	2009-2013: As defined in Article 4.3 (years 2 to 5 milestones for AHL program) Schedule G of the Agreement
	Results (2008/09):	Year 1 Milestone (AHL HIRA report) was completed by April 1, 2009. The Business Service Baseline Inventory (BSBI) template was used by the AHL to gather the necessary baseline information for establishing specific time-critical business functions and critical infrastructure (at the macro level). For each separate lab, business and services were identified broadly (or as operationally realistic). In some cases similar services are delivered by the same team of employees, who may utilize the same or similar resources and inputs. To the extent possible, work areas with commonalities (i.e. in the same location) were identified once and described as a group of services and named accordingly. In addition, the inventories captured a general outline of the client base for each service and listed critical equipment dependencies (IT and infrastructure) that each service depends on. Once the BSBI was complete, the OMAFRA and AHL staff undertook the HIRA part of the exercise. The HIRA was used to identify areas of potential vulnerabilities and to identify the areas at greatest risks to the laboratories and, by extension, to clients and clients (OMAFRA included). All the hazards which potentially could cause an interruption in service delivery were assessed. This process used an international standard listing of 37 hazards. The AHL HIRA report is available for review on request. Year 2 milestones continue with a business services risk assessment and notification drill. Since the AHL will be moving to a new building in August 2010, work on some of the Year 2 milestones may be deferred.

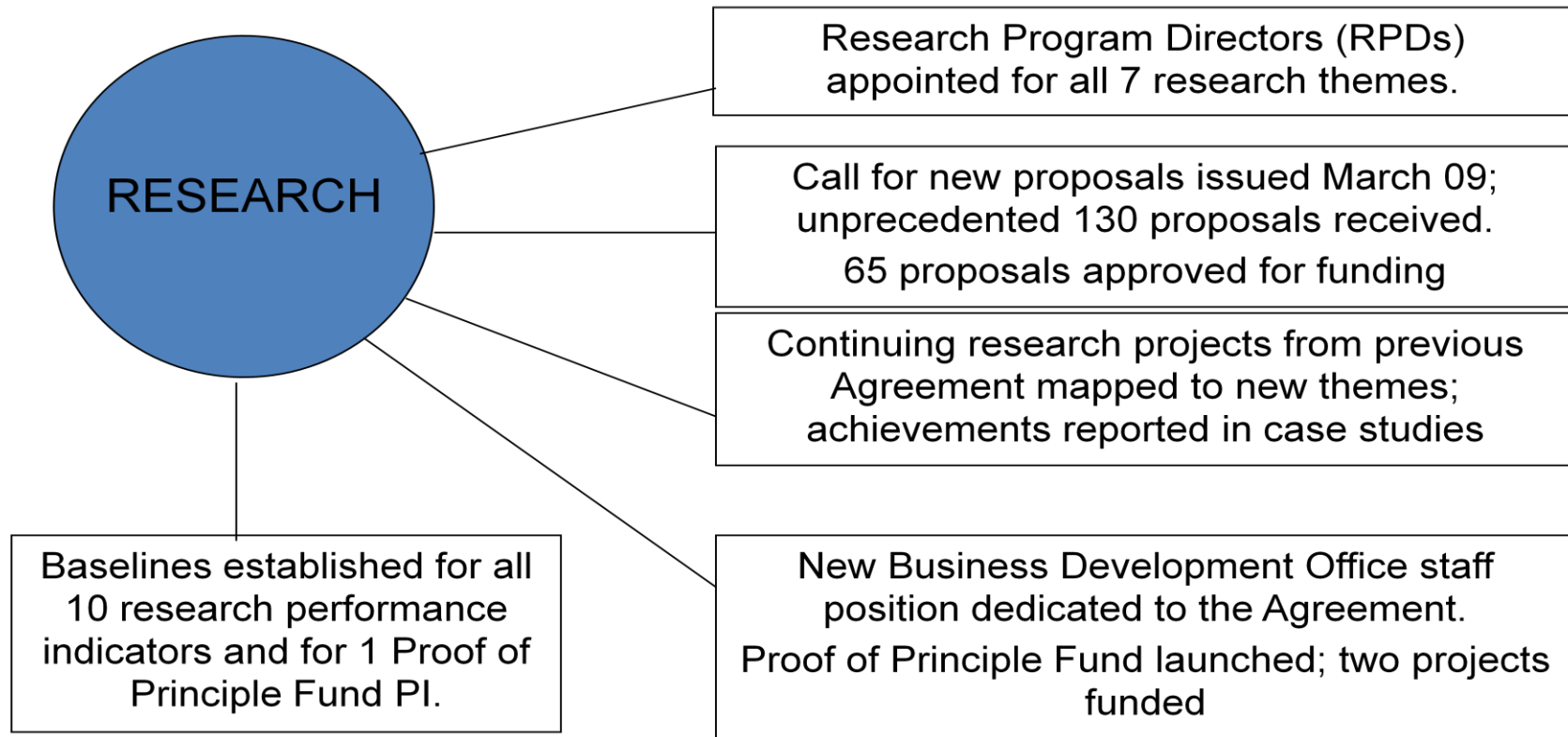
Key Outcome	Laboratory expertise and advice on animal health issues available to veterinary and stakeholder organizations	
Performance Indicator AHL9	Effectiveness of knowledge transfer and consultations provided to veterinary practices and other stakeholders	
	Metric:	Level of customer satisfaction with services provided by AHL program, by commodity
	Baseline:	AHL Client Satisfaction: 90% satisfaction rating
	Target:	2009-2013: ≥ 85 % satisfaction rating
	Results (2008/09):	<i>Question 13: Animal Health Lab uses AHL newsletters, Labnotes and Web-site as well as meeting updates and scientific publications for knowledge transfer to veterinarians.</i> <i>Question 18: Do you receive sufficient information on testing services that are available from the AHL?</i> 186 of 193 (96%) client responses reflect that knowledge transfer tools are effective. 48 of 58 (83%) clients responding to the survey feel they receive sufficient information on available testing services. Analysis of results from yearly AHL client satisfaction survey questions 13 and 18. Note: Question 13 of the survey had a very low response rate. To that end, OMAFRA would like to continue their annual review of the AHL client survey to ensure its usefulness, and encourage participation in the survey to substantiate the value of its findings, e.g., through an incentive such as a prize draw for a defined amount of free testing. Knowledge transfer from the AHL to clients and partners occurs via in-person discussions, newsletters, contributions of scientific articles, and peer-reviewed publications. The 17 veterinarians in the AHL are typically involved in numerous conversations with private practitioners daily, concerning individual case details, test selection, test interpretation, and technology updates. AHL staff members also attend practitioner meetings on a regular basis. For example, Dr. Jim Fairles (the AHL Client Services Veterinarian) provides frequent updates to the Ontario Association of Swine Veterinarians (OASV). More broadly, the AHL provides a wealth of information with emphasis on disease trend updates in the quarterly AHL Newsletter, which is distributed widely, is posted on the AHL website, and is well regarded. As well, AHL staff occasionally submit contributions to OMAFRA's newsletter, "Ceptor". The AHL is a regular participant at numerous conferences, e.g., the OVMA annual conference, both as an exhibitor, and as guest speakers or expert panel members. Dr. Fairles (supported by

		Ms. Josie Dobing-Given), actively markets the services of the AHL, and is in regular contact with AHL clients. As a matter of course, the AHL has added many new testing methodologies and tests such as polymerase chain reaction (PCR), gene sequencing, immunohistochemistry (IHC), which are presented in the AHL Newsletter. The AHL also produces a series of "LabNotes" for more in-depth analysis of current topics, e.g., understanding and selecting tests for BVDV. Finally, AHL staff contribute to a number of peer-reviewed scientific publications every year. A list of these publications is available upon request. From the analysis of survey questions related to knowledge transfer effectiveness, there are some areas for potential improvement which should be considered. While in general client responses show a good level of satisfaction in the area of AHL knowledge provision, there remains a significant gap in accessing and using this information by a large proportion of clients. Graphed results provided by the AHL point to the significant opportunity to improve access to scientific information and knowledge transfer. For example, it appears that fully 40% of clients did not respond to question 13 and may be unaware of the potential for using the AHL website to manage their information. Engaging the client base more completely through the web-site innovation and access will likely improve the AHL's competitive position and customer retention. A complete narrative is provided to further address this PI and is available upon request.
--	--	---

RESEARCH PROGRAM

Selected Performance Indicators & Accomplishments

Program Objective: High quality, high impact research results that strengthen Ontario's agriculture, food and bioproducts sectors, and rural communities



Research

Performance Indicators

Data collection and establishment of baselines for each Performance Indicator (PI) was completed by mid September, 2009, with the assistance of OMAFRA. The following table summarizes the Research Program's performance according to the 10 PIs in the Agreement. The majority of the data within this table was collected and summarized from annual and final project reports submitted each year by lead researchers of OMAFRA funded projects. Other information has been provided by OMAFRA, the UofG's Business Development Office and Budget Office.

Key Outcome	Research programs reflect OMAFRA strategic needs, coordinate U of G's capacity and mobilize the province's unique competitive strengths.	
Performance Indicator R1 a)	Comparison of actual versus planned OMAFRA/ U of G Research Program spending, in total, and in each of the research theme areas.	
	Metric (a-i)	Annual actual dollars in the OMAFRA/U of G partnership research program spent on research versus planned, in total by research theme.
	Baseline:	Baseline is the allocation of project planned \$ for 2008/09 by theme, as shown in the table below.
	Target:	2009-13: Ratio of actual to planned dollars spent of 1:1.
	Results (2008/09):	

Projects Active in 2008/2009

Theme	Ag & Rural Policy	Bioeconomy	Emerg Mgmt	Env Sust	Food	Prod Dev	Prod Syst I and II		Total
Project Commitments: Operating in year 08/09 (incl. prior year commitments)	277,500	677,000	8,000	580,056	349,000	658,100	1,494,700	A	4,044,356
Committed for Future years (09/10; 10/11)	219,000	145,000	0	690,826	200,000	245,700	1,699,050		3,199,576
Total Committed	496,500	822,000	8,000	1,270,882	549,000	903,800	3,193,750		7,243,932
Planned Dollars 08/09	800,000	1,000,000	500,000	1,000,000	1,000,000	900,000	2,400,000		7,600,000
Uncommitted Dollars (< > overcommitted)	303,500	178,000	492,000	<270,882>	451,000	<3,800>	<793,750>		356,068
Faculty Value	143,000	158,000	0	1,211,000	579,000	315,000	7,509,000		9,915,000
Research technician value	0	3,755	15,020	381,508	30,040	33,795	2,860,559		3,324,677
Projects Active in 2009/2010									
Theme	Ag & Rural Policy	Bioeconomy	Emerg Mgmt	Env Sust	Food	Prod Dev	Prod Syst I		Total
Project Commitments: Operating in 09/10 (incl. prior year commitments)	709,290	364,804	271,250	752,209	536,370	516,612	2,387,783		5,538,318
Committed for Future years (10/11; 11/12)	402,580	699,807	119,000	790,876	813,230	596,072	1,681,569		5,103,134
Total Committed	1,111,870	1,064,611	390,250	1,543,085	1,349,600	1,112,684	4,069,352	B	10,641,452
Total Committed to date (May 1/08 – April 30/13)	1,389,370	1,741,611	398,250	2,123,141	1,698,600	1,770,784	5,564,052	A+B	14,685,808
Planned Dollars 08/09 & 09/10	1,600,000	2,000,000	1,000,000	2,000,000	2,000,000	1,800,000	4,800,000		15,200,000
Current Uncommitted Dollars (< > overcommitted)	210,630	258,389	601,750	<123,141>	301,400	29,216	<764,052>		514,192
Note: Active project funding allocations for 2009/2010 have been included in this years' report as this was the first year of allocating the full funding amount of the Agreement.									

	Metric (a-ii)	Total number of projects funded in each theme area through peer review and advisory committee, compared to the number of letters of intent and proposals received (i.e., level of demand for funding) in each theme area.
	Baseline:	The table below shows the number of letters of intent (LOIs) and projects submitted, and projects funded for each of the seven research theme areas in the call of 2008/09.
	Target:	2009-13: An adequate number of quality research proposals submitted in each research theme area, from which to select projects to be funded in each call for proposals.
	Results (2008/09):	

2008/2009

Theme	Ag & Rural Policy	Bioeconomy	Emerg Mgmt	Env Sust	Food	Prod Dev	Prod Syst I	Prod Syst Tier II	Total
Number of funded projects (incl. continuing)	14*	5	2	15	9	5	13	43	92
Number of LOIs** (Last Call)	0	5	Note 1	20	10	Note 1	Note 2		35
Number of Proposals **	10	3		12	6				31
Number of proposal funded	4	1		10	6				21

* One project was funded by the RPD discretionary fund

** LOIs and proposals that were not funded were re-mapped as follows: RME to Environmental Sustainability, Food to Food for Health, Bioeconomy to Bioeconomy and SRC to Ag and Rural Policy. Note: for SRC only proposals were submitted ie the LOI process was skipped

Note 1: Emergency Management & Product Development Themes did not exist at the time of the "Last Call" for LOIs.

Note 2: No Calls for LOIs were issued under Production Systems in 2008/2009.

2009/2010

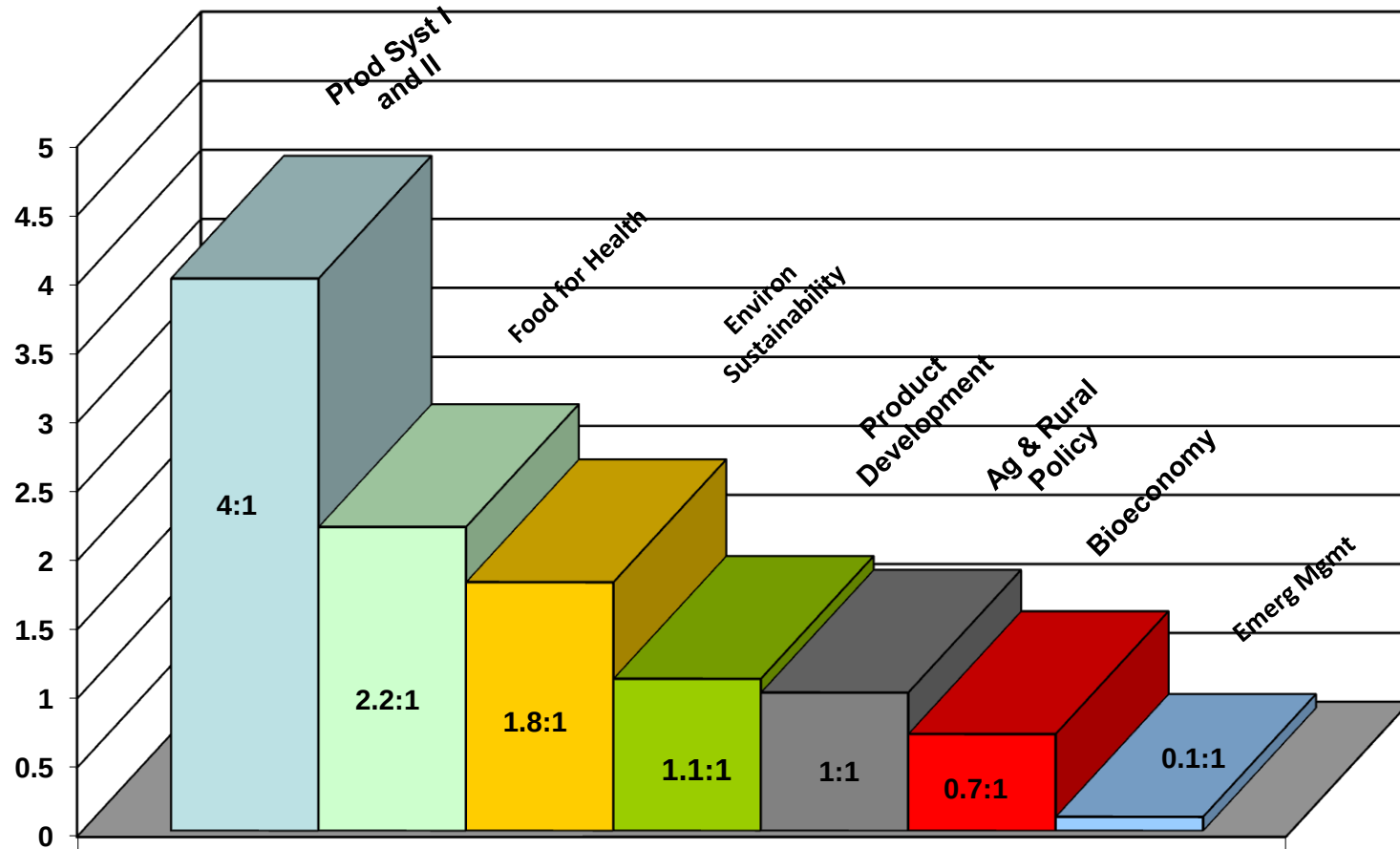
Theme	Ag & Rural Policy	Bioeconomy	Emerg Mgmt	Env Sust	Food	Prod Dev	Prod Syst I	Prod Syst II	Total
Number of funded projects	17	9	12	20	8	10	38	40	154
Number of LOIs***	0	0	0	0	0	0	0	0	0
Number of Proposals****	23	13	15	22	18	20	53	N/A	164
Number of proposals funded	12	5	11	8	6	6	26		74

*** The LOI process was skipped in this call and only proposals were reviewed

**** Some proposals were reviewed under more than one theme

Performance Indicator R1 b)	Total external research funding to the University related to OMAFRA's Research Program in aggregate.								
	Metric (b)	Ratio of third-party investment (cash and in-kind), leveraged by OMAFRA research program, in total and for each theme area.							
	Baseline:	2008/09: Baselines are shown in the table below.							
	Target:	2009-13: leveraged dollars to OMAFRA funding (in total, and by theme) to be $\geq$ 2008/09 baselines.							
	Results (2008/09):	Ratio of 2.3:1 third party investment to Agreement funding (ranging from 0.1:1 in Emergency Management to 4:1 in Production Systems). Total amount of third party investment - \$9.1m. Ratio is based on Actual Project Funding of \$4,044,356 from R1(a-i)							
Theme	Ag & Rural Policy	Bioeconomy	Emerg Mgmt	Env Sust	Food	Prod Dev	Prod Syst I and II		Total
Cash and in-kind	283,900	323,626	500	1,037,475	782,593	734,324	5,990,994		9,153,412
Ratio of Third Party-Investment to OMAFRA	1:1	0.7:1	0.1:1	1.8:1	2.2:1	1.1:1	4:1		2.3:1

Ratio of Third Party Investment to OMAFRA Operating Funds, by Research Program Theme



	Metric (c)	Total external research dollars attracted each year by the University related to the research program areas in total.
	Baseline:	The baseline for 2008/09 of leveraged dollars to OMAFRA funding is \$54.6 million: \$51.4 million, or approx. 1.1:1. This was determined by recalculating the actual leverage of "total external research dollars related to the OMAFRA research programs" in 2007/08 relative to the new \$7.6 million base of project operating funding.
	Target:	2009-13: Total external dollars leveraged is to be $\geq$ 2008/09 baseline of \$54.6 million.
	Results (2008/09):	2008/09 results: \$54.6 million.

Fiscal Year	Total UofG Research Funding (' 000) (Note 1)	Total OMAFRA Partnership Research Funding ('000) see Financial Table pg 41	Funding Leveraged from OMAFRA Agreement (Note 2)					Ratio
			Total Funding from All Sources (Est. ' 000)	Breakdown by Source (Note 3)				
				Federal	OMAFRA	Other Provincial	Business / Industry / Private / Other	
2008/2009	159,093	51,388	54,651	35,400	3,428	3,007	12,816	(54.6 : 51.4) 1.1:1

Note 1: "Total UofG Research Funding" is the total of all research projects (other than OMAFRA/UofG Agreement projects), regardless of whether or not they support OMAFRA's priorities.

Note 2: "Funding Leveraged from OMAFRA Agreement" (thousands of \$) is the total of all individual research project awards from all sources other than the Agreement for projects (across all UofG Departments/researchers) which support the objectives of OMAFRA's research priorities.

Note 3: "Breakdown by Source" shows the "Funding Leveraged from the OMAFRA Agreement" by the source of the funding "Federal" includes NSERC, SSHRC, CIHR, CFI, all federal departments, etc.; "OMAFRA" includes OMAFRA's 'competitive research programs' such as New Directions, including Food Safety, Alternative Fuels, Competitive Environment, etc.; "Other Provincial" includes funding from all other provincial ministries or agencies; and "Other" includes all other sources.

	Metric (d)	Number and list of active research projects funded, by program area.
	Baseline:	Number of active research projects established as per a-i and a-ii, above.
	Target:	2009-13: Targets for number of projects funded in each area to be $\geq$ 2008/09 levels.
	Results (2008/09):	Total number of Active Projects: 92 <u>Number of Active Projects by Theme</u> Agricultural and Rural Policy: 14* Bioeconomy – Industrial Uses: 5 Emergency Management: 2 Environmental Sustainability: 15 Food for Health: 9 Product Development: 5 Production Systems I: 13 Production Systems II: 43 <i>* One project was funded by the RPD discretionary fund</i> See Table R1 (d-ii) page 87 for a complete listing of projects
	Metric (e)	Level of utilization of research stations.
	Baseline:	New PI. Established based on 2008/09 data shown below. Utilization to be reported in three ways – i) # of projects using each station, ii) percentage of utilization and iii) \$ value of research station usage
	Target:	2009-13: Research station utilization to be $\geq$ 2008/09 levels.
	Results (2008/09):	Explanatory Note: Although ‘Percentage Utilization’ rates for most of the livestock stations (including Alma Aquaculture) may appear low, this is in large part attributable to the fact that most of these are based on a breeding herd/flock, and thus it is necessary to ‘carry’ an inventory of animals covering the full age span (neonates to fully mature production animals). As a consequence, a much smaller percentage of the total animal population are utilized in research projects, but those that are may be used relatively intensively/extensively. For the crops-based stations, the percent utilization values can vary from very high (where acreage dedicated to research is relatively small, and the balance of the station acreage is used for feed production for nearby

livestock stations, i.e., Arkell, Alfred, NLARS, Kemptville) to much lower by comparison (where 'excess acreage' has limited utility for alternative use, i.e., Vineland, Woodstock.) Most crops sites fall between these extremes, reflecting the relatively efficient use of crop acreage in research (allowing for generally a 3 or 4 year crop rotation, which results in 'utilization rates' of approximately 33% or 25% respectively.

Animal Research Station	Number of Projects	Percentage of utilization	\$ value of research station usage
Arkell Poultry	13	10.2	530,671
Arkell Swine	8	7.01	176,591
Arkell Equine	7	34.5	180,000
Elora/Ponsonby Dairy	8	8.6	134,103
Elora Beef	3	76.5	1,115,761
Ponsonby Sheep	4	36.4	140,746
Ponsonby General * Sheep	11	100	143,692
*Note this research station does not maintain a resident herd/flock so all animals are used for research			
Cattle		100	59,707
Swine		100	
Alma Aquaculture			
(in tank days) Tanks	4	19.5	34,499
Alfred Dairy	2	16.1	23,742
Kemptville Dairy	3	43.3	126,684
New Liskeard Beef **	Not available	Not available	Not available
** NLARS Beef is the source of calves for Elora Beef so nearly all animals are used for research at Elora			
Ridgetown Swine	2	Not available	Not available

Crop Research Station	Number of Projects	Percentage of utilization	\$ value of research station usage
Arnell Crops	2	100	2,566
Elora Crops	18	37.7	168,100
Alfred Crops	4	100	28,800
NLARS Crops	3	100	11,319
Emo Crops	1	100	81,000
Ridgetown Crops	13	29.4	103,407
Kemptville Crops	4	92.6	103,500
Simcoe	7	29.1	176,591
Vineland	6	14	117,641
Guelph Turfgrass	7	39.4	66,560
Bradford Muck Crops	2	26.3	56,008
Woodstock Crops	4	12.6	57,256
Total			\$3,638,944

Key Outcome	A critical mass of world class faculty, technical staff and graduate students addressing OMAFRA critical challenges and opportunities.	
Performance Indicator R2	Total faculty and research personnel employed by the University related to OMAFRA research themes, and the proportion funded through the OMAFRA/U of G Research Program.	
	Metric (a)	Total number of faculty FTEs and list of faculty and CARG researchers showing area of expertise, employed at the university related to theme areas.
	Baseline:	New PI. Established at 128 FTEs
	Target:	2009-13: Number of FTEs to be $\geq$ 2008/09 baseline.
	Results (2008/09):	

	Research / Researcher Awards supportive of OMAFRA priorities		
	No. of Researchers engaged in research supportive of OMAFRA priorities	"Faculty FTEs" focused on OMAFRA-related priorities	No. of OMAFRA-Supportive Research Awards (outside the OMAFRA/ UofG Partnership)
Total:	280	128	852

Explanation of Results: For each researcher, the value of their 'OMAFRA-supportive research awards received' was calculated as a portion of their 'total research awards received'. Combined across all UofG Colleges and based on an assumption that "on average across all departments, faculty allocate approx. 50% of their full FTE is allocated to research activity", it was calculated that the 280 faculty members engaged in research supportive of OMAFRA priorities actually contribute an estimated 128 FTEs towards this OMAFRA-supportive research,

A listing of faculty engaged in research supportive of OMAFRA priorities, along with their area of expertise and relation to the OMAFRA Themes has been compiled and provided to OMAFRA (and is available on request).

	Metric (b-i)	Number of faculty FTEs funded by OMAFRA partnership
	Baseline:	65 faculty FTEs as of 2008/09, compared to ~52 faculty FTEs as of 2007/08
	Target:	2009-13: to retain the number of faculty FTEs to the 2008/09 level as possible, but may erode due to inflation & other financial pressures.
	Results (2008/09):	Number of faculty FTEs specifically allocated to OMAFRA Partnership research projects: Total: 52.1 <u>By theme:</u> - Agricultural and Rural Policy: 2.1 - Bioeconomy – Industrial Uses: 1.2 - Emergency Management: 0.8 - Environmental Sustainability: 5.1 - Food for Health: 2.2 - Product Development: 2.5 - Production Systems I: 25.2 - Production Systems II: 13.0 Number of faculty FTEs engaged in projects supportive of OMAFRA priorities (but not allocated to approved OMAFRA Partnership projects) is estimated at 128 FTEs (see Metric R2a).
	Metric (b-ii)	Total number of research personnel FTEs (i.e. post-doctoral students, graduate students, research associates), that are funded through the OMAFRA / UG Partnership, in total and by research theme area.
	Baseline:	New PI. 113 research personnel (post-doctoral students, graduate students, research associates) funded through OMAFRA approved projects.
	Target:	2009-13: to retain the number of research personnel FTEs to the 2008/09 level as possible, but may erode due to inflation & other financial pressures.

	Results (2008/09):	Total number of research personnel FTEs: 112.84 <u>Research Personnel FTEs by theme</u> Agricultural and Rural Policy: 4.00 Bioeconomy – Industrial Uses: 0.09 Emergency Management: 1.90 Environmental Sustainability: 11.80 Food for Health: 5.14 Product Development: 0.29 Production Systems I: 57.18 Production Systems II: 32.44
	Metric(b-iii)	Number of faculty, CARG researchers and research personnel FTEs that are funded through the OMAFRA/UofG Partnership in total and by research theme area.
	Baseline:	Established at 172 faculty and CARG researchers funded through the partnership in total.
	Target:	2009-13: to retain the number of FTEs to the 2008/09 level as possible, but may erode due to inflation & other financial pressures, but may decline due to inflation.
	Results (2008/09):	Total number of Faculty, CARG & Research Personnel FTEs: 171.97 <u>Total FTEs by theme</u> Agricultural and Rural Policy: 6.24 Bioeconomy – Industrial Uses: 2.10 Emergency Management: 2.65 Environmental Sustainability: 19.59 Food for Health: 7.34 Product Development: 2.79 Production Systems I: 84.74 Production Systems II: 46.52

Key Outcome	A critical mass of world class faculty, technical staff and graduate students addressing OMAFRA critical challenges and opportunities	
Performance Indicator R3	Level of recognition of faculty and students by their peers.	
	Metric (a)	Examples of faculty/researchers/staff related to the research theme areas, recognized by their peers for example through research chairs, awards of recognition, appointment to prestigious positions (international panels) and leadership of national and international research initiatives
	Baseline:	New PI. 2008/09 results to be the baseline. Same as OA1metric c)
	Target:	2009-13: Recognition as indicated by awards, appointments etc. to be $\geq$ 2008/09.
	Results (2008/09):	During 2008/09, 25 faculty members at the UofG were Canada Research Chair holders, of which 10 had active OMAFRA Research projects.
	Metric (b)	U of G's position compared to other Canadian universities, and their ranking in the previous year in the comprehensive category as published annually by Research Money Inc.
	Baseline:	Research Money Inc.'s most current (2008) rankings put UofG in second place among Canadian 'comprehensive' universities.
	Target:	2009-13: U of G's ranking to be second or better among comprehensive universities in Canada.
	Results (2008/09):	Research Money Inc.'s most current (2008) rankings put UofG in second place among Canadian 'comprehensive' universities.
	Metric (c)	Number of faculty who publish in high impact journals.
	Baseline:	New PI. 91 faculty published in high impact journals in 2008/09. 'High impact' journals were identified by OMAFRA/UofG research program directors.
	Target:	2009-13: Number of faculty publishing in high impact journals to be $\geq$ 2008/09 baseline.

	Results (2008/09):	Total number of faculty published in high impact journals: 91 <u>Faculty by theme</u> Agricultural and Rural Policy: 3 Bioeconomy – Industrial Uses: 3 Emergency Management: 0 Environmental Sustainability: 5 Food for Health: 7 Product Development: 6 Production Systems I & II: 67
Key Outcome	High quality research focused on OMAFRA priorities	
Performance Indicator R4	Scientific merit and relevance of research projects in each research theme area supported through the Agreement.	
	Metric (a)	Report how composition of advisory committee is representative of stakeholders in each theme
	Baseline:	2008/09 baseline for stakeholder representation in Theme Research Proposal Review shown in table below.
	Target:	2009-13: adequate representation of stakeholders on advisory committees, as achieved in 2008/09.
	Results (2008/09):	Note; Research Themes were not yet established for the Call for projects to begin May 1, 2008; therefore, the table below shows representation of stakeholders on advisory committees per theme for projects beginning May 1/ 2009; the first full year of funding, by Theme, for the new Agreement.

Theme	Ag & Rural Policy	Bioeconomy	Emerg Mgmt	Env Sust	Food	Prod Dev	Prod Syst - Livestock	Prod Syst - Plants
University Institutions	3	2	3	3	3	2	3	3
OMAFRA	4	2	3	3	4	3	3	2
Other Gov't Sectors	1	2	1	2	0	0	1	1
Non-Gov't Sectors	1	2	0	0	0	1	0	0
Industry	2	1	2	1	1	3	2	2

	Metric (b)	Total number of publications in peer reviewed journals and % of those appearing in high impact journals (as tracked. Same as R3, metric c).
	Baseline:	New PI. 2008/09 baseline of 265 publications, 57% of which were in 'high impact' journals.
	Target:	2009-13: Number of publications and % in high impact journals to be ≥ 2008/09 baselines.
	Results (2008/09):	Total number published in peer reviewed journals: 265. Total percentage in high impact journals: 57% <u>Peer Reviewed Journals by Theme & Ratio in High Impact</u> Agricultural and Rural Policy: 8 – 50% Bioeconomy – Industrial Uses: 8 – 75% Emergency Management: 0 – 0% Environmental Sustainability: 6 – 67% Food for Health: 17 – 35% Product Development: 10 – 40% Production Systems I & II: 216 – 58%
	Metric (c)	Number of collaborations and/or partnerships with external institutions.
	Baseline:	New PI. Number of collaborators in 2008/09 will be the baseline
	Target:	2009-13: Number and significance of collaborations and/or partnerships targeted to be ≥ 2008/09 baseline.
	Results (2008/09):	i) Total number of collaborators for projects active in 2008/09 and previous fiscal years: 230 ii) Total number of collaborators for active projects approved in 2008/09: 47 <u>Collaborators by theme: i) and ii)</u> Agricultural and Rural Policy: 15 7 Bioeconomy – Industrial Uses: 7 3 Emergency Management: 0 0 Environmental Sustainability: 24 31* (includes 12 OMAFRA staff) Food for Health: 8 5 Product Development: 13 4 Production Systems I & II: 163 0

Key Outcome	High quality research focused on OMAFRA priorities	
Performance Indicator R5	Benefits to the economy, the environment and the health and well-being of the province, generated from the Research Program.	
	Metric	One case study completed annually of initiatives undertaken related to each research theme that impacted Ontario This outcome would also be assessed by the Expert Review of each research theme area scheduled at the end of five years.
	Baseline:	New PI. One case study provided from the 2008/09 research of each research theme.
	Target:	2009-13: a case study to be provided annually from each research theme, for use by the Expert Review at year five.
	Results (2008/09):	One case study is provided for each theme (two for Production Systems – livestock and crops) and included in the Program Highlight Section.
Key Outcome	Highly skilled U of G graduates meet changing workforce demands	
Performance Indicator R6	Level of engagement of University graduate students in OMAFRA/U of G research projects.	
	Metric (a)	Total number of graduate students working on research projects related to each theme areas, under the Partnership.
	Baseline:	New PI. 140 grad students in 2008/09.
	Target:	2009-13: Number of grad students to be maintained at 2008/09 level, but may decline due to inflation.
	Results (2008/09):	Total number of Graduate Students: 140 <u>Graduate Students by theme</u> Agricultural and Rural Policy: 4 Bioeconomy – Industrial Uses: 5 Emergency Management: 3

		Environmental Sustainability: 8 Food for Health: 4 Product Development: 4 Production Systems I & II: 112
	Metric (b)	Total number of graduate students enrolled in the HQP program funded under the Partnership.
	Baseline:	HQP program scheduled to be implemented in summer 2009.
	Target:	New PI. Target to be based on 2009-2010 student enrolment.
	Results (2008/09):	Not available for 2008/09; first intake of students in summer 2009.
	Metric (c)	Percentage of HQP graduates that are employed in sectors or fields related to the theme areas.
	Baseline:	Results for this PI will not be available until after first HQP program students graduate (likely 2012 for MSc 'HQP' graduate students).
	Target:	New PI. 2012-2013 will be baseline year.
	Results (2008/09):	Not available for 2008/09; first HQP grads in 2012.

Key Outcome	Industry and other stakeholders adopt state of the art practices and systems	
Performance Indicator R7	Transfer of new knowledge and utilization by industry and other stakeholders, related to OMAFRA research theme areas.	
	Metric (a)	Total number of knowledge transfer events related to new practices and technologies in each theme area.
	Baseline:	Established (for overall total for Research Program) See table below for 2008/09 baseline.
	Target:	2009-13: Number of knowledge transfer events $\geq$ 2008/09 baseline.
	Results (2008/09):	

	Ag & Rural Policy	Bioeconomy	Emerg Mgmt	Env Sust	Food	Prod Dev	Prod Syst I & II	Total
Peer-reviewed journal publications	8	8	0	6	17	10	216	265
Presentations at scientific conferences,	5	3	2	13	6	8	78	115
Articles published in the public press	34	42	0	6	3	2	205	291
New presentations posted on the internet	4	1	0	0	1	0	5	11
Presentations to stakeholder or industry	41	25	5	41	16	14	236	378

	Metric (b)	Examples of utilization of new knowledge by stakeholders.
	Baseline:	Anecdotal reports of utilization of new knowledge by stakeholders
	Target:	2009-13: Annual reports of utilization of new knowledge by stakeholders
	Results (2008/09):	Examples of 2008/09 research yielding new knowledge being used by stakeholders: • Prof. Emes' Project: Evaluation of new modified starches by Lorama Chemicals Inc. • Prof. Erickson's Project: Extensive interaction with OMTEC Inc, Mississauga, in developing the technology for converting soy and wheat straw into a form amenable to formulation with plastics
	Metric (c)	Total number of licenses and patents and those applied for (See R8).
	Baseline:	See R8, metric b) and c)
	Target:	See R8, metric b) and c)
	Results (2008/09):	See R8, metric b) and c)
	Metric (d)	Ratio of third-party investment leveraged by OMAFRA research funding, by each theme area. (See R1, metric b).
	Baseline:	See R1, metric b)
	Target:	See R1, metric b)
	Results (2008/09):	See R1, metric b)

Key Outcome	Research results commercialized	
Performance Indicator R8	Patents, licenses to existing or start-up companies, existing businesses spun out and community-based service businesses created, and the economic impact. R8 is also a PI for the Joint Intellectual Properties.	
	Metric (a)	Number of disclosures and technology assessments, by theme
	Baseline:	364 total disclosures and technology assessments in 2008/09
	Target:	2009-13: number of disclosures and technology assessments $\geq$ 2008/09 baseline.
	Results (2008/09):	Total number of OMAFRA related disclosures: 364 <u>Disclosures by theme</u> Agricultural and Rural Policy: 0 Bioeconomy – Industrial Uses: 0 Emergency Management: 0 Environmental Sustainability: 0 Food for Health: 0 Product Development: 2 Production Systems (Animal): 3 Production Systems (Crops): 359
	Metric (b)	Number of patent applications filed, by theme
	Baseline:	9 patents filed in 2008/09
	Target:	2009-13: Number of patent applications to be $\geq$ 2008/09 baseline.
	Results (2008/09):	Total number of OMAFRA related patents filed: 9 <u>Patents filed by theme</u> Agricultural and Rural Policy: 0 Bioeconomy – Industrial Uses: 0 Emergency Management: 0 Environmental Sustainability: 0

		Food for Health: 0 Product Development: 2 Production Systems (Animal): 7 Production Systems (Crops): 0
	Metric (c)	Number of licenses granted by theme
	Baseline:	17 licences granted in 2008/09
	Target:	2009-13: Number of licences granted to be $\geq$ 2008/09 baseline.
	Results (2008/09):	Total number of OMAFRA related licenses granted: 17 <u>License & amending agreements by theme</u> Agricultural and Rural Policy: 0 Bioeconomy – Industrial Uses: 0 Emergency Management: 0 Environmental Sustainability: 0 Food for Health: 0 Product Development: 1 Production Systems (Animal): 0 Production Systems (Crops): 16
	Metric (d)	Patents issued
	Baseline:	5 patents as per 2008/09
	Target:	2009/13: Number of patents issued to be $\geq$ 2008/09 baseline.
	Results (2008/09):	Total number of OMAFRA related patents issued: 5 <u>Patents filed by theme</u> Agricultural and Rural Policy: 0 Bioeconomy – Industrial Uses: 1 Emergency Management: 0 Environmental Sustainability: 0 Food for Health: 0 Product Development: 0 Production Systems (Animal): 0 Production Systems (Crops): 4

	Metric (e)	Total dollar value of revenue generated from licenses associated with OMAFRA-supported research
	Baseline:	\$1.3 million revenue generated as per 2008/09.
	Target:	2009-13: Total dollar value to be $\geq$ 2008/09 baseline.
	Results (2008/09):	Total dollar value of revenue generated from licenses associated with OMAFRA-supported research: \$1,340,583.17 Revenue from OMAFRA-supported non-seed research from fiscal year end April 30, 2009: \$778,731.50 Revenue from OMAFRA-supported seed research fiscal year-end March 31, 2009: \$561,851.67
	Metric (f)	Three brief case studies of individual files from different themes and initiatives taken to advance commercialization
	Baseline:	Three case studies as per 2008/09.
	Target:	2009-13: Three case studies to be presented annually.
	Results (2008/09):	Three case studies are provided in the Program Highlights Section.
Key Outcome	Awareness of research outcomes and impacts among decision makers, staff and stakeholders	
Performance Indicator R9	Stakeholder assessment of OMAFRA/ University research outcomes on industry, the economy and the health and well-being of Ontario citizens.	
	Metric	This outcome would also be assessed by the Expert Review of each theme area schedule at the end of five years.
	Baseline:	This PI will be achieved through an assessment similar to the Deloitte Study – 2007 (UofG / OMAFRA Impact Study), to be conducted in 2012/13 and planned in 2009/10. In the interim, the Deloitte Study serves as the baseline.
	Target:	2013: Expert Review of awareness of research outcomes and impacts among decision makers.
	Results (2008/09):	2008/09 results for all performance indicators and those of remaining years will provide the information for the stakeholder assessment in year five.

Key Outcome	Awareness of research outcomes and impacts among decision makers, staff and stakeholders	
Performance Indicator R10	Media citations related to research in OMAFRA research theme areas.	
	Metric (a)	Total number of media citations
	Baseline:	New PI. A total of 190 media citations were identified by researchers in their 2009 U of G annual and final reports. Additionally, 135 media articles were picked up by clipping services. This 2008/09 baseline is likely a significant underestimate of media pick-up but is represents the best available measure.
	Target:	2009-13: Number of media citations to be ≥ 2008/09 baseline.
	Results (2008/09):	From researchers' 2009 annual and final research reports, number of media citations: Ag and rural policy: 34 Bioeconomy: 56 Product Development and Enhancement: 2 Emergency Management: 0 Production Systems: 87 Environmental Sustainability: 5 Food for Health: 6 From clipping services: 135

Research Performance Indicators

Table for R1, (Metric d-ii) - Listing of Active Research Projects

OMAFRA/UofG Research Program Projects - 2008/2009

Environmental Sustainability Theme					Project Leader
Project #	Start Date	Approved End Date	Approved Program	Title	
026589	1-Apr-08	30-Apr-09	Env Sust	Preliminary Assembly of Measurements and Estimates of Soil Hydraulic Property Data for Soil Water Budgeting Modeling	Parkin, G. Crolla, A.
026577	1-May-08	31-Mar-10	Env Sust	Environmental Sustainability of On-farm Manure Anaerobic Digestion	
026585	01-May-08	30-Apr-10	Env Sust	Impact of manuring and fertilization history on phosphorous sorption/desorption in agricultural soils of Ontario: Implications for the Ontario P index.	O'Halloran, I. Deen, B.
026598	1-May-08	30-Apr-11	Env Sust	Carbon, nutrient and economic impacts of Miscanthus production under Ontario conditions	
026599	1-May-08	31-Dec-10	Env Sust	Use of reclaimed wastewater on soil chemical and microbial properties and growth of turfgrass for sod production and maintained turfgrass systems.	Jordan, K. Warland, J.
026579	1-May-08	31-Mar-11	Env Sust	Environmental impact of crop residue removal under conventional and zero-tillage scenarios.	
026580	1-May-08	30-Apr-11	Env Sust	Filling in the knowledge gaps of N dynamics in horticultural-cover crop systems: Utilizing lysimeters to characterize potential N losses over the winter and in the subsequent growing season.	Van Eerd, L.
026592	1-May-08	30-Apr-10	Env Sust	Developing Environmental, Production and Marketing Best Management Practices for Ontario Agriculture	
026137	01-May-04	30-Apr-09	Env Sust	Climate Change- Mitigation and Adaptation in Ontario Agriculture	Bredahl, M. Weersink, A.
026533	01-Apr-07	31-Mar-11	Env Sust	Manure and Organic Waste Treatment Technologies	
026545	01-May-07	30-Apr-11	Env Sust	Evaluating the Cost Effectiveness of Multiple Best Management Practices in Agricultural Watersheds.	Yang, W.
026597	1-May-08	30-Apr-11	Env Sust	Integrated assessment of atmospheric emissions of ammonia, greenhouse gases and size fractionated particulate matter across farming systems.	
026603	1-May-08	30-Apr-12	Env Sust	Impact of Climate Change on efficiency of management practices for improved water quality in agro-ecosystem	Rudra, R.
026642	1-May-07	30-Sep-09	Env Sust	Comparison of Nitrous Oxide Emissions Between an Intercropping System and a Conventional Monoculture System	
026142	01-May-04	30-Jun-08	Env Sust	Environmental Characterization of Selected Dead Animal Disposal Methods	Gordon, A. Van Heyst, B

Food for Health Theme

Project #	Start Date	Approved End Date	Approved Program	Title	Project Leader
026573	01-May-08	01-May-10	Food for Health	Fibre-fortified dairy products: Effects on nutritional and functional properties	Goff, H.D.
026575	01-May-08	30-Apr-09	Food for Health	Exploration of Soy Isoflavone-Enriched Bread in Relation to Improved Formulation and Sensory Attributes, Cardiovascular Disease Risk and Economic Market Feasibility	Duncan, A.
026581	01-May-08	30-Apr-09	Food for Health	Enhancement of breads to optimize carbohydrate management in adults with type 2 diabetes	Graham, T.
026578	01-May-08	30-Apr-11	Food for Health	The potential impact of low temperature sweetening in potatoes on process quality, nutrition and food safety	Yada, R.Y.
026215	01-Jun-04	30-Apr-09	Food for Health	Development of In Vivo Assessment Technologies for Detection of Potential Allergenicity and Toxicity of Novel Foods	Karrow
026212	01-Jun-04	01-Jun-08	Food for Health	Functionality of Resistant Starch & Bioactive Peptides in Preventing Chronic Diseases and Promoting Gut Functions in Studies with the Pig Model	Fan, M.
026220	01-May-04	31-Jul-08	Food for Health	Understanding and Managing consumer concerns relating to new food technologies	Henson, S.
026211	01-Sep-04	31-Aug-08	Food for Health	Bioavailability and Economics Benefits of Value-Added Isoflavone-Rich Soybeans Incorporated into a Functional Food	Duncan, A.
026216	01-Sep-04	31-Aug-08	Food for Health	Impacts of Breads on biomarkers for type 2 Diabetes & Cardiovascular Disease	Graham, T.

Bioeconomy - Industrial Uses Theme

Project #	Start Date	Approved End Date	Approved Program	Title	Project Leader
026607	1-May-08	30-Apr-10	Bioeconomy	Engineered Biocomposites from Natural Fibers and Biodegradable Polymers for Transportation Industries	Mohanty, A.
026259	1-Sep-05	31-Jan-10	Bioeconomy	Novel materials from Ontario crop plants - linking Agriculture and manufacturing to create value and enhance sustainability.	Erickson, L.
026384	1-Sep-06	31-Aug-10	Bioeconomy	Evaluating protein sources from natural and transgenic plant sources for manufacturing industrial fibres and films.	Pauls, P.
026631	25-Jun-08	25-Jun-09	Bioeconomy	Premier's Research Chair in Biomaterials & Transportation Equipment	Mohanty, A.
026547	1-Jul-07	30-Apr-11	Bioeconomy	Economic Effects of Bioproduct Efforts on Ontario Agriculture.	Weersink, A.

Production Systems Theme - Tier I Projects

Project #	Start Date	Approved End Date	Approved Program	Title	Project Leader
026480	1-May-07	30-Apr-11	Prod Systems Tier I	From Vineyard to Vintage: the Ontario Grape Research Program	Fisher, H.
026481	1-May-07	30-Apr-11	Prod Systems Tier I	Innovative Research to Contribute to the Prosperity and Sustainability of the Tree Fruit Industry.	Cline, J.
026484	1-May-07	30-Apr-10	Prod Systems Tier I	Healthy Food: Healthy Ontario. Vegetables, Human Nutrition, and the Environment.	McDonald, M.
026352	1-May-06	30-Apr-10	Prod Systems Tier I	Pest Management systems for sustainable field crop productions: responding to new challenges.	Swanton, C.
026354	1-May-06	30-Apr-10	Prod Systems Tier I	Reproductive technologies - from test tubes to animals.	King, A.
026358	1-May-06	30-Apr-10	Prod Systems Tier I	Sustainable pork production: from gene expression to nutrient utilization efficiency and pork meat quality.	deLange, K.
026360	1-May-06	30-Apr-10	Prod Systems Tier I	Genomic profiling for beef quality, efficiency and value.	Miller, S.
026361	1-May-06	30-Apr-10	Prod Systems Tier I	Sustainable pork production: Healthy pigs and safe pork.	Friendship, R.
026371	1-May-06	30-Apr-10	Prod Systems Tier I	Enhancing poultry health and welfare.	Nagy E.
026373	1-May-06	30-Apr-10	Prod Systems Tier I	Energy efficient cycling of C and N for year-round production of high-value fresh produce and bioproducts in Controlled-Environment-Systems.	Grodzinski, B.
026178	1-May-03	30-Apr-09	Prod Systems Tier I	Enhancing the food safety of honey bee hive products through the use of organic beekeeping practices and effective monitoring of pests	Guzman, E.
026335	1-May-05	31-Mar-10	Prod Systems Tier I	Northwestern Grant	Rowsell, J.
026647	1-May-08	30-Apr-10	Prod Systems Tier I	Monitoring leaf functions to detect diseases in controlled-environment-systems (CES).	Goodwin, P.

Sustainable Production Systems Research Program - Tier II Projects

Project #	Start Date	Approved End Date	Approved Program	Title	Project Leader
026619	1-Mar-08	30-Sep-08	Prod Systems Tier II	DeLaval Footbath Efficacy Evaluation - Elora Dairy Research Centre	Leslie, K.
026488	1-May-06	5-Sep-08	Prod Systems Tier II	Testing two mycotoxin detoxifiers for ability to make highly infected corn useable for swine.	Luimes, P.
026620	15-Apr-08	28-Feb-09	Prod Systems Tier II	Evaluation of a DBC supplement for dairy calves	Leslie, K.
026535	27-Mar-07	31-Mar-09	Prod Systems Tier II	Use of dietary thyroxin as an alternative moulting procedure in turkey breeder hens.	Bedecarrats, G.
026640	25-Aug-08	30-Apr-09	Prod Systems Tier II	A comparison of the extent of frost tolerance in facultative winter annual weeds	Van Acker, R.
026623	1-May-08	30-Apr-09	Prod Systems Tier II	Synchronizing sows to farrow later.	Luimes, P.
026624	1-May-08	30-Apr-09	Prod Systems Tier II	Mycotoxin Detoxification using Sodium Busulfite	Luimes, P.
026625	1-May-08	30-Apr-09	Prod Systems Tier II	Effect of Uterine Ecobolic Therapy on Rate of Uterine Involution, Incidence of Postpartum Uterine Disease and Reproductive Performance in Dairy Cows	Chenier, T.
026503	1-Dec-06	30-Apr-09	Prod Systems Tier II	Support for Sheep for the Research Component of a Gartshore Award	Grovum, L.
026626	1-Jun-08	30-Jun-09	Prod Systems Tier II	Genetic regulation of immune responsiveness and disease resistance of dairy cattle	Mallard, B.
026536	1-Sep-07	1-Sep-09	Prod Systems Tier II	Effects of feed borne mycotoxins on the performance, carcass quality and health of grain fed veal calves.	Swanson, K.
026634	10-Jul-08	31-Oct-09	Prod Systems Tier II	Effect of feed borne <i>Fusarium</i> mycotoxins on performance and metabolism of poultry.	Smith, T.
026635	1-Jan-08	31-Dec-09	Prod Systems Tier II	Proliferative potential, tri-lineage potency and allogenic immunogenic evaluation of equine cord blood stem cells.	Betts, D.
026636	1-May-08	30-Jun-09	Prod Systems Tier II	Do subchondral bone (SCB) and cartilage follow a common pathway in early stage post-traumatic osteoarthritis?	Hurtig, M.
026617	1-May-08	31-Dec-09	Prod Systems Tier II	Strategic Use of a Nutritional Amino Acid Imbalance to reduce NSF:fat ratio of milk	Cant, J.
026552	1-Apr-07	31-Mar-10	Prod Systems Tier II	The impact of omega-3 and -6 fatty acids on inflammation during ruminant pregnancy, lactation, and fetal development. SR1106-35	Karrow, N.
026444	1-May-06	30-Apr-10	Prod Systems Tier II	Forages for alternative management systems.	Bowley, S.

026363	1-May-06	30-Apr-10	Prod Systems Tier II	Turning commodity into market opportunity: new products and solutions for sustainable production of soybean, dry bean and canola in Ontario	Rajcan, I.
026359	1-May-06	30-Apr-10	Prod Systems Tier II	Cereal evaluation and breeding for an enhanced and sustainable future.	Falk, D.
026356	1-May-06	30-Apr-10	Prod Systems Tier II	Development of new strategies to improve rural and urban landscapes through sustainable turfgrass management.	Lyons, E.
026351	1-May-06	30-Apr-10	Prod Systems Tier II	Expansion of Canadian asparagus sales in North America while combating emerging threats from foreign competition.	Wolyn, D.
026343	1-May-06	30-Apr-10	Prod Systems Tier II	Reducing fossil fuel inputs in corn production through breeding and agronomy.	Lee, E.
026340	1-May-06	30-Apr-10	Prod Systems Tier II	Sustainable management systems for berry crops; season extension and cultivar development for the benefit of Ontarians.	Dale, A.
026618	1-May-08	30-Apr-10	Prod Systems Tier II	Effect of feeding management on learning of diet selection in dairy heifers.	DeVries, T.
026630	1-May-07	30-May-10	Prod Systems Tier II	Recombinant Bovine C3d as an Adjuvant to Facilitate Early CalfhooD Vaccination	Shewen, P.
026637	1-May-08	30-Apr-10	Prod Systems Tier II	Mechanisms of maintenance and loss of early pregnancy	Betteridge, K.
026638	1-May-08	30-Apr-10	Prod Systems Tier II	Functions of Equine Clara Cell Secretory Protein	Bienzle, D.
026639	1-Feb-07	31-May-10	Prod Systems Tier II	Investigating Radiation Bystander Effects in Fish: Implications to Resource Management, Environment and Farm Animal Health	Moccia, R.
026551	1-May-07	30-Apr-11	Prod Systems Tier II	A strategy to improve wheat yield and quality through integrated management of fusarium head blight.	Schaafsma, A.
026548	1-Jul-07	30-Apr-11	Prod Systems Tier II	Mitigating ammonia release from caged layer facilities.	Leeson, S.
026553	1-Nov-07	30-Apr-11	Prod Systems Tier II	Nutrient content and feeding value of corn distillers grains produced by ethanol plants in Ontario.	Leeson, S.
026621	1-May-08	30-Apr-13	Prod Systems Tier II	Genetics of disease resistance in ruminants: Interaction between the HP-adrenal axis and the immune system.	Karrow, N.
026627	10-Jun-08	10-Jun-12	Prod Systems Tier II	The effects of glutamine supplementation during metabolic acidosis on gastrointestinal tract (GIT) protein synthesis, protein degradation and GIT growth.	McBride, B.
026544	1-May-07	31-Dec-09	Prod Systems Tier II	Clinical signs and mechanisms of airway inflammation of equine rhinitis A virus in experimentally infected horses	Viel, L.
026543	1-May-07	31-Dec-09	Prod Systems Tier II	Vaccination against Rhodococcus equi pneumonia of foals.	Prescott, J.
026613	01-May-07	30-Dec-09	Prod Systems Tier II	Study on the pathogenesis of arterial calcification in horses and its potential clinical implications.	Viel, L.

026643	1-Jan-09	15-Sep-10	Prod Systems Tier II	An Investigation of Meloxicam for the Relief of Pain Associated with Parturition in Lactating Dairy Cows	Duffield, T.
026644	1-Nov-08	31-Oct-11	Prod Systems Tier II	The application of genomic approaches to rainbow trout aquaculture	Danzmann, R.
026646	1-May-09	31-Dec-11	Prod Systems Tier II	Evaluation of Two Sedation/Analgesia Protocols to Assist Ventilatory Support in the Critically Ill Equine Neonate	Kerr, C.
026650	13-Feb-09	31-Dec-11	Prod Systems Tier II	Elixir Milk: Evaluation of Mechanisms of Phytochemical Transfer to Milk	Osborne, V.
026443	1-May-06	30-Apr-09	Prod Systems Tier II	Osteoarthritis and Quality of Life	Hurtig, M.
026645	1-Nov-08	31-Oct-11	Prod Systems Tier II	Hazelnuts, a potential industry for Ontario	Dale, A.
026652	20-Apr-09	30-Nov-09	Prod Systems Tier II	Evaluation of Pain and Discomfort Associated with Routine Drying-off in Dairy Cows	Leslie, K.

Agricultural and Rural Policy Theme

Project #	Start Date	Approved End Date	Approved Program	Title	Project Leader
026628	01-Apr-08	31-Mar-09	Ag & Rural Policy	Labour Market Experiences of Recent Dependent Female Skilled Immigrants in Smaller Communities and Rural Areas.	Bauder, H.
026610	01-May-08	30-May-09	Ag & Rural Policy	Rural Development and Horse Farms: Understanding the Economic and Social Impacts of Horse Farms in the Urban-Rural Fringe Regions of Ontario	Caldwell, W.
026609	01-May-08	31-Aug-09	Ag & Rural Policy	Models and best practices for building effective local food systems	Landman, K.
026612	01-May-08	30-Apr-09	Ag & Rural Policy	Assessment of the Current and Future Farm Economy of the Ontario Greenbelt	Cummings, H.
026525	1-Apr-07	29-Aug-09	Ag & Rural Policy	Policy alternatives for severely reducing or eradicating poverty in rural Canada	Reid, D.
026648	1-Dec-08	30-Apr-09	Ag & Rural Policy	10 Year Summary of Sustainable Rural Communities	Wilton, B.
026594	1-Sep-08	30-Apr-11	Ag & Rural Policy	Economic and Community Capacity Analysis of the Alternative Land Use Services (ALUS) - Norfolk County Pilot Project	Fox, G.
026528	01-May-07	30-Apr-11	Ag & Rural Policy	Evaluating the Effects of National and International Agrifood Policies on Canada	Meilke, K.
026532	01-May-07	30-Apr-10	Ag & Rural Policy	Measuring the competitiveness of the Ontario pork sector to other Canadian provinces and U.S. states	McEwan, K.
026522	1-May-07	30-Jun-08	Ag & Rural Policy	The Economic Impact of 'Transportation Disadvantage' on Women in Northern Ontario.	Leach, B.

026523	1-May-07	15-Jun-08	Ag & Rural Policy	Rural-Urban Linkages for Local Food in the City of Guelph-County of Wellington Landscape	Landman, K.
026328	01-May-05	04-Jul-08	Ag & Rural Policy	Diverse Workplaces, Homogeneous Towns? Exploring the linkages between rural labour markets and immigration in Ontario.	Preibisch, K.
026518	1-May-07	1-Sep-08	Ag & Rural Policy	Municipal Readiness for Environmental Planning: Innovation and Best Practices Towards Sustainability for Rural Communities	Caldwell, W.
026608	01-May-08	30-Dec-08	Ag & Rural Policy	Measuring Urban Pressure on Rural Communities: A Key Variable to Understanding and Anticipating Change in Rural Areas	Deaton, B.

Product Development and Enhancement Through Value Chain Theme

Project #	Start Date	Approved End Date	Approved Program	Title	Project Leader
026257	1-Jul-05	30-Apr-09	Prod Dev	Industrial-scale bioactive cellulose filters using recombinant antibodies and antigens produced and purified from transgenic tobacco.	Hall, C.
026476	1-Apr-07	31-Oct-09	Prod Dev	Alfalfa as a Bioproduction Platform: Delivery system for a broad-spectrum veterinary vaccine and development for future bioproduct applications.	Wolyn, D.
026262	1-Oct-05	1-Oct-09	Prod Dev	Production of novel industrial starches using waxy-based cereal crops.	Emes, M.
026606	01-May-08	30-Apr-10	Prod Dev	Decontamination of Raw Milk using a Novel Ultraviolet Light Reactor to Ensure Pathogen Inactivation and Retention of Protein Functionality	Warriner, K.
026587	01-May-08	30-Apr-11	Prod Dev	Understanding the behaviour of oil-water-monoglyceride nanostructures in baked food matrices and evaluating human health benefits following consumption	Seetharaman K.

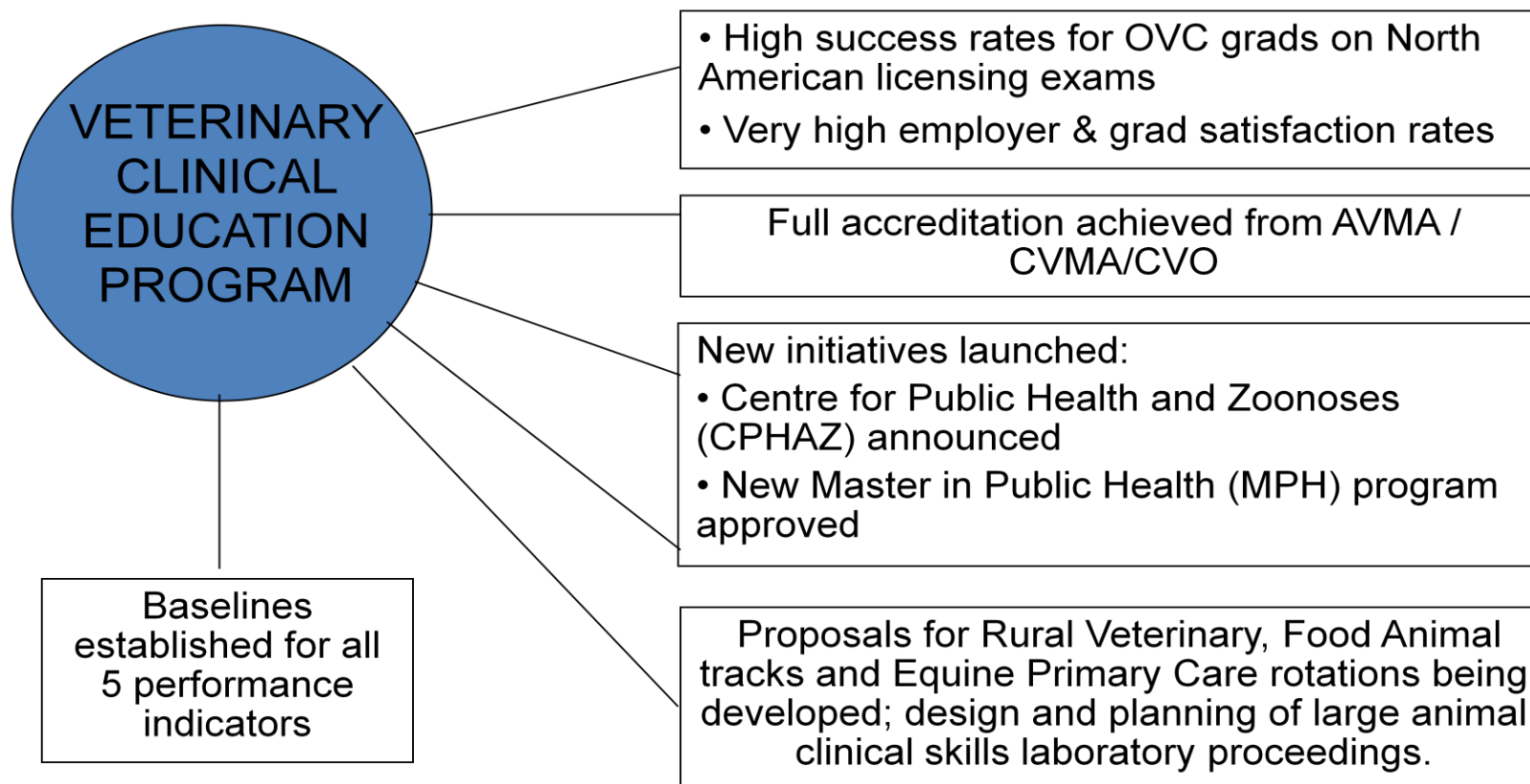
Emergency Management Theme

Project #	Start Date	Approved End Date	Approved Program	Title	Project Leader
026546	1-May-07	30-Apr-10	Emerg Mgmt	Development of novel methods for the control of poultry coccidiosis.	Barta, J.
026614	1-Jan-08	31-Dec-09	Emerg Mgmt	Development of an avian cell line	Nagy, E.

VETERINARY CLINICAL EDUCATION PROGRAM

Selected Performance Indicators and Accomplishments

Program Objective: Support the Ontario economy by training professionals skilled in maintaining the health and welfare of animals and their interrelationships with people and the environment



Veterinary Clinical Education Program

Performance Indicators

Data collection and establishment of baselines for each Performance Indicator (PI) was completed by with the assistance of OMAFRA. The following table summarizes the VCEP Program's performance according to the 5 PIs in the Agreement.

Key Outcome		Maintain AVMA/CVMA accreditation.
Performance Indicator VCEP1	Level of accreditation achieved - Maintain AVMA/CVMA accreditation	
	Metric	Review of accreditation reports in order to assess performance and maintenance of accreditation.
	Baseline:	Baseline Established, and Achieved
	Target:	2009-2013: maintain AVMA/CVMA Accreditation
	Results (2008/09):	In March 2009, OVC achieved full accreditation as determined by the AVMA/CVMA site review team. These two organizations represent the highest standard of achievement for veterinary medical education in the world. In the accreditation process, a veterinary college is reviewed to determine whether it meets 11 accepted standards of quality as developed by the Council of Education of the AVMA. The accreditation process focuses on the Doctor of Veterinary Medicine program and the institutional resources, infrastructure and personnel that support it. An institution or program is deemed fully accredited. Graduation from a fully accredited institution permits graduates to take the national licensure examination for professional practice in Canada and the USA.

Key Outcome	Attracts and retains highly qualified clinical faculty from around the world as a source of new knowledge.	
Performance Indicator VCEP2	An appropriate number of high quality faculty.	
	Metric	Number of faculty provided by U of G OMAFRA Partnership Funding
	Baseline:	Baseline established as the number of faculty positions supported through the Agreement in 2009/10, at 12.4 faculty FTEs.
	Target:	2009-2010: maintain 2008 level 2010-2013: baseline level likely to decline due to flatlined budget.
	Results (2008/09):	See Faculty FTE Table below

OVC Faculty FTE ¹ (Base funded in 2008-2009)

Department	Discipline		Assistant Professor	Associate Professor	Professor	Total
Pathobiology	Anatomic Pathology		2.00	3.00	1.00	6.00
	Avian Pathology				1.00	1.00
	Bacteriology			1.00	2.00	3.00
	Clinical Pathology			2.00	2.00	4.00
	Comparative Pathology			1.00	1.00	2.00
	Immunology			1.00	2.00	3.00
	Laboratory Animal Science				1.00	1.00
	Parasitology			1.00	1.00	2.00
	Virology		1.00		2.00	3.00
	Wildlife/Zoo Pathology				1.00	1.00
	Sub-total		3.00	9.00	14.00	26.00
Clinical Studies	Anesthesiology		1.00	3.00	-	4.00
	Cardiology		-	-	1.00	1.00
	Companion Animal Medicine		2.00	1.00	2.58	5.58
	Companion Animal Surgery ²		3.00	2.00	2.00	7.00
	Dermatology		-	2.00	-	2.00
	Emergency and Critical Care		1.00	-	1.00	2.00
	Large Animal Medicine		2.00	-	2.00	4.00
	Large Animal Surgery		2.00	2.00	1.00	5.00
	Neurology		1.00	1.40	-	2.40
	Oncology		1.00	-	-	1.00
	Ophthalmology		1.00	1.00	-	2.00
	Radiology		2.00	-	0.20	2.20
	Sub-total		16.00	12.40	9.78	38.18
Population Medicine	Epidemiology		5.13	2.00	2.00	9.13
	Equine Health Management			1.00		1.00
	Poultry Health Management		0.07			0.07
	Public Health (incl. CPHAZ)			1.83	2.13	3.96
	Ruminant Health Management			4.00	3.00	7.00
	Swine Health Management				2.00	2.00
	Theriogenology		2.00			2.00
	Sub-total		7.20	8.83	9.13	25.16
Biomedical Sciences	Anatomy		1.00		1.00	2.00
	Cellular/Molecular Biology		1.00	2.00	2.00	5.00
	Neurology		1.00		1.00	2.00
	Pharmacology/Toxicology			3.00	1.00	4.00
	Reproductive Biology		1.00	3.68	2.00	6.68
	Physiology		1.00		2.00	3.00
	Sub-total		5.00	8.68	9.00	22.68
	TOTAL		31.20	38.91	41.91	112.02
Notes						
1. In 2008/09 VCEP funding contributes support equivalent to 12.40 faculty which is 11% of the total OVC 112.02 faculty FTE. 2. Includes position of Dean of the College						

Key Outcome	Provide a comprehensive training program for undergraduate veterinary students.																																		
Performance Indicator VCEP3	Readiness of graduates for employment (Provide a comprehensive training program for undergraduate veterinary students)																																		
	Metric	% level of students and employers satisfaction regarding readiness for employment.																																	
	Baseline:	Baseline for agreement will be the results for the 2008 graduating class																																	
	Target:	2009-2013: maintain percentages from 2008 annual student and employer surveys																																	
	Results (2008/09):	2008/09 data were collected electronically via a web survey for the first time. Because of technical complications we do not feel that the results are valid and reportable. In lieu of those values below are the 2007/08 outcomes: Of graduates who responded, 97% were satisfied (i.e. rated their performance as Superior, Very Good, or Good) with their overall performance/competence to do the job for which they were hired. Of the employers who responded 95% were satisfied (i.e. rated new graduates as Superior, Very Good, or Good) with their employee's overall performance/competence to do the job for which they were hired.																																	
Key Outcome	Provide a comprehensive training program for undergraduate veterinary students.																																		
Performance Indicator VCEP4	Graduating students' performance in the North American Veterinary Licensing Exam (NAVLE).																																		
	Metric	% of VCEP students who pass the North American Veterinary Licensing Exam (NAVLE), compared to the % average of other North American institutions.																																	
	Baseline:	New PI, therefore agreement that the baseline be established on performance data from the 2008/09 fiscal period. Baseline is "VCEP performance in the NAVLE equal to or better than the overall pass rate for the entire NAVLE student population".																																	
	Target:	2009-2013: Achieve VCEP performance in the NAVLE equal to or better than the overall pass rate for the entire NAVLE student population.																																	
	Results (2008/09):	<table><tr><td></td><td colspan="2">Dec 08 & Apr 09</td><td colspan="2">Dec 07 & Apr 08</td></tr><tr><td></td><td>OVC</td><td>All</td><td>OVC</td><td>All</td></tr><tr><td>Number Taking Exam</td><td>106</td><td>3009</td><td>110</td><td>2903</td></tr><tr><td>Number Passing</td><td>104</td><td>2908</td><td>107</td><td>2816</td></tr><tr><td>Percent Passing</td><td>98</td><td>97</td><td>97</td><td>97</td></tr><tr><td></td><td></td><td></td><td></td><td></td></tr></table>					Dec 08 & Apr 09		Dec 07 & Apr 08			OVC	All	OVC	All	Number Taking Exam	106	3009	110	2903	Number Passing	104	2908	107	2816	Percent Passing	98	97	97	97					
	Dec 08 & Apr 09		Dec 07 & Apr 08																																
	OVC	All	OVC	All																															
Number Taking Exam	106	3009	110	2903																															
Number Passing	104	2908	107	2816																															
Percent Passing	98	97	97	97																															

Key Outcome	Graduate individuals highly qualified in relevant post-graduate specialties.	
Performance Indicator VCEP5	Number of students starting and completing post-graduate studies each year by area related to OMAFRA priorities.	
	Metric	Number of VCEP funded and non-VCEP funded students working on projects related to OMAFRA priorities. The metric would include both students beginning and completing post-graduate studies.
	Baseline:	New PI, therefore agreement that the baseline be established on data applicable to fiscal 2008/09 fiscal period. The VCEP funding supports 54% of the DVSc students (equivalent of 15.1 out of 28 positions).
	Target:	2009-2013: maintain funding for 54% of the DVSc positions from VCEP
	Results (2008/09):	See DVSc enrolment Table below

TOTAL ENROLMENT NUMBER OF DVSC STUDENTS

WITH SUPPORT FROM VCEP FUNDING ¹

May 1, 2008 to April 30, 2009

Department	Discipline	Total Number of Students Enrolled in 2008-09 (Headcount) ²			
		In Program	New	Graduating	Total # Enrolled
Pathobiology	Anatomic Pathology	2	2	1	5
	Clinical Pathology	2	0	0	2
	Avian Exotic	0	0	0	0
	Laboratory Animal Science	0	1	0	1
	Oncology	0	0	0	0
	Sub-total	4	3	1	8
Clinical Studies	Anesthesiology	1	1	2	4
	Companion Animal Surgery	2	1	1	4
	Companion Animal Medicine	1	1	1	3
	Large Animal Medicine	2	1	1	4
	Large Animal Surgery	3	0	1	4
	Emergency and Critical Care	0	1	1	2
	Neurology	2	0	0	2
	Cardiology	0	1	1	2
	Radiology	0	0	0	0
	Sub-total	11	6	8	25
Population Medicine	Health Management	2	1	1	4
	Theriogenology	1	0	0	1
	Sub-total	3	1	1	5
Biomedical Sciences	N/A	0	0	0	0
	Sub-total	0	0	0	0
	OVC Total	18	10	10	38

Notes

1. VCEP funding is \$506k, which is 54% of the \$928k base budget which supports the College funded DVSc positions.

2. The enrolment numbers are based on headcount not FTE. "In-program" students are enrolled for the full fiscal year. Students entering and exiting the program are enrolled for part of the year

3. The total number of base funded positions = 28 of which VCEP supports the equivalent of 15.12

NEW INITIATIVES

Knowledge Translation and Transfer (KTT) Program and Partnership Communications

Through the negotiation of the renewed OMAFRA/UofG Partnership, the Ministry and University agreed that there needed to be a new focus on Knowledge Translation and Transfer (KTT) to improve the dissemination and commercialization of research advances to the broad diversity of client groups (direct users of the research results). It was also agreed that an enhanced emphasis on communications to the other stakeholders and the public at large (general beneficiaries of the application of research results) was needed to help ensure that Ontario taxpayers hear about the value of the research funded by the provincial government under the Partnership.

KTT Program

The KTT initiative established under the OMAFRA/UofG Partnership Agreement in 2008 is designed to accelerate the transformation of knowledge into use. This new program includes long-established practices in extension and technology transfer, building and expanding on them. Over the past year, significant progress has been made in the development and early implementation of the program, with full roll-out anticipated to be complete in Fall 2009.

Achievements to date include:

- The establishment of a joint OMAFRA/UofG KTT Program Leadership committee, consisting of the Research Program Management Committee Co-Chairs (Rich Moccia and Ken Law, with Jeff Schieck filling in on an acting basis up until August 2009), with input from Ken Hough, Director, Research Facilities Management & OMAFRA/UofG Agreement, UofG, and Michelle Schurter, Manager, Innovation and Knowledge Management, OMAFRA.
- The appointment of dedicated staff resources from both OMAFRA and UofG to undertake roles in the development and implementation of the KTT program.
- The development and adoption of a project model (internal OMAFRA/UofG planning/working document) which provides a framework for the delivery of the KTT program by outlining purpose, goals, target areas, key deliverables, cost estimates, budget allocations, performance measures, etc.
- An extensive literature review to identify current principles and practices in KTT as these are applied in various jurisdictions around the world. Findings from the review led to the development of a KTT 'Best Practices' framework to be used to evaluate and optimize existing and proposed KTT activities. A key component of the framework is to focus KTT efforts on three target areas:
 - **the science - policy interface** -- research outcomes are used as the evidence base for policy development and decisions

- **program application or ‘technical information exchange’** -- research results (general knowledge, publicly disclosed technical advances, public-good information, etc.) are disseminated to the broad array of user communities (ideally in response to needs defined by these users) for practical applications and implementation e.g. use in production, processing, program development, improvement of best practices, service delivery etc.
 - **commercialization** – protected intellectual property (of a product, process or other invention) is licensed or released to commercial partners (who ideally have been directly engaged in the research effort) for additional development and implementation in the business marketplace.
- ‘Environmental scans’ of current KTT, extension, and user outreach programs at both OMAFRA and UofG to identify existing strengths to build on as well as possible areas for improvement.
- The UofG is now in the process of hiring for two contact ‘knowledge mobilization managers’ to fill out the KTT program staffing. The target is to have these two positions filled by October. This includes the development of position profiles and job factsheets for these two full-time KTT professionals, one to focus on the science – policy interface and the other to focus on the ‘program application’ area.
- The appointment of a Technology Transfer Manager in the UofG’s Business Development Office (BDO) as of July 2009, who will focus on the commercialization of research funded through the OMAFRA/UofG Partnership. This position is supported jointly through the KTT program budget (50%) and the University of Guelph BDO (50%).
- The development of an agreement between UofG and the Vineland Research and Innovations Centre (VRIC) regarding the integration of resources for the development, administration and implementation of KTT activities. Under this agreement, UofG will provide a 50 per cent contribution towards the salary, benefits and operating costs for a KTT professional located at Vineland to focus on commercialization of research developed at VRIC. The search for a qualified candidate for this position is currently in progress.
- Inclusion of reviews of KTT plans as a component of the overall research process was initiated in Spring, 2009. Researchers were asked to include a summary of their KTT plans as part of their submissions. Plans were assessed by OMAFRA KTT staff, with comments provided for consideration by proposal review committees for each of the seven OMAFRA Research Themes. Intended to raise awareness regarding the role of KTT in new research initiatives, this exercise also provided researchers, reviewers and KTT staff with more information regarding existing practices and potential areas for further investigation. Plans are currently in development for refining the review process for inclusion in the next call for proposals (Fall 2009).
- A presentation entitled *An Ontario Example of Knowledge Translation and Transfer: What is it and is it Different from Extension?* was presented by Elin Gwyn, Research Analyst - OMAFRA and Owen Roberts, Director of Research Communications at the University of Guelph, at the 2009 ACE-NETC (Association of Communications Excellence in Agriculture, Natural Resources, and Life and Human Sciences; and the National Extension Technology Conference) held June 6 to 10, 2009 in Des Moines,

Iowa. A copy of the presentation can be found at <http://www.slideshare.net/acenetc/knowledge-translation-and-transfer> .

- Plans are currently in development for staging a number of workshops for UofG and OMAFRA personnel, as well as stakeholder groups, to be held over the next 6-8 months. These workshops will promote information exchange and discussion as well as provide updates and additional training for the effective implementation of the KTT initiative.

Communications

As part of the negotiations for the new Agreement, enhanced communications -- both internal (within OMAFRA and the UofG) and external (to the broader community of client groups and Ontario citizens) -- was identified as a high priority. To this end, a joint OMAFRA/UofG Communications Plan for the Partnership became part of the overall responsibilities in Schedule A of the Agreement, and was subsequently developed, outlining the key messages, target audiences and vehicles for reaching those audiences. A draft plan was tabled at the September 30, 2008 Executive Committee meeting and then approved at its next meeting March 4, 2009.

Another commitment made to providing better communications is the part-time (.20 FTE) appointment of Owen Roberts to the UofG side of the Partnership secretariat. Owen is the director of Research Communications at the UofG, and the director (and creator) of the successful Students Promoting Research Awareness and Knowledge (SPARK) program. He is also the Academic Coordinator for the Agricultural Communications Diploma Program. Owen's expertise has been instrumental in the creation and successful implementation of the communications plan.

The communications initiatives undertaken through the communications plan are managed within the overall KTT initiative under the Partnership because the communications activities contribute directly to the objectives of the KTT program. This includes expanding and enhancing stakeholders' awareness of activities, events, accomplishments and outputs of the various Partnership programs (Research, the Veterinary Clinical Education Program, and the Agri-Food and Animal Health Laboratory Programs). This awareness stimulates opportunities for stakeholders to provide informed input into planning and delivery of these programs. For example, stakeholders learning of specific research projects may contact the program managers (UofG Research Program Directors or OMAFRA Director Champions) or may communicate directly with the researchers about how the research findings could assist in addressing their particular needs, or suggest how further research would do so.

Several communications initiatives, outlined below, have been launched in accordance with the plan.

News@Noon

News@Noon is a lunch-hour speaker series, held approximately every six weeks. It alternates venues between 1 Stone Road, and somewhere on the UofG Campus.

- Five presentations were made in 2008/09
- Topics were:
 - Highlights of the Deloitte study on the impact of the OMAFRA/UofG Agreement, along with an example of an important research development (Dr. Steve Leeson's research on Omega 3 eggs)
 - The review of activity in the Animal Health Laboratory

- Dr. Chris Hall's bio-filter research (project falls within the Bioeconomy Theme),
- Public plant breeding, focusing on the UofG soybean breeding program with Istvan Rajcan (supported through the Production Systems Theme), and
- Dr. Alfons Weersink, presenting "The Food Crisis - A Look Back & The Way Forward "
- Up to 100 people attended each event

The Buzz

The Buzz is an electronic community news vehicle for and about the OMAFRA/UofG Partnership. The Buzz contains 150- word articles about research, research stations, news and coming events related directly to any of the programs supported through the Partnership.

- First issue was December 19, 2008
- As of August 2009, the total number of issues published is 13
- Produced bi-weekly
- Originally meant primarily as internal communications vehicle within the Ministry and the University, circulation now includes at least 15 people outside of the UofG or OMAFRA through direct distribution or subscription. It is anticipated that external circulation will be expanded in the coming year.
- Direct distribution is 345 UofG personnel (administrators then forward to their departmental faculty and staff) and all OMAFRA staff.
- A Buzz writing workshop for contributors was held June 12, 2009 at the Arboretum – with 25 people in attendance. Feedback from the exit survey was extremely positive, and more workshops are planned. Comments included: "Learned several new writing tips", "Good job gang", "I found the workshop very good" and "Great idea".

SPARK

Between May 2008 and May 2009, the combined efforts of students in Students Promoting Awareness of Research Knowledge (SPARK), and the agricultural communication classes, both based at the UofG, produced an extensive list of published and broadcast news stories about a variety of OMAFRA-sponsored projects. This listing can be found on the UofG 'OMAFRA Agreement' website at www.uoguelph.ca/research/publications/index, as well as in Appendix A.

These stories have appeared in a number of different publications, and cover the spectrum of the University's many different agricultural research institutions and sites, including the regional campuses and the research stations, as well as the colleges on the main Guelph campus.

The primary vehicles for publication are the Ontario farm media, the UofG *Research* magazine and the University of Guelph main website and research website. Through a continuing agreement with CKNX radio station located in Wingham, Ontario, students contribute *SPARKAir* radio pieces which profile agricultural research at the UofG. The *SPARKAir* program was expanded this year to include video news stories about the OMAFRA/UofG Partnership, and more details about this program are below.

The Spring 2009 edition of *Research* magazine focused on water management, many articles featured OMAFRA/UofG research, and the partnership supported this magazine through a full page ad promoting the partnership's water research activity and strengths.

A new partnership was formed with the Canadian Farm Business Management Council (CFBMC) in January 2009. SPARK provides CFBMC with agriculture research stories for their website each month

In total, 43 print stories were published by SPARK about the partnership as well as significant content in each of the MaRS Landing four *Satellite* newsletters. As well, 21 SPARKAir radio stories were aired.

SPARK AIR – Partnership sponsored video stories

Over the course of the summer of 2009, the Partnership sponsored an expansion of the SPARK and SPARK AIR program. This expansion program has included:

- Two SPARK students hired for the summer
- Video equipment purchased including two high definition camcorders; tripods; a MAC pro computer with editing software; audio equipment such as transmitters, receivers, hand held and lapel microphones; and an external hard drive.

SPARK AIR features news-like video stories about research coming out of the OMAFRA/UofG Partnership. The students produce the videos from the beginning to end by setting up the interview, creating the story based on the researcher's information, reporting the story on camera and being the videographer, collecting appropriate shots and finally editing all the clips into an informative three-minute story.

A key to SPARK AIR is a partnership with commercial agricultural information provider www.farms.com. Ten stories have been completed and posted to www.farms.com's main page, a popular website for agricultural expertise, with six more in production. They will be posted every other week from September 14 to November 28. Feedback from this initiative, from key OMAFRA and UofG staff as well as farms.com has been encouraging. The program further raises the profile of agri-food research, the Partnership, the University and the Ministry and program administrators say potential outlets for these video stories are significant.

Yearbook

One of the key communications initiatives was to create a 'reader friendly' annual publication, featuring highlights and key accomplishments of the Partnership programs, for a broader and more general audience than would normally view the Agreement Annual Report. This resulted in the 32-page special issue of *Research* magazine, focusing on the Partnership called the "2009 Agri-food Yearbook".

- Presented in sections about AHL, AFL, seven research themes, VCEP and new initiatives HQP and KTT
- Printed and delivered in August 2009.
- Three stories from the yearbook were featured on the OMAFRA Newsroom website in August, 2009
- OMAFRA video communications staff are working on creating video stories from the Yearbook to be posted on the Ontario.ca Newsroom
- The Yearbook is featured in the "Learn More" section of the UofG's 'OMAFRA Agreement' website to ensure broad availability (www.uoguelph.ca/research/omafra/index.shtml)
- The Yearbook will also be included as a 'chapter' within the OMAFRA/UofG Partnership "Annual Report"

Town Hall meetings

- Four town hall meetings (not including individual research theme town hall meetings) were held to discuss the implementation and progress of the Partnership.
- Topics included overview of the new agreement for UofG faculty and staff.
- This information was also presented at the regional campuses.

Partnership joint events with the OMAFRA Deputy Minister and UofG President in attendance

- Partners for Progress launch of the new Agreement – April 29, 2008
- Partnership BBQ – get together and thank you to those who worked on the negotiations – July 23, 2008
- Partnership dialogue – facilitated discussion about the new programs KTT and HQP – October 6, 2008

Affiliated Researcher Program

This program was launched in June 2008. It gives full access to the UofG Library system – including remote access – to OMAFRA staff who work on delivering the OMAFRA/UofG Agreement programs. There are currently 100 affiliated researchers. A short survey was sent out in October, 2008 asking users how the program was working for them. Replies indicated that the program was excellent, but training on the system was requested. In response to this feedback, two training sessions were held May 19 and June 1, 2009.

Highly Qualified Personnel Program (HQP)

The HQP Scholarship Program is a new component of the OMAFRA/UofG Agreement and is intended to provide training and development opportunities that will enhance the “market-readiness” of graduate students enrolled in this program by providing experiential learning opportunities beyond what is available to the typical graduate student.

The goal of this program is to provide stipends for up to 40 students at any one time enrolled in a range of existing departmental programs in MSc Thesis and Course-work degrees and PhD programs. It is expected that most awards will be given to students enrolled at the University of Guelph, but is not exclusive in this regard. Opportunities to participate in this program will be made available to graduate students at other universities with which we are partnered in priority research areas. As well, international students will be encouraged to apply, in keeping with the province’s targeted objectives of diversity and inclusiveness. Students from disciplines other than the life sciences can apply to the program, as long as their research addresses the priorities needs within the Partnership.

HQP students will undertake research and/or courses as prescribed by their faculty advisor and advisory committees. The only additional course requirement for support within the OMAFRA HQP program is student enrollment in a new course specific to the program. This course will expose students to various aspects of business practices, commercialization and the impact of Agrifood industries on society in general. The course will be composed of various modules, with students selecting those that best fit their degree program and career development pathway. Specifically, the draft curriculum currently under review has modules in Business Development, Economics of Ontario Agrifood Industries, Patent Protection, OMAFRA Structure and Support,

Role of Agrifood Practices in Quality of Life and Societal Issues in Agrifood Production, Food Processing and Food Marketing.

In addition to enrolling in the new graduate course, all students must also participate in at least one semester of job shadowing/work experience. For thesis degree programs this activity is expected to be a work semester aligned with the corporate sponsor of the research program. If such collaboration is not available help will be provided to the student to locate a commercial or government site for their work experience. The location of the work semester/job shadowing will be approved by the co-coordinator of the HQP program. The HQP advisory committee will help with identifying such work locations for MSc course work students or those students not directly funded by an industrial partner.

As well, the OMAFRA HQP program is partnering with Accelerate Ontario for joint funding of some work experience programs. This will bring leveraged funding to the HQP program, and is an unanticipated benefit of the universities current partnership with Accelerate Ontario. Full details are given at www.accelerateontario.ca. The student will work with an Accelerate Ontario representative to apply for these funds and develop plans for their work semester.

The student's research program and their job shadowing experience must conform to the research themes and research priorities outlined in the 2008-2013 OMAFRA/UofG Agreement.

An advisory committee for the program has been struck, and a Co-ordinator for the program – Dr. Steve Leeson -- was announced in this role in July, 2009. As leader of an applied research program with exceptionally strong ties to producers, industry and OMAFRA while a faculty member for more than 30 years within the Department of Animal and Poultry Science, and having served most recently for a 5 year term as Department Chair, Dr. Leeson brings a tremendous breadth of experience working with graduate students and with graduate curriculum programming.

In his role as Co-ordinator the HQP program, Dr. Leeson will work closely with the AVPR Agrifood and Partnerships, plus eight UofG Research Program Directors who oversee the OMAFRA/UofG Research Themes, the corresponding OMAFRA Director Champions, and others within the UofG and OMAFRA communities to build and implement the HQP program.

An announcement regarding the launch of the program is expected to be released in the early Fall of 2009.

AHSI Annual Progress Report

Overall Summary of Period Achievements Relative to Targets:

In 2008/09, 13 research projects were approved for funding under the Animal Health Strategic Investment (AHSI). Of these, 4 were classified as new tests and 9 were classified as surveillance or survey projects. Of the 9 surveillance projects, one is the Farm-Call Syndromic Surveillance as specifically called for in the AHSI Plan.

Three new pieces of equipment were purchased in 2008/09 using AHSI funding that will support the development of new tests both within AHSI projects and in turn within the AHL labs in general.

A total of 4 staff were hired in 2008/09 to support the AHSI project as a whole.

Follow up investigations have been conducted in 2008/2009; however, much of the testing performed has been in the interest of on-going monitoring, as opposed to the larger scope investigations as envisaged in the AHSI plan. The total amount spent in 2008/2009 under Follow up Investigation was \$5,351.50.

Emergency Response (ER) and Business Continuity Planning (BCP) were initiated in 2008/09; however, in comparing the Emergency plans section of the AHSI Plan to the OMAFRA/University of Guelph Agreement, Schedule G, it was noticed that the timelines between the two are disparate, although the intent of both documents is the same (with respect to ER and BCP). As such, it has been proposed to default to the ER/BCP timeline as outlined in Schedule G of the OMAFRA/University of Guelph Agreement.

Tests

AHSI Project 09-02: Determination of the prevalence of anthelmintic resistance in Ontario sheep flocks with indicators of gastrointestinal parasitism (Project Lead: Dr. Andrew Peregrine).

AHSI Project 09-05: Development and assessment of a diagnostic ELISA for *Clostridium perfringens* Cpb2 toxin, with special reference to swine and cattle (Project Lead: Dr. John Prescott).

AHSI Project 09-08: Mycoplasma speciation by molecular biology assays (Project Lead: Dr. Hugh Cai).

AHSI Project 09-11: Development of molecular typing method for the characterization of *Giardia duodenalis* (Project Lead: Dr. Hugh Cai).

Surveillance:

AHSI Project 09-01: Disease surveillance in a selected group of hog producers with minimal exposure to veterinary diagnostic services (Project Lead: Dr. Tim Blackwell).

AHSI Project 09-03: Enhanced surveillance for viral and bacterial pathogens in commercial broiler chicken flocks in Ontario (Project Lead: Dr. Michele Guerin).

AHSI Project 09-04: Surveillance of disease agents of public health and agricultural significance in wildlife living on farms in Ontario (Project Lead: Dr. Claire Jardine).

AHSI Project 09-06: A survey of risk factors associated with condemnation of sheep carcasses due to *Cysticercus ovis* infection (Project Lead: Dr. Paula Menzies).

AHSI Project 09-07: Integrating milk based cow and bulk tank test data, dairy cattle inventory data and GIS location data into the AHL surveillance capacity (Project Lead: Dr. David Kelton).

AHSI Project 09-09: Investigation of infectious etiology of small ruminant abortion in Ontario with emphasis on *Chlamydophila* spp. and *Coxiella burnetii* (Project Lead: Dr. Hugh Cai).

AHSI Project 09-10: Epidemiological analysis of *Mycoplasma bovis* isolated from Canada in the past 30 years (Project Lead: Dr. Hugh Cai).

AHSI Project 09-13: Refining the Ontario Swine Veterinarian-Based Surveillance (OSVS) system for Real-Time Surveillance and Integration with Laboratory-Based Surveillance (Project Lead: Dr. Bob Friendship).

Farm-call surveillance

AHSI Project 09-12: *Veterinary Farm Call Syndromic Surveillance* (Project Lead: Kathy Zurbrigg) is fulfilling the requirement for farm-call surveillance and was initiated in Q4 2008/2009.

Emergency Plans

No work was specifically conducted in the area of Emergency Response plans in 2008/2009; however, the business services baseline inventory (BSBI) and the hazard identification and risk analysis (HIRA) performed in 2008/2009 (and discussed further in 3.2.1) will help to form a basis for emergency response planning as well as business continuity planning.

Business Continuity Plans

Under the guidance of Dave Colling from OMAFRA, good progress was made in 2008/2009 towards the initial stages of Business Continuity Planning (BCP) for the AHL in the form of a draft business services baseline inventory (BSBI) as well as a draft hazard identification and risk analysis (HIRA) document. The following are excerpts from the HIRA report prepared by Dave Colling:

“The Business Service Baseline Inventory template was used by the AHL to gather the necessary baseline information for establishing specific time-critical business functions and critical infrastructure (at the macro level). For each separate lab, business and services were identified broadly (or as operationally realistic). In some cases similar services are delivered by the same team of employees, who may utilize the same or similar resources and inputs. To the extent possible, work areas with commonalities (i.e. in the same location) were identified once and described as a group of services and named accordingly. In addition, the inventories captured a general outline of the client base for each service and listed critical equipment dependencies (IT and infrastructure) that each service depends on.”

“Once the BSBI was complete, the AHL staff undertook the HIRA part of the exercise. The HIRA was used to identify areas of potential vulnerabilities and to identify the areas at greatest risks to the laboratories and, by extension, to clients and customers (OMAFRA included). All the hazards which potentially could cause an interruption in service delivery were assessed. This process used an international standard listing of 37 hazards...”

Veterinary Clinical Education Program

The following initiatives are critical components in the development of the OVC's Integrated Plan and maintenance of our full accreditation status.

(http://www.ovc.uoguelph.ca/planning/doc/ovc_integratedPlan_080125.pdf)

Veterinary Public Health

Presented below are two initiatives related to the area of veterinary public health that speak directly to the interests of OMAFRA and to OVC's priorities defined in our Integrated Plan.

Centre for Public Health and Zoonoses (CPHAZ) (<http://www.ovc.uoguelph.ca/cphaz/>)

The University of Guelph Centre for Public Health and Zoonoses (CPHAZ) was officially launched on May 4, 2008. As part of the opening, a scientific symposium was held on May 5 and was attended by over 170 people from a wide range of animal and human health organizations. Dr. Jan Sargeant was appointed the first Director of the Centre of CPHAZ. She also received a Canadian Institutes of Health Research (CIHR) Chair in Applied Public Health. The McNabb House on the OVC Campus has been allocated to the CPHAZ as its administrative home and space for some faculty and graduate students.

The Centre co-ordinates existing, and promotes new, collaborative, interdisciplinary research activities designed to enhance our capacity to solve problems and implement solutions in public health at the human/animal interface throughout Canada and the world. The initiative brings together a consortium of researchers from the University of Guelph, the Public Health Agency of Canada, the Canadian Cooperative Wildlife Health Centre, the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), the National Laboratory for Zoonotic Diseases and Special Pathogens and others. The Centre supports the advanced education of students, veterinarians and scientists to help meet the growing need for expertise in public health and zoonoses and in sound policy and decision-making in the public health sector.

Over the next year the Centre will finalize a business plan and develop programs under the following thematic areas; Methodological Expertise, Zoonoses, Antimicrobial Resistance, Environment, Food Safety, Public Health, Systematic Reviews and Water Safety. The need and importance of such a Centre has been accentuated by the recent events related to the H1N1 flu where several Centre faculty have been called upon to serve as both scientific and media resources. As part of the public outreach component a web blog has been developed to provide factual information to the public on safe pet ownership related to zoonotic disease risk (<http://www.wormsandgermsblog.com/>).

Recognition for the Centre was also achieved through the receipt of \$1 million from the Canada Foundation for Innovation's New Initiatives Fund. The funding goes towards infrastructural support for equipment and facilities for the CPHAZ to conduct state-of-the-art research in animal-related aspects of public health, particularly zoonotic diseases.

Masters in Public Health

The Ontario Council on Graduate Studies (OCGS) approved the new Masters in Public Health degree in the winter 2009. The Master of Public Health (MPH) program is a 5-semester professional degree with concentration in epidemiology, environmental public health, infectious diseases, and zoonotic, foodborne and waterborne diseases. The MPH program prepares public health students and professionals for careers in which they will address the present and future needs of public health in Ontario, Canada, and internationally. Our graduates will emerge as influential local, national, and international leaders committed to improving quality of life by protecting and promoting the health of their communities and by anticipating and preventing disease from both a policy and a science perspective.

This graduate program is being developed to expand the pool of highly-educated personnel in this field, with the first class having started in September 2008. There has been active recruitment of potential DVM applicants to the degree program and there are currently five veterinarians receiving stipend support starting in the Fall 2009 cohort.

The posting for a contractually limited faculty position to support teaching in the MPH program and undergraduate DVM curriculum closed August 21, 2009. It is expected to have a person in place by the end of September.

Rural Veterinary Practitioner Development

Large Animal Clinical Skills Facility

Two agencies require us to house our teaching animals separately from hospital patients (CVMA/AVMA Accreditation and the Canadian Council on Animal Care). Thus, all teaching animals must be removed from the Hospital and a plan in place for their permanent housing. This plan will consolidate the housing of our large teaching animals (cattle, sheep, pigs and horses) into one facility and create a clinical skills development laboratory. Here students will develop the critical hands-on skills with these animals in a safe and appropriate learning environment both through scheduled teaching activities and by independent learning.

The architectural firm of Randy Wilson Architects Inc. has been hired as the lead architect to design the clinical skills teaching laboratory. In addition, Dr. Roy Abernathy of Jova/Daniels/Busby Architects has been commissioned to serve as an external reviewer as he is both an architect and a veterinarian who has designed numerous veterinary teaching facilities. The schematic design for this facility has been approved by the University's Board of Governors and it is anticipated that a final design will be sent out for tender by September 2009 with construction to begin in October and completion by early 2010.

Rural Veterinary Practice

The intent is to provide focused experiential learning opportunities for students interested in practicing in rural areas and prepare them to have sustainable careers. These initiatives are very much in the developmental stage and will require stakeholder input to develop them into full proposals and implementation.

A working group has been tasked with developing a proposal related to the implementation of a plan for the delivering of both a Rural Veterinary Track and a comprehensive Food Animal Track

within the final year of the DVM Curriculum. This proposal is to include the feasibility and implications of a targeted admissions process for agricultural focused students and a directed experience through the first three years of the program. A pilot project will be run in the upcoming academic year where the Phase 4 students in the Food Animal Stream will be placed in a local food animal practice that has agreed to provide an enriched experiential learning opportunity that extends beyond the current Veterinary Externship course and other external electives currently available to students. A small trial-run occurred last year and will be refined for the upcoming cohort of final year food animal stream students.

A second working group has been established to determine the learning objectives and operational plan for an equine primary care rotation. We currently offer primary care experiential learning in cattle, small ruminants and swine through our existing VCEP supported field service clinics. We do not operate an equine field service, hence the need to develop this experiential learning opportunity in order to ensure graduating students have the necessary primary care skills to be able to deliver veterinary services to rural horse owners.

OTHER REPORTING

Livestock Inventories

	Opening May 1, 2008	Sold	Died ⁽¹⁾	Transferred		Born or Acquired	Closing April 30, 2009
				in	out		
Alfred							
dairy	101	64	6	0	0	48	79
Kemptville							
dairy	70	40	3	0	0	40	67
New Liskeard							
beef	0	0	0	0	0	0	0
Ridgetown							
dairy	73	35	4	0	0	46	80
beef	28	7	4	0	0	12	29
swine	512	931	28	26	0	754	333
Guelph							
Arkell equine	56	0	0	132	133	4	59
Arkell poultry	8,592	994	6,694	100	133	7,949	8,820
Arkell swine	1,891	4,580	2,121	0	463	6,938	1,665
Alma aqua	74,716	22,441	52,368	1,515	14,924	87,943	74,441
Elora dairy	298	120	30	6	24	153	283
Elora beef	521	375	8	24	3	371	530
Ponsonby dairy	99	42	11	4	12	57	95
Ponsonby (GAF) ⁽²⁾	150	211	60	158	147	181	71
Ponsonby sheep	322	107	17	0	81	263	380
Clinical Studies							
dairy	39	26	0	20	0	0	33

⁽¹⁾ These figures include animals that are born dead and those which are euthanized for humane, disease and research reasons.

⁽²⁾ General Animal Facility

University of Guelph/ OMAFRA Equipment Inventory & Library Resources

Summary of UofG / OMAFRA Equipment Inventories					
For Fiscal 2008/2009					
<u>Location Name</u>	<u>Opening Balance</u> (May 1, 2008)	<u>Adjustments to</u> <u>Opening Balance</u> <u>for items</u> <u>under \$10,000</u>	<u>Acquisitions</u> (during 08/09)	<u>Dispositions</u> (during 08/09)	<u>Ending Balance</u> (April 30, 2009)
Summary (totals of detailed data, below)					
All OMAFRA Program locations	49,130,337	10,791,506	2,733,105	540,563	40,531,373
Individual Locations					
Alfred Campus	1,846,789	857,505	0	0	989,284
Alma Aquaculture	968,675	544,010	0	0	424,665
Arkell Equine	36,100	22,100	0	0	14,000
Arkell Feedmill	833,200	1,200	0	0	832,000
Arkell Poultry	677,573	35,573	45,255	0	687,255
Arkell Swine	319,700	4,700	0	0	315,000
Elora Beef	1,557,119	292,209	110,000	7,800	1,367,110
Elora Dairy	1,093,300	288,800	38,000	85,000	757,500
Elora Plant Ag.	2,029,475	18,000	360,000	0	2,371,475
Emo	80,500	10,500	0	0	70,000
Guelph RSO	3,043,132	507,657	242,073	234,000	2,543,548
Guelph Turfgrass	145,513	74,252	0	0	71,261
Isolation Unit	12,600	12,600	0	0	0
Kemptville Campus	1,746,566	1,066,289	0	114,480	565,797
Bradford Muck Stn	268,189	146,189	0	0	122,000
NLARS	946,234	230,839	68,000	0	783,395
Plant Ag. Dr. Mohanty	0	0	704,018	0	704,018
Ponsonby Dairy	423,630	118,630	0	0	305,000
PGAF	151,494	86,494	0	0	65,000
Ponsonby Sheep	143,470	102,470	0	0	41,000
Ridgetown Campus	5,373,631	2,355,072	329,626	19,039	3,329,145
Simcoe	625,900	160,200	60,000	0	525,700
Thunder Bay	78,500	15,500	0	0	63,000
Woodstock	524,520	147,220	57,986	35,300	399,986
Vineland	2,286,536	437,436	20,000	10,600	1,858,500
Lab Services	23,917,991	3,256,061	698,147	34,344	21,325,733

Library Resources	
<u>Location</u>	<u>Replacement Value \$</u> <u>('000)</u>
Alfred	796
Kemptville	1,163
Ridgetown	1,244

Proof of Principle Program

OMAFRA's Proof-of-Principle (POP) Granting Program directed toward University inventions that fall within OMAFRA's research objectives was successful in strengthening the commercial potential of two technologies;

- i) High rosmarinic acid products originating from mint, and
- ii) Genetic markers used to reduce boar taint through breeding.

Mint

Selective breeding of *Mentha spicata* clones at the University of Guelph has generated plants with levels of rosmarinic acid 20 times higher than wild type mint. Rosmarinic acid has known anti-inflammatory, anti-oxidant, anti-viral and anti-bacterial properties. OMAFRA's \$18.5K assistance from a POP grant is being used to complete *in vitro* experiments on the anti-inflammatory potential of extracts from these cloned plants by monitoring changes in inflammatory biomarkers. In addition, \$24K was secured from an Ontario Ministry of Research and Innovation (MRI) C4 POP grant to conduct preliminary *in vivo* trials in horses at the Ontario Veterinary College to assess toxicity and efficacy in reducing arthritic progression. If successful, these trials will significantly increase the commercial potential of high rosmarinic acid mint as a functional food and veterinary therapeutic. The BDO has secured a PCT patent application for this technology and the plant variety is protected as well.

Biomarkers for Boar Taint

Genetic markers in boars that express very low levels of androstenone and skatole that cause boar taint, can be used in selective breeding programs to eliminate the need to castrate boars and raise faster growing, more profitable intact animals for pork. These genetic markers require additional validation and development in an industrial herd to demonstrate their potential and inclusion into a breeding program. OMAFRA's \$24K assistance has been leveraged with \$25K from the Ontario MRI C4 POP grant to complete genotyping and evaluation of these and additional biomarkers in 1300 pigs. Once completed this data should attract additional investment and interest from industry. Applications to secure more than \$100K for continued development and optimization of this technology for use in industry were made during fiscal 2008/09 to the Ontario Genomic Institute (OGI) in partnership with JSR Genetics UK, a leading pig genetics company, which has committed more than \$130K to the program and an equal amount of in-kind support. Support from both OGI and JSR was confirmed in the summer of 2009. The BDO also predicts that Genetiporc, a leading Canadian pig breeding company will join in the partnership in late 2009. Currently, the BDO has secured six patents (issued) with an additional 15 patent applications pending.

Agriculture and Food Laboratory – Schedule G

During the last quarter of the 2008/09 fiscal year, the AFL undertook a reorganization of its existing lab management structure which dated back to 1997. Four new laboratory units were created (Chemistry, Analytical Biology, Diagnostics, and Method Development) which better reflects the specific nature of the analytical services provided to clients including OMAFRA.

One laboratory operations manager has been assigned to each of these four service units, in part, to help provide a more detailed approach toward and active participation in working with OMAFRA staff to: accommodate requests for additional testing; develop detailed plans relating to surge capacity for emergency testing; and prepare and maintain business continuity plans related to the Agreement.

The timing of these changes unfortunately resulted in a delay around the institution of the Business Continuity Planning Committee required to accomplish the year one milestones. Now that the four lab managers have been identified as committee members, the current plan is for the Business Continuity Planning Committee to now move forward to: develop the HIRA for the AFL program, identify areas that may require emergency testing, and provide the Essential Level Continuity Plan all in year two.

APPENDIX A

SPARK Research Stories with OMAFRA Sponsorship 2008/09

Research news articles can be accessed from:

<http://www.uoguelph.ca/research/publications/index.shtml>

General information on the University's research communications can be found at

www.uoguelph.ca/research/communications/index.shtml.

In Print

The University of Guelph

Research magazine – fall 2008 issue

Towards better breathing – protein discovery could help fight asthma

Researcher: Dorothee Bienzle, Dept. of Pathobiology

Asthma vaccine on the horizon

Researcher: Laurent Viel, Dept. of Clinical Studies

When cells don't talk – miscommunication could cause early pregnancy loss

Researchers: Keith Betteridge, Dept. of Biomedical Sciences and Tony Hayes, Dept. of Pathobiology

Treating the off beat – Researchers develop new treatment options for longstanding atrial fibrillation

Researchers: Kim McGurrin, Dept. of Clinical Studies and Peter Physick-Sheard, Dept. of Population Medicine

Hobble by wobble – problems with spinal ataxia

Researcher: Stephanie Nykamp, Dept. of Clinical Studies

Faster with more pasture

Researcher: Suzanne Millman, Dept. of Population Medicine

Healthier horse feed – eliminating mycotoxins

Researchers: Trevor Smith, Dept. of Animal and Poultry Science and Susan Raymond, Equine Guelph

The fight against parasites – researcher stresses more monitoring as key to good horse health

Researcher: Andrew Peregrine, Dept. of Pathobiology

The University of Guelph

Research magazine – spring 2009 issue

Water friendly farming – which tillage practices limit transpiration and evaporation

Researcher: John Warland, Dept. of Land Resource Science

Preventing groundwater contamination from the utilization of sheep manure as fertilizer
Researcher: Michael Goss, Director of Kemptville Campus

Waste-water treatment – Guelph microbiologists improve water treatment by better understanding bacteria's physical-chemical interactions
Researcher: Steven Liss, Associate Vice-President (Research Services)

The local water movement – creating Ontario-specific models will better protect the province's water sources
Researchers: Ramesh Rudra and Bahram Gharabaghi, School of Engineering

Small farms need environmental management support
Researcher: Glen Filson, School of Environmental Design and Rural Development

A community approach to water conservation
Researcher: John FitzGibbon, School of Environmental Design and Rural Development

Shades of grey – using reclaimed water for irrigation
Researcher: Katerina Jordan, Dept. of Plant Agriculture

Detecting a deadly water-borne disease – cryptosporidiosis
Researchers: Jack Trevors and Hung Lee, Dept. of Environmental Biology

No-hassle nutrient vessel – managing water as a just-in-time nutrient delivery system for cattle
Researcher: Vern Osborne, Dept. of Animal and Poultry Science

The Advanced Food and Materials Network **Advance magazine – winter 2008 issue**

New research panel reveals views and consumption patterns of functional foods
Researchers: John Cranfield and Spencer Henson, Dept. of Food, Agriculture and Resource Economics

The Dairy Farmers of Ontario **Ontario Milk Producer magazine**

Calming hungry calves
Researcher: Ken Leslie, Dept. of Population Medicine
June 2008 issue

Genetic analysis of dairy calf health
Researcher: Ken Leslie, Dept. of Population Medicine
December 2008 issue

Managing organic production conversion
Researcher: Jim Fisher
January 2009 issue

Safe practice for de-horning dairy cattle
Researcher: Todd Duffield
April 2009 issue

The Ontario Cattleman's Association
Ontario Beef magazine

New technology for measuring feed efficiency

Researcher: Steven Miller, Dept. of Animal and Poultry Science
February 2009 issue

The Ontario Dairy Farmer magazine

Monesin depressing milk fat content

Researcher: Brian McBride, Dept. of Animal and Poultry Science
August/September 2008 issue

Hoof health

Researcher: Ken Leslie, Dept. of Population Medicine
April/May 2009 issue

The Ontario Beef Farmer magazine

Cows' eye whites correlate with their temperament

Researcher: Steve Miller, Dept. of Animal and Poultry Science
May 2009 issue

The Ontario Hog Farmer magazine

Reducing Salmonella contamination

Researcher: Keith Warriner
May/June 2008 issue

Reducing Salmonella in market hogs

Researchers: Robert Friendship and Vahab Farzan, Dept. of Animal and Poultry Science
May/June 2009 issue

The Ontario Poultry Farmer magazine

New moulting technique for shedding feathers

Researcher: Gregoy Bedecarrats, Dept. of Animal and Poultry Science
Summer 2008 issue

The Ontario Wheat Board
Ontario Wheat magazine

SMART initiatives for increasing wheat performance in Ontario

Researcher: David Hooker, Ridgetown researcher
September 2008 issue

The Ontario Corn Producers
Ontario Corn magazine

Website for weed control

Researcher: Mike Cowbrough, OMAFRA specialist
January 2009 issue

Fertilizer calculator

Researcher: Greg Stewart, OMAFRA specialist
February 2009 issue

Controlling cutworm

Researcher: Tracey Baute, OMAFRA specialist
April 2009 issue

Weed pro data

Researcher: Mike Cowbrough, OMAFRA specialist
May/June 2009 issue

The Canadian Farm Business Management Council
CFBMC website

Rye matt for weed control

Researcher: Darren Robinson
Published on site February 2009

Poultry air-pollutants

Researcher: Bill Van Heyst
Published on site April 2009

The Guelph Mercury Daily newspaper
SPARKPlugs

Local stone fruits with more antioxidants

Researcher: Jay Subramanian, Vineland researcher
Published August 11th, 2008

New technology for measuring cattle feed efficiency

Researcher: Steven Miller, Dept. of Animal and Poultry Science
Published February 26th, 2009

Eye white percentage linked to cattle temperament

Researcher: Steven Miller, Dept. of Animal and Poultry Science
Published March 11th, 2009

Ayr Newspaper
Spring 2009 special edition

Protecting pigs and pork from salmonella

Researchers: Robert Friendship and Vahab Farzan, Dept. of Animal and Poultry Science
Published April 18th, 2009

Fuel-efficient livestock

Researchers: Steven Miller and Yuri Montanholi, Dept. of Animal and Poultry Science
Published April 18th, 2009

Pollutants take flight

Researcher: Bill Van Heyst, School of Engineering
Published April 18th, 2009

Predicting cows' behavior with eye white percentage

Researchers: Steven Miller and Sarah Core, Dept. of Animal and Poultry Science
Published April 18th, 2009

Rye mat for weed control

Researcher: Darren Robinson, Ridgetown
Published April 18th, 2009

Going organic with ease

Researcher: Jim Fisher, Kemptville
Published April 18th, 2009

MaRS Landing

The Satellite newsletter

(all content is provided through the partnership between the University of Guelph, MaRS Landing and the Ontario Ministry of Agriculture, Food and Rural Affairs under the Agricultural Policy Framework)

- Summer 2008 newsletter
- Fall 2008 newsletter
- Newsletter for Royal Agriculture Winter Fair
- Winter/Spring 2009 newsletter

Spark Air Radio Broadcasts

Probiotics in chicken feed for health and productivity

Researcher: Dr. Shayan Sharif
May 1, 2008

Free online program for growers who use pesticides

Researcher: Mike Cowbrough
May 8, 2008

Announcement of the University of Guelph - OMAFRA \$300-million partnership

Researcher: Alastair Summerlee
May 8, 2008

How diet can influence methane emissions from cows

Researcher: Brian McBride
May 15, 2008

Calf health research project
Researcher: Kim Waalderbos
November 13, 2008

Preventing Bovine Respiratory Disease with early vaccination procedures
Researcher: Claire Windeyer
November 20, 2008

Policy Education Program for agriculture
Researcher: Maury Bredahl
November 27, 2008

Crop-weed competition
Researcher: Eric Page
January 6, 2009

Adding value to farmers' crops
Researcher: Rene Van Acker
January 15, 2009

Detecting Salmonella in market hogs
Researcher: Vahab Farzan
January 22, 2009

North American Agri-food Market Integration Consortium (NAAMIC)
Researcher: Karl Mielke
January 29, 2009

Feed and fuel efficiency in cattle
Researchers: Steve Miller and Yuri Montaholi
February 5, 2009

Turning waste into bio-resources
Researcher: Anna Crolla
February 12, 2009

Linking genetics to calf health and survival
Researcher: Lynsay Henderson
February 18, 2009

Omega-3 eggs
Researcher: Bruce Holub
February 26, 2009

Healthy garden plants for horse safety
Researcher: Bob Wright
March 5, 2009

Understanding cattle disease, bacterial pneumonia and stress
Researcher: Jeff Caswell
March 12, 2009

Healthier dairy cattle for improved production

Researcher: Filippo Miglior

March 19, 2009

Alternative land use services

Researcher: Glenn Fox

March 26, 2009

Forest waste products for cattle feed

Researcher: Ira Mandell

April 24, 2009

Detecting Salmonella in poultry housing and production

Researcher: Michele Guerin

April 30, 2009

Spark Air Video Broadcasts

Asparagus research

Researcher: David Wolyn

July 6, 2009

Hazelnuts in Ontario

Researcher: Adam Dale

July 13, 2009

Winter survival in grapes

Researcher: John Zandstra

July 20, 2009

Solving Tarspot in maple trees

Researcher: Tom Hsiang

July 27, 2009

Reducing ammonia in poultry barns

Researcher: Steven Leeson

August 3, 2009

Controlling weeds without pesticides

Researchers: Katerina Jordan, Eric Lyons and Francois Tardiff

August 10, 2009

Nitrogen needs for wheat

Researcher: Dave Hooker

August 17, 2009

Controlling weeds in corn

Researcher: Clarence Swanton

August 24, 2009

Ethnic Vegetables

Researcher: Alan Mckeown

August 31, 2009

APPENDIX B

OMAFRA/UofG Audited Statement of Revenues and Expenses

UNIVERSITY of GUELPH

FINANCIAL SERVICES

September 29, 2009

Ms. Karen Chan
Assistant Deputy Minister
Research and Corporate Services Division
Ontario Ministry of Agriculture, Food and Rural Affairs
1 Stone Road, 2nd Floor NW
Guelph, Ontario N1G 4Y2

Dr. Kevin Hall
Vice President (Research)
University of Guelph
50 Stone Road East
Guelph, Ontario, N1G 2W1

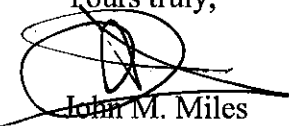
To the Executive Members of the OMAFRA-University of Guelph Agreement:

The annual audited financial statement of the research, education and laboratory services agreement with the University of Guelph for the 12-month period May 1, 2008 to April 30, 2009 is enclosed.

The report presents the financial statement for the fiscal year 2008/2009 as per Article 22.1.b of the master agreement, summarizing revenues and eligible expenditures by program.

If you have any questions or require any further information, please let me know.

Yours truly,



John M. Miles

Assistant Vice-President, Finance and Services

Email: jmiles@uoguelph.ca

Fax: (519) 836-3278

Enclosures

University of Guelph
Ministry of Agriculture, Food and Rural Affairs Agreement
Audited Statement of Revenues and Expenses

For the fiscal year May 1, 2008 to April 30, 2009

September 28, 2009

Auditors' Report

To the Ontario Ministry of Agriculture, Food and Rural Affairs

We have audited the accompanying statement of revenue and expenses of the **University of Guelph** for the year ended April 30, 2009 with respect to the agreement between the University of Guelph and the Ontario Ministry of Agriculture, Food and Rural Affairs ("the Agreement"). This financial information is the responsibility of the management of the University. Our responsibility is to express an opinion on this financial information based on our audit.

We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial information is free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial information. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial information.

In our opinion, the statement of revenue and expenses presents fairly, in all material respects, the results of the program's operations for the year ended April 30, 2009 in accordance with the Agreement and note 2.

PricewaterhouseCoopers LLP

Chartered Accountants, Licensed Public Accountants

UNIVERSITY OF GUELPH
MINISTRY OF AGRICULTURE, FOOD AND RURAL AFFAIRS AGREEMENT
STATEMENT OF REVENUES AND EXPENSES
For the Year Ended April 30, 2009
(in thousands of dollars)

	OMAFRA Programs					Total OMAFRA 2009	Total OMAFRA 2008
	Research	Vet Clinical Education	Agri-food Laboratory	Animal Health Laboratory	Minor Capital Repairs		
Income							
Provincial	41,769	5,297	4,033	5,977	5,854	62,930	59,305
Tuition						-	3,180
Sales of Goods and Services	3,457		9,793	3,629		16,879	19,905
Investment Income	1,622					1,622	
Other	1,343		271	266	10	1,890	4,352
Total Income	48,191	5,297	14,097	9,872	5,864	83,321	86,742
Expenses							
Personnel Costs	20,447	1,806	8,701	7,094	49	38,097	43,754
Support for Faculty Costs	9,915	1,900				11,815	7,915
Operating	11,955	1,486	5,655	3,954	5,815	28,865	32,931
Internal Recoveries	(3,535)		(546)	(1,375)		(5,456)	(4,343)
Service Costs	9,409	105	287	199		10,000	6,485
Total Contract Expenses	48,191	5,297	14,097	9,872	5,864	83,321	86,742
Net Income (Expense)	-	-	-	-	-	-	-

¹ Included in the 2008 comparatives is the period April 2008 of the Agreement. See Note 6

UNIVERSITY OF GUELPH
ONTARIO MINISTRY OF AGRICULTURE, FOOD AND RURAL AFFAIRS AGREEMENT
NOTES TO THE FINANCIAL STATEMENTS
FOR THE TWELVE MONTHS ENDED APRIL 30, 2009
(in thousands of dollars)

1. AUTHORITY AND PURPOSE

The University of Guelph operates as a not-for-profit entity under the authority of the University of Guelph Act (1964). The University is a comprehensive, research intensive university offering a range of undergraduate and graduate programs. With the exception of academic governance, which is vested in the University's Senate, the University is governed by the Board of Governors. The University is a registered charity (#10816 1829 RR001) and is therefore exempt from income taxes under section 149 of the Income Tax Act.

In April 2008 a ten year agreement (the Agreement) was signed between the University and OMAFRA (Ontario Ministry of Agriculture, Food and Rural Affairs). This financial statement has been prepared under the terms of the Agreement which requires an audited financial statement of revenues and expenditures summarized by program. In addition to annual funding under the Agreement, a one time payment of \$56 million (referred to as New Initiative) was received in April 2008 which will be disbursed, with interest, over a five year period ending in 2013. The \$56 million one time payment while a significant component of funding for OMAFRA projects does not form part of the Agreement (refer to Note 5).

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES AND REPORTING PRACTICES

These financial statements have been prepared by management in accordance with generally accepted accounting principles, applied consistently within the framework of the accounting policies summarized below:

(a) Fund Accounting

The accounts of the University are maintained in accordance with the principles of fund accounting in order to observe the limitations and restrictions placed on the use of available resources. Under fund accounting, resources for various purposes are classified for accounting and reporting purposes into separate funds in accordance with specified activities or objectives.

(b) Recognition of Revenue

The University accounts for revenue in accordance with the deferral method whereby externally restricted contributions are recognized as revenue in the year in which the related expenses are incurred. Unspent revenue is deferred until the goods or services are provided.

Unrestricted revenue is recognized as revenue when received or receivable if the amount to be received can be reasonably estimated and collection is reasonably assured.

UNIVERSITY OF GUELPH
ONTARIO MINISTRY OF AGRICULTURE, FOOD AND RURAL AFFAIRS AGREEMENT
NOTES TO THE FINANCIAL STATEMENTS
FOR THE TWELVE MONTHS ENDED APRIL 30, 2009
(in thousands of dollars)

3. UNSPENT REVENUE

The Agreement provides revenue restricted for use in approved research and service programs. Funds that were received but unspent during the year will be recognized as revenue in future years as eligible expenses are incurred.

	<u>2009</u>	<u>2008</u>
Opening Balance	12,204	
Funds Received	59,100	14,775
Expenditure	<u>(56,683)</u>	<u>(2,571)</u>
Ending Balance	<u><u>14,621</u></u>	<u><u>12,204</u></u>

4. MINOR CAPITAL REPAIRS

The University operates facilities designated under the Agreement located across Ontario. These facilities are either owned by the Province or Agricultural Research Institute of Ontario (ARIO).

For ARIO owned properties, the cost of minor capital projects for facilities are funded through separate funds held by ARIO.

5. NEW INITIATIVE FUND

While not formally included as part of the Agreement a major one-time allocation of \$56 million was received in April 2008. The New Initiative funds are not included in the attached Statement of Revenue and Expenses.

The \$56 million will be utilized during a five year period starting May 2008 and ending April 2013. As of April 30, 2009, \$3,761 has been spent leaving a balance of \$52,239.

The expenditures were spent in the following OMAFRA programs:

Research	3,197
VCEP	222
Animal Health Lab	<u>342</u>
	<u><u>3,761</u></u>

UNIVERSITY OF GUELPH
ONTARIO MINISTRY OF AGRICULTURE, FOOD AND RURAL AFFAIRS AGREEMENT
NOTES TO THE FINANCIAL STATEMENTS
FOR THE TWELVE MONTHS ENDED APRIL 30, 2009
(in thousands of dollars)

6. COMPARATIVES

The effective start period of the Agreement is April 1, 2008. The following table represents the expenditures related to the new Agreement that were included in the 2008 comparative numbers (Statement of Revenues and Expenses) and reported in the University of Guelph's 2008 audited financial statements.

	April 1, 2008 – April 30, 2008					Total OMAFRA Apr-08
	Research	Vet Clinical Education	Agri-food Laboratory	Animal Health Laboratory	Minor Capital Repairs	
Income						
Provincial	3,494	951	1,674	821	683	7,623
Sales of Goods and Services	388		462	289		1,139
Other	912					912
Total Income	4,794	951	2,136	1,110	683	9,674
Expenses						
Personnel Costs	2,288	234	929	775		4,226
Support for Faculty Costs	543	117				660
Operating	2,130	595	1,231	450	683	5,089
Internal Recoveries	(678)		(38)	(125)		(841)
Service Costs	511	5	14	10		540
Total Contract Expenses	4,794	951	2,136	1,110	683	9,674
Net Income (Expense)	-	-	-	-	-	-