

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

AND

UNIVERSITY OF GUELPH

AGREEMENT

**CONSOLIDATED ANNUAL REPORT
2009/2010**

September 30, 2010

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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 second Annual Report under the current Agreement between the University of Guelph and OMAFRA, which was signed April 1st, 2008, for the period April 1, 2008 to March 31, 2018.

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 2009/10 fiscal year (May 1, 2009 – April 30, 2010). 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).

Governance

During negotiations for the current Agreement, OMAFRA and the UofG agreed that effective governance is important to achieve the objectives of the Agreement. An independent consultant reviewed governance from the previous Agreements and made recommendations for improvements, and a new, joint governance model was developed. This model is collaborative, accountable and transparent.

The structure is comprised of a series of committees; the Agreement Leadership Committee (ALC), is responsible for chief oversight of the Agreement; the Executive Committee (EC), is responsible for the parties working together effectively to ensure the Agreement is fully carried out; and four program management committees (PMC) as well as a Joint Intellectual Property (IP) committee, are responsible for delivery of program level responsibilities. The program management committees are: AFL, AHL, VCEP, and Research.

All committees operate under their own terms of reference, membership, and specific responsibilities. These responsibilities and requirements are outlined in the Master Agreement and in the Committees' respective schedules of the Agreement. These documents have been provided to committee members in a program management handbook. As well, all governance documents are posted on a password protected website created for UofG and OMAFRA staff who sit on these committees.

A partnership secretariat was also created to provide administrative oversight for successful partnership implementation. The secretariat works collaboratively with committee co-chairs to address responsibilities and ensure relevance of the performance indicators (PIs). This responsibility lies with OMAFRA, but UofG staff collaborates, where possible, to help ensure all targets and deadlines are met.

Overall Agreement

In the OMAFRA/UofG Agreement renewal, communications was identified as key to the initiative's success. This included outreach to the public, consumers, and internal communications to OMAFRA and UofG employees to help them understand the outcomes generated by the Agreement. Working with the private sector in getting new knowledge from the lab and into the field was seen as crucial, and numerous strategic communications activities were supported in 2009/10, dedicated to further nurturing and refining projects designed to enhance the understanding and value of the Partnership. These projects covered print and broadcast media, as well as internal and external communications.

In order to ensure accountability and direction for 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). In 2009/10 Research, AHL and VCEP put forward changes to PIs governing their program, to better reflect meaningful measurements of performance. These changes were approved by the Executive Committee and are reported on in this annual report in Appendix B.

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 2009/10 both programs continued to be developed and two KTT staff personnel were hired and a faculty Coordinator for the HQP program was announced. The HQP program had its first call for applicants in 2009/10 and 32 graduate students were accepted into the program. Further details on these new programs are provided in the New Initiatives section of this report.

Research

The Research Program has seven 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. Each research theme is lead by a Research Program Director (RPD) from the University of Guelph and a Director Champion (DC) from OMAFRA.

Highlights and case studies from each research theme follow later in this report. Achievements from the 2009/10 research program include a study on the farmers' perspective of Ontarians buying local food, growing and evaluating perennial grass biomass as alternative heat and power sources, developing a computer software to assist government in emergency planning, what's best for the environment – till or no-till, health value of edible beans, developing therapeutic antibodies in plants, enhancing poultry health and research into increased honey bee mortality.

A Call for Letters of Intent (LOIs) was issued in November, 2009 due in December, 2009. Over 200 LOIs were received – 70 of them applying across two or more themes. These LOIs were

reviewed by research theme committees, chaired by the Research Program Director 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 LOIs reviewed, 112 (22 applied across themes) full proposals were requested for submission, and 72 (11 across themes) were funded. They will be reported on in next year's annual report.

On September 1, 2009 Prof. Rich Moccia was appointed the AVP (Research) Agri-Food and Partnerships. Prof. Moccia had been serving in this role on an interim basis since May 2007.

Communication efforts have continued to grow. In 2008/09, an Agri-Food Yearbook was developed as a special edition of the University of Guelph's long-established Research magazine. Based on its enthusiastic reception, in 2009/10, the yearbook became a regular part of the Research magazine's annual publication schedule. Its focus for 2009/10 is sustainability.

The Buzz is an electronic newsletter about the Partnership. Launched in 2008, during 2009/10 the format was enhanced by adding photos and including a broader collection of contributors. As well as news about research, research stations and events, each issue now also includes regular contributions from the Business Development Office (BDO) and the KTT program.

Similarly, News@Noon, the noon hour speaker series which features programs and research about the Partnership, is now reaching a broader audience. Invitations to the events have been extended to industry and it is now also being offered 'live' over the internet for people who can't attend in person.

Outreach efforts are documented in Appendix A, but at least one deserves special attention. A news story about OMAFRA-supported research into bee losses made headlines in early March, 2010. The University pitched a news release about Prof. Ernesto Guzman's discoveries about the causes of recent, devastating bee colony losses. The news release was picked up by Canadian Press and ran in various newspapers and online news services. As well, the Discovery Channel traveled to Guelph to interview Prof. Guzman for a story on its show *Daily Planet*. Prof. Guzman's News@Noon talk was also filmed and is featured in that story, called "Unwrapping bees." It aired in April, 2010.

Partnership research had continuing support from the Students Promoting Awareness of Research Knowledge (SPARK) program, of the UofG, through print and broadcast stories. SPARK*AIR continued to travel to many research stations to promote Partnership research across the province and videos were again posted on Farms.com. Starting in February, 2010, these stories also began airing on the Rogers Television, Guelph show *First Local*.

Owen Roberts, Director of Research Communications, continued his secondment in the Office of Research to help deliver a communications plan approved by the Executive Committee during the 2009/10 year. Prof. Roberts completed his Doctorate of Education with his dissertation titled "A model for student learning in knowledge translation and transfer in Ontario" based on the University's SPARK program.

Commercialization and licensing of research outcomes from the OMAFRA/UofG Agreement is reported by the Business Development Office. For 2009/10 they report 121 disclosures, 10 patents filed, 20 licenses granted and zero patents issued – with total license revenue for OMAFRA supported research of \$1,083,227. The Technology Transfer Manager dedicated to

the Agreement has spent a full year doing outreach to those funded under the Agreement and is building good relationships that are expected to lead to improved outcomes.

The BDO is further taking measures to increase outreach to Ontario companies through the initiation of the Industry Liaison Program, which started in January 2010. This program is designed to facilitate interaction between companies and researchers to increase sponsored research. In another significant staffing development, Erin Skimson was appointed as the full time Director of the BDO effective May 2010. Erin brings significant experience in organizational leadership to the role.

One new project was funded through the Proof-of-Principle program, related to a tomato trait useful to processors.

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 continued full accreditation from the AVMA/CVMA.

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 new graduates.

The Bovine Education Trust was established to provide financial support for veterinary students to obtain further on-the-job training in the dairy and beef industries. Start-up funding for the trust was provided by the Partnership, through the VCEP program.

The Centre for Public Health and Zoonoses (CPHAZ) finalized plans for renovation of the space being vacated by the Pathobiology Department and the AHL when they move to their new building. This will provide much needed space for the various faculty associated with the centre.

In 2009/10 the Masters in Public Health (MPH) enrolled its second class of 15 students in the fall of 2009, and graduated the first class in the spring of 2010.

Laboratory Services

Laboratory Services continues to optimize the leveraging of services offered within the Partnership Agreement to other government, commercial and academic clients while developing new areas of service to maintain its status as a self-sustaining division of the University of Guelph. The Animal Health Laboratory (AHL) and the Agriculture and Food Laboratory (AFL) report separately in the annual report under the new Agreement.

Policy

- The strategic Vision and Mission were reaffirmed for Lab Services Division in 2009/10 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.

Agriculture and Food Laboratory

The AFL has been working this past year towards building on a foundation of strong business processes and marketing activities that will assist in growing the current client base and securing new business opportunities. As always, the goal is to continue to build external revenues for reinvestment (per Schedule "F" of the Agreement).

The AFL continues to offer a high level of service to clients in agriculture, food and beverage, corporate and research sectors. In 2009/10 the AFL implemented several new and renewed initiatives:

1. Developed a new multiple residue (multi-residue) methodology, approved under the terms of the Ontario Milk Act, Regulation 761 as the Official Method for sulfonamide and tetracycline drug residues.
2. Continued to provide valuable support to the Plum Pox Virus eradication program.
3. Finalized a multi-year contract with the Dairy Farmers of Ontario and the Ontario Dairy Council for the continued delivery of composition and quality testing of the Ontario bovine milk producers by increasing sample numbers to over 800,000 samples in the first year.
4. Instituted a focused and targeted communication strategy, internally and with OMAFRA, toward continuous improvement in the delivery of AFL services to the Ministry.

Animal Health Laboratory

Significant progress was made on the new Pathobiology-Animal Health Lab on Gordon Street, and occupancy is set for October, 2010.

The AHL Animal Health Strategic Investment (AHSI), new initiative funding, continued to support 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. As well, AHSI provided funding for the purchase of new testing equipment needed by AHL.

Yearly the AHL surveys its clients to determine their satisfaction, by commodity, with key parameters of AHL service (as described in performance indicators #4, 7 and 9). In 2009/10 OMAFRA provided new input to the survey questions, and the mailing list was expanded to over 400 clients, both large and small. Survey results showed very high client satisfaction in all categories, and identified several areas where further improvement could be made.

The annual update to the American Association of Veterinary Laboratory Diagnosticians (AAVLD) resulted in continued accreditation within the five-year accreditation granted in April 2009.

Program Highlights and Case Studies

Agriculture and Food Laboratory

New Multiple Residue Methodology for Veterinary Drugs

Continued development of this method has seen gains over the past year.

Two multi- residue methods were successfully validated for use after just twelve weeks of development.

OMAFRA requested that the Method Development team, led by Dr. Perry Martos, develop multi-residue technology to deliver rapid and accurate identification and quantitation of sulfonamide and tetracycline drug residues in a new matrix, raw milk samples. Using the gains in knowledge and experience from the development and expansion of the multi-residue methodology in meat, the laboratory was able to interject this urgent request from OMAFRA received in the fall of 2009.

Successful Validation of over 30 drug compounds tested simultaneously

This multi-residue method in meat, allows for over 30 drug compounds to be detected and identified in a sample simultaneously, and has now been successfully validated for quantitative results. This method will be fully implemented in two meat safety testing programs for OMAFRA in August 2010.

Virtual Elimination of false positive results

The success of this method is the virtual elimination of false positive results in a drug residue method(s) for animal tissues, and it allows for rapid response by regulators to the identification of violative levels of drug residues in the Ontario meat industry.

Upholds OMAFRA and AFL as National Leaders

This new methodology positions OMAFRA and the AFL as national leaders in the multi-residue detection field for veterinary drugs. Development of this method and similar applications will continue through 2010-2011.

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. Publication of this method in the Journal of Agriculture and Food Chemistry as well as ongoing presentations and discussions at various scientific meetings and with the CFIA and the USDA demonstrate early acceptance and the validity of this analytical approach in North America.

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, Agricornp, 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 a significant advantage to the Ministry and private clients. 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 736,000 samples during a 16-week period during the spring/summer of 2009. 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 maintain the level of a six sigma quality standard – or less than 3.4 errors per one million tests performed – for four consecutive years. With over four million samples now having been processed, the multiple achievement of this six sigma standard speaks to the very rigorous quality system that is in place.

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. The on-going testing and eradication efforts have resulted in a significant decrease in the number of positive samples, down to 261 in 2007, 131 in 2008 and only 88 in 2009. This is clear evidence of the value of the professional efforts put forth by AFL staff and continued commitment by OMAFRA to support the program.

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 2009, the AFL worked closely with the University's Office of Legal Counsel to negotiate a written contract with the Dairy Farmers of Ontario and the Ontario Dairy Council for the continued delivery of milk composition and quality testing within the province. The agreement was signed by all parties in early June 2010.

As of June 1, 2010 every sample of raw milk taken from each bulk tank is now being tested for compositional analysis. This will result in an average of over 800,000 samples tested each year. The AFL made a significant purchase (\$2.5 million) of new instrumentation in order to meet the increase sample throughput required in the new contract. Extensive quality assurance has been performed to demonstrate that the new equipment meets the manufacturer specifications and all proficiency testing trials have passed to date.

The dairy testing system is a collective effort between OMAFRA, DFO, ODC and the University of Guelph's AFL for the continuous improvement of Ontario's Raw Milk Quality Program and sustainability of the dairy industry.

Communication Strategy

A formal communication policy was implemented at the AFL (Spring 2010) toward management of information flow and improved clarity in communications between the laboratory and our OMAFRA counterparts.

A single point of communication was established, while still encouraging open dialogue between OMAFRA and the AFL's scientific staff. The OMAFRA Coordinator of the Agriculture & Food Laboratory Program (Food Safety Science Unit) is the communication conduit from the Ministry in parallel to the AFL Manager of Client Programs.

The implementation of biweekly routine internal meetings provides regular updates at the management team level of current affairs surrounding the contract. OMAFRA and AFL continue to demonstrate a strong commitment to the quality delivery of the Partnership Agreement through coordination of efforts and expertise.

Information exchange events have been initiated by the AFL and OMAFRA whereby ministry and laboratory staff meet to discuss topical issues and share information. Three to four such meetings are to be held each year. This interaction is a valuable tool in keeping abreast of emerging food safety and agricultural information, sustaining the positive relationship, and discussing new technologies.

An Agricultural Advisory Group has been formed with a focus on agricultural services provided by the laboratory. Information gathered from this group will be put toward the development of a strategy to allow the AFL to best serve the needs of this sector. This approach will be used with other industry sectors for seeking feedback from stakeholders.

Leverage Laboratory Capacity for Reinvestment

Laboratory Services continues to modify and improve 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.

In addition to a new marketing director, several initiatives were implemented to improve upon current business processes that will support the necessary growth of the AFL.

The Marketing and Sales Unit has taken on several initiatives that will contribute to the ongoing success of the division:

- The development of account management practices that provide a more detailed focus into each of the lab section business successes and challenges.
- An ongoing comprehensive market research study that will incorporate client surveys and focus groups.
- An exercise to examine current and potential branding activities specific to the AFL.
- Activities to raise awareness in current and potential clients as to the scope and depth of AFL services, e.g. newsletters, tradeshow, seminar series.

Case Study

Expanding Residue Testing in Bovine Milk

In fall 2009 OMAFRA was met with the unanticipated requirement for the development, validation and use of new test methods using LC-MS/MS (Liquid Chromatography-Mass Spectrometer/Mass Spectrometer) technology for the identification and quantitation of tetracycline and sulfonamide compounds in raw milk. They altered its Method Development Master Schedule and realigned resources to an estimated six to eight weeks to develop a method for each drug class. Each method must be able to identify and quantitate several drug compounds within each of the two drug classes, sulfonamides and tetracyclines. Each method was developed and validated in the matrix and for a range of detection based around regulatory limits (MRL - Maximum Residue Limit).

This process typically requires 8 to 12 weeks per compound class and matrix. The laboratory successfully completed development of quantitative methods based on the use of LC-MS/MS technology for both compound classes in twelve weeks from the time of request.

Animal Health Laboratory

Infrastructure

- Significant progress was made in 2009/10 on the new building on Gordon St. that will house the AHL and the OVC Department of Pathobiology (Pathobiology – Animal Health Laboratory Building, building 89). The project is on schedule and on budget. Occupancy is targeted for October 2010. The tender for an alkaline tissue digester to provide on-site disposal of animal anatomical waste for the necropsy suite is on hold.
- Significant new testing equipment was added to the inventory of the AHL, through funding from the Animal Health Strategic Investment (AHSI) (~\$1.2M) and from the Canadian Food Inspection Agency (CFIA) (~\$100K).

Operations

- AHL continued to offer a wide spectrum of tests, with addition/replacement of improved tests over time as enhanced through the AHSI, e.g., real-time Polymerase Chain Reaction (PCR) to replace gel-based PCR tests. The following is a list of new tests offered by the AHL in 2009/10:

Test Name
Chlamydia sp PCR
Chlamydia rt PCR
Chlamydophila.psittaci RT PCR
Mycoplasma ID by FAT
APP PCR
Avian bornavirus PCR
Bluetongue virus -real-time RT-PCR
Selenium – serum, ICP-MS
Fowl adenovirus 08/FAdV11 MNT (cell culture application)
C reactive protein
Serum amyloid A
PRRSV NA EU PCR NG Ti
PRRSV ORF5 GLY
PRRSV IDEXX X3
PRRSV NA EU PCR NG
Coxiella burnetii ELISA
CAEV ELISA VMRD
Respiratory syncytial virus RT-PCR
Swine influenza virus, MultiS-Screen- antibody ELISA

- The AHL performed approximately 53,682 cases and 693,500 procedures in support of disease surveillance.
- The annual AHL client satisfaction survey was conducted electronically this year, via LimeSurvey, with input on questions from OMAFRA, and results demonstrated an overall satisfaction rating of 97.9%.
- The AHL published approximately 50 articles in the AHL quarterly newsletters in 2009/10. As well, AHL veterinarians were involved in 14 oral or poster presentations and 22 peer-reviewed publications in calendar year 2009.

- The AHL informed OMAFRA of 72 reportable or notifiable disease events that were suspected and /or confirmed by the AHL in Ontario in 2009/10, ranging from Eastern equine encephalitis through swine influenza and salmonellosis, and participated in the subsequent investigation of these outbreaks. The AHL also forwarded samples from 111 cases to CFIA laboratories for rule-out of reportable diseases, primarily rabies, but also including classical swine fever, BSE, and other diseases.
- 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. The annual update provided in January 2010 was acceptable to the Accreditation Committee.
- The Animal Health Strategic Investment (\$1.5M/yr for 5 yrs) has funded 28 projects targeted to support the three 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.
 For details of new initiatives see pages 127-129.
- The AHL participated in steering committee meetings beginning in December, 2009, for a planned poultry disease simulation exercise led by the Feather Board Command Center (FBCC), and contracted to eBiz professionals, with the exercise to be conducted in June 2010.

Research

Agricultural and Rural Policy

The OMAFRA/University of Guelph Partnership supports research in this theme in order that government can provide support to Ontario's agri-food 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 provides up-to-date, factual information on which to base sound policy decision.

Highlights from the program this year include:

- Researchers in the School of Environmental Design and Rural Development are heading a new research program to help struggling rural municipalities cope with economic decline. The team plans to develop a "how to" manual to identify and explain best practices for municipalities as well as highlight success stories of other rural areas and provide approaches to improve local conditions. (Caldwell, #200051/26695)
- Researchers and graduate students from the Department of Food, Agricultural and Resource Economics are finding out how to use lessons learned from the Norfolk County Alternative Land Use Services (ALUS) pilot project -- a project encouraging farmers to offer

environmental goods and services like wildlife habitat, scenic amenities and outdoor recreation opportunities, in addition to the traditional agricultural commodities they produce on their lands -- to take it province-wide. Along with a GIS analysis which shows which private rural lands in Ontario are currently providing these services, the team talked to farmers who both did, and did not participate in the ALUS project. With that knowledge they have developed principles and policies to help farmers and all Ontarians further benefit from our rural landscapes. (Fox, #026594)

- As cities in Ontario become increasingly multi-cultural, markets for culturally appropriate foods are set to increase exponentially. New Canadians, who aspire to farm in Ontario, bring a wealth of knowledge of sustainable farming methods and food crops that can cater to ethno- cultural communities in Ontario. Researchers in the Department of Geography, working with the Guelph-based farm organization, FarmStart and community collaborators, have found that these potential farmers face many barriers which include access to land and credit, limited knowledge of climatic and other environmental constraints, and co-ordination of food marketing. However, with the support and participation of public sector and non-governmental bodies and community partners, urban-centred opportunities for training and engagement are possible and now becoming more visible. (Smithers, #026519)

Case Study

John Devlin, School of Environmental Design & Rural Development

#200050/26692: Local Food Initiatives in Ontario from the Farmer's Perspective

September 1, 2009 – September 30, 2011

(up to and including 09/10)

OMAFRA / UofG Research Project Operating	\$20,040
Faculty/CARG FTE	\$22,463
Research Station Use	\$0
Tech/Admin Support and Indirect Costs	\$4,840
Total OMAFRA / UofG Project Value (up to and including 09/10)	\$47,343
Partner/In Kind Contributions	\$0
Collaborators	Landman, K. UofG – School of Environmental Design and Rural Development

Despite economic trends towards increasing globalization, a growing legion of consumers say they're committed to local food and sustainability. The bulk of the discussion is coming from urban dwellers. But how do farmers feel about all this?

Profs. John Devlin and Karen Landman and graduate student Meredith Davis from the University of Guelph School of Environmental Design and Rural Development have embarked on a research study to better understand how farmers perceive the growing local food movement and their involvement in it.

"Most of the research will take place sitting down with farmers, right at their kitchen tables," says Davis, who was responsible for conducting interviews with 27 farmers from 21 farms in the Waterloo region this past winter and spring.

She questioned farmers on their motivation to participate in the movement, as well as challenges they have faced. Farmers were also asked for their opinion on what programs or policies should be implemented in the future, to better support the local food movement.

Davis found that farmers are involved in the local food movement in a number of unique and novel ways, including direct on-farm selling, and participating in farmers' markets and food box programs. Some participants have started selling seasonal cookbooks, or offering on-farm cooking lessons to reintroduce the lost food skills needed for preparing healthy, fresh, non-processed meals from locally grown food.

"By selling directly, the farmers are more in tune to exactly what the customer wants. Additionally there is a certain level of trust built between the farmer and the customer – the customer may be able to directly observe how the food is being grown," says Davis.

The farmers came from a number of different agricultural sectors, and also differed with respect to the type of local food initiatives in which they were involved.

Besides the Waterloo area study, researchers will also survey farmers in Prince Edward County and the Sudbury area beginning in the fall of this year. These three distinct agricultural production areas were chosen for their unique geographic characteristics as well as marked differences in the urban-rural divide. These regions also already have a history of being celebrated for their unique initiatives within the local food movement.

The two-year project will finish next spring. Ideally, Devlin would like to expand the project to include all five agricultural census regions in Ontario, to better understand local food activities occurring across the province.

He adds that many farmers participating in the local food movement see it as a promising strategy for preserving the viability of the farm and rural communities. But there are challenges, and a lot of work needs to be done to expand the market and to make it easier for farmers to supply.

Bioeconomy – Industrial Uses

Plant and animal products in agriculture have long been used primarily 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:

- The 2010 Ford Flex has interior parts made from wheat straw-reinforced plastic, using technology that was created as part of the Ontario BioCar Initiative involving scientists at Guelph and the universities of Toronto, Waterloo and Windsor. (Erickson, #26259)
- Researchers in Food, Agricultural and Resource Economics are helping policy makers — and ultimately growers — navigate the new green economy by modeling the impacts of a projected increase in demand for corn and soybean crops related to a push for bioproducts. (Weersink, #26547)
- Plant Agriculture researchers are developing environmentally friendly industrial fibres from conventional crops such as corn and soybeans to include in composite materials for auto parts manufacturing, as well as protein isolates from wheat, soybean and dry beans for manufacturing food packaging, paper coatings and bandaging materials. (Pauls, #26384)

Case Study

Bill Deen, Plant Agriculture

#200094/26743: Evaluation of perennial grass biomass systems in Ontario

(Also in Production Systems)

June 15, 2009 – March 31, 2012

(up to and including 09/10)

OMAFRA / UofG Research Project Operating	\$113,425 for 09/10 and \$360,009 for whole project Note: some of this funding was from Prod Systems Plant.
Faculty/CARG FTE	\$80,542
Research Station Use	Elora Crop Science \$7,700, Simcoe \$5,198, New Liskeard \$621, Emo \$621, Ridgetown \$ 2,250, Kemptville \$1,500
Tech/Admin Support and Indirect Costs	\$103,438
Total OMAFRA / UofG Project Value (up to and including 09/10)	\$315,295
Partner/In Kind Contributions	\$364,413 for 09/10 and \$783,063 for whole project

Collaborators	McKeown, A. , UofG- Plant Agriculture, O'Sullivan, J. , UofG – Plant Agriculture, Van Acker, R. , UofG- Plant Agriculture, Rowell, J. , UofG- New Liskeard Agriculture Research Station, Young, D. , UofG – Ridgetown Campus, Tubeileh, A. , UofG-Kemptville Campus, Rennie, T. , UofG – Kemptville Campus, Todd, J. , OMAFRA, Banks, S., OMAFRA, Gartshore, M. , Pterophylla, Walsingham
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Biofuels are expected to grow in popularity with the ever-increasing awareness of our impact on the environment, leading farmers and power generation industries to look at the amount and type of crops they can grow for biofuel production.

Prof. Bill Deen and his team are researching the potential for growing perennial grass crops as biomass to meet the emerging demands for alternative heat and power. To do that they are growing a wide variety of C4 grasses like *switchgrass*, *miscanthus*, *big blue stem*, *prairie cord* grass and multiple native, adapted grasses. Grass biomass is not only efficient as an energy source, but carbon neutral -- the carbon released during combustion is equivalent, if not lower, to the amount of carbon the plants absorb through photosynthesis.

And there are a lot more reasons to look at perennial grasses in this light – using them this way can potentially solve several problems at once. The government has made a commitment to phase out coal and this can help -- also keeping a sizeable amount of electricity generation in the area without having to build new transmission lines or plants. There is the possibility to help keep and create more local jobs. As well, perennial grasses can potentially be grown in marginal soil so could provide producers, particularly in Northern regions and on the tobacco sands along Lake Erie, an alternative crop option.

To test all of these things, Deen and his team are growing grasses in a variety of soil types, using different management systems, at multiple sites across the province. This will help them determine which grasses have higher yields, better energy efficiency when burned and which can offer a better profit to producers.

These plots are being established at key ARIO research stations for multiple uses and benefits: to generate available biomass to evaluate for bioenergy or bioproducts, the plots can be used by other researchers for greenhouse gas measurements; they will act as demonstration sites for interested producers and industries and will offer valuable training opportunities for students. One year into the project; Deen and his team have found that *miscanthus* varieties differ in winter hardiness. The varieties *nagara* and *amuri* have excellent winter tolerance. Winter hardy varieties of *miscanthus* and *switchgrass* produced high yield at the Elora Research Station site and yield was increased with application of nitrogen fertilizer. Plots have also been established at a research station located near Ridgetown and also at Simcoe, Kemptville, and New Liskeard.

Perennial grass biomass is well suited to meet the emerging demands for alternative heat and power by industries such as Ontario Power Generation Inc. (OPG), Ontario Greenhouse industry and Lafarge Cement. Ontario Power Generation Inc. is already exploring the option of producing power from biomass in order to reduce the environmental footprint from burning coal at its electricity generating plants. Coal burning is scheduled to be discontinued by OPG at the end of 2014. Alternative heat and power sources could also benefit the livestock industry, and

rural residents, and could position Ontario's farmers to profit from growing the grasses. Research on perennial grasses will provide critical data, demonstration sites, and training to support this emerging industry.

Emergency Management

The goal of Emergency Management research under the OMAFRA/UofG Partnership is to provide a proactive, co-ordinated 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:

- Researchers in the Department of Food Science are developing quick and cost-effective on-site diagnostic tools to facilitate rapid containment and corrective action in a food contamination outbreak, as well as more efficient routine surveillance tools. (Warriner, #200018/26699)
- Researchers responding to the 2009 human novel H1N1 pandemic are establishing an influenza surveillance system for Ontario finisher pigs. By testing saliva samples from privately owned pigs, the team will assist producers in determining whether the novel H1N1 virus is in pigs, so public health officials can put the role of pigs in perspective. (Dewey, #200022/26736)
- Goat and sheep producers, researchers, producer organizations and OMAFRA are working together to identify research and information outreach needs around zoonotic diseases in the goat and sheep industries through a series of focus groups and a mail survey on the topic, facilitated by a researcher in the Department of Population Medicine. (Jones, #200021/26707)

Case Study

Deborah Stacey, Computing and Information Science

#200024/26693: Advancement of Poultry Disease Spread Modeling

August 1, 2009 – July 31, 2010

(up to and including 09/10)

OMAFRA / UofG Research Project Operating	\$35,000
Faculty/CARG FTE	\$14,975

Research Station Use	none
Tech/Admin Support and Indirect Costs	\$9,863
Total OMAFRA / UofG Project Value (up to and including 09/10)	\$59,838
Partner/In Kind Contributions	\$15,000
Collaborators	Klotz, G. , UofG – adjunct professor Department of Computing and Information Science

Tracking down the different ways disease can enter the food production system is not as clear cut as it may seem – especially when there are many steps along the way from farm gate to dinner plate. Speedy analysis would make a difference not only to animal and human health, but also to the environment and economy.

Prof. Deborah Stacey, Director of the School of Computer Science at the University of Guelph, is looking for a better way for administrators and researchers to plan for and respond to the spread of animal diseases, based on the numerous paths diseases can take.

And to her, the answer is the Shared Hierarchical Academic Research Computing Network (SHARCNET), a network of high-performance supercomputers linked across universities in southern Ontario.

Stacey and her research team are developing free, open-source software that can be modified to suit individual situations when problems arise. Their new software is designed using a “scale-free” network of “hubs” (instead of a random network) to simulate possible distributions of flocks along the food supply chain.

A hub might be a large chicken operation or meat processing plant that distributes poultry to several different supermarket chains. The idea is to illustrate the possible distribution paths poultry could take. In a simulated disease outbreak, epidemiologists can study the differences in disease spread that are caused by various distributions or contact networks.

The software also allows researchers to account for many variable elements, such as farm location, the method of transportation, and whether a related disease is airborne. All of these elements can either trigger or influence the spread of a disease.

Stacey says that being able to model the wide variety of possible paths a disease may take with the help of their new software program will allow government health agencies to study different scenarios and plan for an emergency.

The information will help determine the best course of action – quarantine, vaccination or culling an infected flock – and the possible effect on the plan’s effectiveness and economic viability.

“The models can’t predict where the infections are going to go, but we can help inform epidemiologists and ministry officials so that they can develop policies if there is an infection,” says Stacey.

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 at Alfred Campus are helping OMAFRA develop models and technology factsheets to help livestock producers turn manure into electricity with anaerobic digestion systems. To date the research has shown that digested manure can increase crop yields, and research continues on the implication of pathogen and nitrate migration in soils. (Crolla, #026577)
- As the demand for bioenergy increases, researchers in the School of Environmental Sciences are creating a tool to assess and manage potential environmental impacts. Once completed, this model will inform and assess bioenergy policies and provide direction for research. (Wagner-Riddle, #200013/26730 – also in Bioeconomy Industrial Uses Theme)
- The safe and economical management of animal manure in Ontario is a perennial issue for producers and their neighbours. In the School of Environmental Sciences, a team of researchers is looking at fly larvae as a solution. They've found that fly larvae effectively turn chicken manure into organic fertilizer in less than two weeks and might also be a good source of food for poultry and fish. (Zheng, #200057/26680 – also in Product Development and Enhancement through the Value Chain Theme)

Case Study

Jon Warland, School of Environmental Sciences

#026579: Environmental impact of crop residue removal under conventional and zero-tillage scenarios

April 1, 2008 – March 31, 2011

(up to and including 09/10)

OMAFRA / UofG Research Project Operating	\$100,000
Faculty/CARG FTE	\$262,307

Research Station Use	Elora Crop Science \$20,055 (Total fees \$21,000 less partner share paid of \$945)
Tech/Admin Support and Indirect Costs	\$237,993
Total OMAFRA / UofG Project Value (up to and including 09/10)	\$620,355
Partner/In Kind Contributions	\$48,000
Collaborators	Parkin, G. , UofG – School of Environmental Science, Wagner-Riddle, C. , UofG – School of Environmental Science, Dunfield, K. , UofG – School of Environmental Science, Berg, A. , UofG – Department of Geography, Duke, C., OMAFRA, Oelbermann, M. , University of Waterloo- Department of Environment and Resource Studies

It's not known how much biomass can be removed from the ground without degrading long-term soil health and productivity. But that information is important as the agri-food sector moves toward using biomass to produce ethanol.

Prof. Jon Warland, School of Environmental Sciences, and a team of researchers have been looking at how different agricultural management techniques affect soil water, nitrogen and greenhouse gas emissions (GHG). They are comparing conventional tillage, turning over the soil with a plough, and no-till, where the roots and lower portion of plant stalks are left in the ground to see if using biomass for novel products is environmentally sustainable.

Removal of crop residues impacts soil water because reduced organic matter levels affect soil structure. Water lost through evapotranspiration -- a combination of plant transpiration and evaporation from the land's surface occurs naturally to a certain extent, but it's exacerbated by such things as land use – especially tillage, which disturbs the soil, and can have an effect on the normal growth of future crops.

Over the last decade the team has found that combinations of “best management practices”, such as reduced tillage and soil test-based fertilizer applications, have reduced emissions of the powerful greenhouse gas nitrous oxide (N₂O). A significant part of this project is determining the impact of residue removal on greenhouse gas emissions, as potential changes to water level changes may exacerbate N₂O production in the soil.

To get an even better picture of the differences between till and no-till practices, the team developed algorithms to analyze data received from RADARSAT2 – a satellite run by the Canadian Space Agency (CSA) and MacDonald Dettwiler and Associates Ltd. (MDA). Using these radar images, calibrated against their own field data, Warland and his team can assess how much land in Ontario is under different management practices and how those practices are affecting soil health.

These data sources are integral to the Ontario agri-food sector, looking to create more environmentally-friendly products, but doing so in an environmentally sustainable way.

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. It also provides competitive opportunities for producers and agri-food companies. The OMAFRA/UofG Partnership is committed to supporting research to provide consumers with functional foods — foods that have been shown to have health benefits, such as reducing heart disease and the incidence of diabetes. 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:

- Consuming whole-grain foods made from red wheat currently means sacrificing flavour for the sake of health benefits. The culprits are the astringent and bitter notes inherent in red wheat. Researchers are looking at how people react to these traits to help find a balance between health and taste in future whole-grain products. (Duizer, #26717/200064 – also in Product Development Theme)
- Increased consumption of berry fruits has been associated with health benefits, including the prevention of chronic degenerative conditions, such as cardiovascular disease, cancer, Type II diabetes, neuro-degenerative diseases and inflammatory diseases. Researchers are looking into ways to leverage Ontario's berry sector to deliver better products, new functional foods and a nutraceutical ingredient industry. (Paliyath, #26662/200035)
- An increasing number of fermented dairy products are becoming available, mostly as a result of increased consumer awareness of their health benefits. Researchers are looking at fermentation technology to understand how and why it affects health in order to enhance a new generation of foods with increased preventive, and perhaps even therapeutic, properties. (Corredig, #200040)

Case Study

Peter Pauls, Plant Agriculture

*#200043/26684: Bean (*Phaseolus vulgaris*) Improvement for Health and Consumer Acceptance*
June 1, 2009 – May 31, 2013

(up to and including 09/10)

OMAFRA / UofG Research Project Operating	\$15,000
Faculty/CARG FTE	\$22,463
Research Station Use	Elora crop science research station \$3,542 is the value of OMAFRA in-kind contribution (Total value 3,850 less 8% paid by partners)

Tech/Admin Support and Indirect Costs	\$4,840
Total OMAFRA / UofG Project Value (up to and including 09/10)	\$45,845
Partner/In Kind Contributions	\$150,000 for 09/10 and \$450,000 for term of project
Collaborators	Bozzo, G. UofG – Department of Plant Agriculture Navabi, A. , Agriculture and Agri-food Canada Cao, R. , Agriculture and Agri-food Canada Power, K. , Agriculture and Agri-food Canada Shi, J. , Agriculture and Agri-food Canada

Edible or dry bean crops are a valuable part of the diverse \$33 billion agri-food industry in Ontario. They are produced on more than 150,000 acres in Ontario and the crops are worth approximately \$100 million annually.

Nutritionists characterize dry beans as a nearly perfect food because of their high protein, fibre, complex carbohydrates contents, as well as the vitamins, minerals and antioxidants, they contain. Epidemiological and lab studies show that increased bean consumption is associated with reduced cancer rates, obesity, heart disease and neural tube disorders, which have been related to their antioxidant and folate levels.

Despite this there is very little information about which compounds are active as antioxidants in beans and even less information about the activities of the genes that control their synthesis. As Ontario consumers become more health conscious and demand value-added, healthy food products, it is important to the bean industry that this information is discovered and distributed.

This project is studying the genetics of beans to discover the relationships between the antioxidant composition of dry beans, the genes that regulate the synthesis of these bioactives, the activities of the enzymes involved in their synthesis, and their promotion of human health.

The synthesis of antioxidant compounds in plants is a complex process which includes more than 30 different enzymatic steps and additionally, many of the enzymes are coded for by multiple paralogous genes. Only one year into the project, this research team has already begun to characterize this process by mapping the genomic locations of specific genes, cloning and sequencing genes and monitoring expression levels of phenylpropanoid genes in different tissues and genotypes.

The team has also identified a unique, nondarkening, germplasm that has a significantly different expression pattern of key genes in the phenylpropanoid pathway leading to the synthesis of antioxidants in beans. Looking at the differences in gene expression between this material and conventional beans, they will use it to test the effects of antioxidant levels on animal health.

As this project continues, the next steps will be to confirm the presence of antioxidants in various tissues and genotypes.

For this work, a team is being assembled with a broad range of expertise to examine the connections between the antioxidant levels and components in dry bean and their effects on animal health. The team will be looking for significant correlations between antioxidant levels measured biochemically, cancer fighting activities measured in animal feeding trials and gene expression in the plant that lead to their synthesis. Gene expression differences in the plant materials that are related to health will be used to develop gene based markers so bean varieties with enhanced cancer fighting properties can easily be chosen.

With access to information about which bean varieties contain higher levels of antioxidants, there is solid, scientific information to provide to consumers showing beans are not only a healthy choice, but a disease-preventing one.

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. 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 increased.

Highlights from the program this year include:

- Food Science researchers are finding ways to produce healthier meat products by replacing traditional saturated animal fat with novel and feasible alternatives such as organogels. Organogels consist of an organic liquid, such as a highly unsaturated vegetable oil, trapped in a gel network. They have a texture similar to saturated fats. (Barbut, #200062)
- Wrapping together two of Ontario's largest agricultural sectors – soybeans and meat processing -- food science researchers are developing bio-based packaging materials and edible films using the by-products of harvested soybeans. They believe their soy plastics could be a greener, more sustainable alternative to petroleum-based plastic. (Lim, #200059/26663)
- Robots can build cars...so why can't they pick tomatoes? That's what University of Guelph researchers want to know, as they hunt for ways to help Ontario greenhouse growers stay competitive in a rapidly growing industry. (Moussa, #200071/26737)

Case Study

Chris Hall, School of Environmental Sciences

#200058/26724: Product development of a therapeutic antibody in tobacco through production, purification and analytical value chains in Ontario
July 1, 2009 – June 30, 2012

(up to and including 09/10)

OMAFRA / UofG Research Project Operating	\$125,000
Faculty/CARG FTE	\$59,901
Research Station Use	none
Tech/Admin Support and Indirect Costs	\$75,412
Total OMAFRA / UofG Project Value (up to and including 09/10)	\$260,313
Partner/In Kind Contributions	\$150,000
Collaborators	McLean, M. , UofG – School of Environmental Sciences Ghosh, R. , McMaster University Hassell, J. , McMaster University

The annual global therapeutic antibody market is predicted to be over \$30 billion by 2010 as traditionally produced biopharmaceuticals come off patent protection over the next decade. Prof. Christopher Hall and his team are helping Ontario's agri-food industry move a step closer to entering the lucrative antibody market.

Hall's team has shown genetically modified plants can offer an alternative to traditional mammalian cell expression systems for large-scale production of therapeutic antibodies. Plant crops have tremendous potential to produce antibodies that can assist in the treatment for diseases such as AIDS and breast cancer -- easier and more cost-effectively.

Human disease treatment with therapeutic antibodies requires many kilograms of product, which provides an opportunity for the agricultural crops sector to be a significant player in the therapeutic antibody market.

Hall and his colleagues at McMaster University are working to help move plant therapeutic antibodies closer to the therapeutic marketplace, working with colleagues, Drs. Raja Ghosh and John Hassell to purify plant produced therapeutic antibodies and test their efficacy -- starting by creating genetically modified tobacco plants that efficiently express the anti-cancer antibody Herceptin.

Antibodies have lots of other uses, too. Instead of extracting the antibodies, certain ones can also be left in the plants, to help plants resist certain environmental contaminants. Students and technicians in Hall's laboratory are working on a way to help greenhouse plants resist a blight and rot fungus called *Pythium aphanidermatum*. It spreads quickly by spores, and currently has no effective control. The antibody they're working toward would help plants resist infection caused by the spores of the fungus and have huge impacts on the greenhouse industry.

Another use being developed by the research team is bioactive paper, in which the harvested antibodies can be bound to paper as a coating to capture pathogens.

This technology can be used to make filters to remove pathogens from water in home applications, as well as large-scale city water facilities. Several other products are possible with this antibody-based paper -- protective clothing, air filters, face masks, food packaging and biohazard detection.

Antibodies are big business and this research is finding ways to not only position Ontario's agri-food industry as a major player in this business, but to also find ways to provide Ontarians with more cost-effective and readily available ways to treat and prevent disease.

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, Ontario's changing demographics and market opportunities, 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:

- Disease detection in livestock may soon be encapsulated in a plastic monitoring device (telemetric bolus) that emits a wireless signal, giving farmers a computerized, non-invasive look at what's going on inside their animals. Researchers at the University of Guelph have used this diagnostic tool to detect common illnesses even before clinical symptoms appear. (McBride, #200103)
- Animal and Poultry Science researchers are using infrared cameras (similar to those used in medical testing) to assess cattle's feed efficiency -- their ability to convert food into growth and weight gain. The researchers say the novel use of infrared cameras on farms could improve the way producers identify their most feed-efficient cattle, and, as well, make their herds more environmentally friendly by determining how much heat and methane the animals release from their bodies. (Miller, #26360)
- To increase consumer options in the grocery store, a team of researchers at the University of Guelph is working to enrich pork with omega-3. By feeding flax seed oil to young pigs, these researchers have already shown that about 70 per cent of ingested omega-3 fatty acids are retained in each pig. (deLange, #26358)

Plants:

- Lycopene, a powerful antioxidant found in tomatoes, is being bumped up in new varieties being developed at the University of Guelph's Ridgetown campus. The research team's goal is to create the ultimate tomato for processing (for ketchup, tomato sauce and tomato

paste). New varieties will benefit farmers' bottom line, and exceed consumers' nutritional expectations for tomato products. (McDonald, #026484)

- Timing is everything when it comes to optimizing a corn crop's yield, researchers have found. Recent research has shown there is a 30-bushel "yield kick" by spraying herbicides once, at the three-to-four leaf stage. (Swanton, #026353)
- UofG Plant Agriculture researchers have found a giant ragweed biotype that is showing resistance to the popular herbicide glyphosate. The researchers are conducting further greenhouse and field trials on the weed biotype to confirm resistance, as well as to identify potential management options. Researchers will also be working to understand the genetic and biochemical basis for resistance. (Swanton, #026353)

Case Study (Livestock)

Eva Nagy, Pathobiology

#026371: Enhancing poultry health and welfare
May 1, 2006 – April 30, 2010

(up to and including 09/10)

OMAFRA / UofG Research Project Operating	\$522,000
Faculty/CARG FTE	\$889,324
Research Station Use	Arkell poultry value \$146,900 (Total value less amount paid by partner funding) Isolation unit value \$72,037 (Total value less amount paid by partner funding)
Tech/Admin Support and Indirect Costs	\$681,298
Total OMAFRA / UofG Project Value (up to and including 09/10)	\$2,311,559
Partner/In Kind Contributions	\$866,600 for 09/10 and \$3,418,400 for term of project
Collaborators	Armstrong, C. , UofG-Biomedical Science, Barbut, S. , UofG – Food Science, Bedecarrats, G. , UofG – Animal and Poultry Science, Bendall, A. , UofG – Molecular and Cellular Biology, Golovan, S. , UofG –Animal and Poultry Science, Hunter, B. , UofG – Pathobiology, Prescott, J. , UofG – Pathobiology, Sharif, S. , UofG – Pathobiology, Squires, J. , UofG – Animal and Poultry Science,

	Wood, D., UofG – Pathobiology, Zhou, H., UofG –School of Engineering, Gong, J., - Agriculture and Agri-food Canada
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The poultry industry is a key contributor to the success of Ontario's agriculture, and in turn, of Canada because Ontario is the largest producer and processor of chickens in the country. The value of the province's poultry and egg processing sector is in excess of \$1.6 billion per year. This number can only increase. There has been a steady rise in chicken meat consumption from 22.3 kg/person in 1992 to 31.8 kg/person in 2006. As a result, improving preventative strategies for the maintenance of poultry health is of great importance to this industry in Ontario.

Healthy animals mean healthier products and a more profitable industry. So much so, that the Ontario poultry industry has recently identified health as one its three main objectives. Infectious diseases have significant economic impacts through use of costly medicines, increased mortality and condemnation, diminished production, food safety concerns, and possible embargos. These problems are compounded by vaccine breakdowns and emergence of more virulent strains of pathogens.

This research looked at the birds as individuals and as flocks, and their interaction with the environment and infectious microbial diseases with the goal of maintaining the superior health status of chickens to in turn increase production efficiency and provide a safer food source for human consumption. As well, the team looked at factors that contribute to development and functioning of a strong immune system, and also looked to provide a framework for enhancement of disease resistance in Ontario's poultry flocks via genetic selection, transgenesis and tailored novel vaccine design.

Vaccines currently available do not appear to be highly protective against diseases that affect poultry, due to emerging more virulent strains. This makes it crucial to expand our knowledge of immunity against microbial agents and develop more effective and novel vaccines. The results of these studies have provided a framework upon which the methods for enhancement of protection now be envisioned. Moreover, the results will contribute to the ability of intensive animal production to be successfully carried out without the use of antimicrobial drugs and improve consumer acceptance of intensive broiler chicken production.

This is important as consumers increasingly demand an antibiotic-free product. In commercial broiler production with chicks raised on antibiotic-supplemented feed, a mortality rate of up to 5% may be expected. However, in antibiotic-free poultry production schemes, this number increases. There is evidence that birds raised in organic settings have a higher incidence of bacterial, viral and protozoan infections. As well, modern chickens have been genetically selected on antibiotic-supplemented feed. As a result, removing antibiotics from poultry production may have a significant impact on the genetic performance of flocks and response of chickens to genetic selection.

This research found that probiotics can be used as a strategy for control of viruses and bacteria which occur in the intestines of chickens causing disease -- most frequently diarrhea and also for enhancement of immune response, both systemically and at the gut level. The benefits of using probiotics especially in poultry, has been mostly empirical to date, with little strong scientific evidence to support their use. This study is among the first to characterize immunological aspects of the action of probiotics in chickens and in doing so, has laid the foundation to develop more effective substitutes for antibiotics, enhancing poultry production

economy and food safety in an antibiotic-free production system – healthier animals, for a healthy economy.

Case Study (Plants)

Ernesto Guzman, School of Environmental Sciences

#26728/200077: *Evaluation of the Entomopathogenic Fungi, Beauveria bassiana, clonostacy rosea, and Metarhizium anisopliae, as Biocontrol Agents against the honey bee parasitic parasite mite varroa destructor*

June 1, 2009 – May 31, 2011

(up to and including 09/10)

OMAFRA / UofG Research Project Operating	\$34,999
Faculty/CARG FTE	\$74,876
Research Station Use	none
Tech/Admin Support and Indirect Costs	\$16,134
Total OMAFRA / UofG Project Value (up to and including 09/10)	\$126,009
Partner/In Kind Contributions	\$38,000 for 09/10 and \$82,000 for entire project
Collaborators	Sutton, J. , UofG – School of Environmental Sciences Van Alten, A. , Ontario Beekeepers Association Provincial Apiarist-OMAFRA

In hives across North America, honeybee population losses have risen over the last three winters to rates as high as 37 per cent — more than double the usual mortality rate. It is a critical turning point for honeybees in a struggle for survival against parasitic mites.

“The main factor associated with bee mortality is the spread of *Varroa* mites”, says University of Guelph Prof. Ernesto Guzman, School of Environmental Sciences. These mites are external parasites that suck the blood from honeybees. They’re similar to a small tick, and they are visible to the naked eye, being about the size of a pin head.

However, a mite of this size is still extremely damaging to a honeybee.

“If you make a fist, imagine that’s the size of a comparative parasite that could suck blood from a human,” says Guzman. “This parasite is huge for the size of a honeybee.”

Bees that are infested live no more than 50 per cent of their normal lifespan, and will be less likely to forage and pollinate. A healthy bee would live about 30 days during the summer, the time of highest activity, and could live about four months during the winter, the time of lowest

activity. In both cases, *Varroa* mites affect the colony. In the summer the infested bee will not reach the foraging age (18-20 days) and in the winter, the infested bee will not see the spring.

The role of insect pollination in Canadian agriculture is valued at some \$1 billion annually, with honeybees accounting for about 75 per cent of that amount. Until issues with honeybee health and population decline are resolved, beekeepers are keeping pace with their losses by importing bees from countries such as Australia. Some have also resorted to splitting their remaining colonies and introducing new queens to the deficient halves to create new hives.

But it's economically unsustainable to continue with this trend, says Guzman. "It's very costly to split colonies. They don't usually produce honey the next summer because you weaken the population," he says.

He's investigating alternative strategies to combat rising bee mortality rates. He's found that certain organic compounds can control mite infestation by as much as 97 per cent. These compounds include thymol (from the herb thyme), oregano oil and clove oil and are relatively non-toxic to bees.

Guzman hopes these compounds could also replace the synthetic pesticides originally suspected to have played a significant role in pollinator decline. Sometimes applied to eliminate mites, pesticides can accumulate to toxic levels over time in the beeswax that makes up the hive.

And although synthetic pesticides have been harmful to bees, *Varroa* mites have been developing a resistance to them. Guzman has found that the organic compounds have effectively controlled the mites without harming the bees.

He and other researchers are also seeing if selective breeding could give bees a genetic resistance to *Varroa* mites. These methods are currently being tested in a controlled laboratory environment. Guzman says if results continue to look promising, the researchers will begin testing in bee hives.

Business Development Office

2009/10 was another year of change and evolution for the Business Development Office (BDO). The changes enabled BDO to increase its efficiency and augment its impact on the University in the coming years. The highlights are listed and briefly discussed below:

- A working Intellectual Property Policy was established for use by BDO for all University of Guelph inventors, based on the University of Guelph Faculty Association agreement on intellectual property, which was formulated in 2008/09. The working policy provides clarity to all parties regarding the rights and responsibilities associated with new intellectual property. Coupled with this, a detailed process document was written that is consistent with the working policy.
- During 2009/10, the BDO was led by two interim directors. Sue Bennett, who guided the office until December 2009, helped to establish the position of OMAFRA Technology Transfer Manager, and organized the relocation of the BDO to new offices. Martin Bosch led the office until May 2010, and helped to enable a smooth transition to new leadership. In May 2010, Erin Skimson was appointed Director of BDO. Erin arrives at the BDO having

held several management positions at Stryker Canada. She has a strong background in management, marketing, leadership and partnership building as well as technology and business development.

- The BDO moved locations from 130 Research Lane to 150 Research Lane in August 2009. The new cost-efficient space includes a sizable boardroom and available parking and enables greater interaction among staff while maintaining the BDO's business-friendly location.
- The position of OMAFRA Technology Transfer Manager was fully established. The incumbent, Tyler Whale, has played a significant role in targeted outreach to University of Guelph faculty who are participants in the Partnership Agreement. Additionally he has been an active participant in the Partnership's Knowledge Translation and Transfer (KTT) initiatives.
- The BDO has initiated an Industry Liaison Program starting January 2010, with the goal of increasing the interaction between researchers on campus and external companies. The program will benefit companies, especially Ontario companies, by facilitating their access to University faculty who are best able to help with their research needs. The program will benefit the University by raising the awareness of faculty to the needs of innovative companies while at the same time increasing industry sponsored research on campus. The incumbent, Richard Puntis, has not only enabled dozens of one-on-one meetings between companies and researchers he has also guided a \$1.2 million FedDev application that will enable projects with fifteen different companies if successful.
- BDO staff attended several industry-attended events and conferences in 2009/10, enabling strong interaction with decision-makers at large companies. These interactions may lead to greater research collaboration in the future. The events included BIO 2010 and the International Food Technology Expo, an event that brings together professionals involved in both the science and the business of food - experts from around the world from industry, academia, and government.
- BDO staff continue to manage the Proof of Principle (POP) Fund. Details of three POP technologies are found on pages 136-137.

Case Study #1: Organic Growing Substrates Containing Vermicastings

Technology: Zheng 20100423

Title: Growing Substrates

Disclosure Date: April 23, 2010

OMAFRA split: 70% (estimate, calculation in progress)

Themes: New Directions OMAFRA grant

Technology Summary: As a result of a 3-year R&D program, two trade secret growing substrates were developed in a co-funded project (funding sources include OMAFRA, OCE and Forterra Inc.). The goal of the research was to develop superior organic growing substrates for greenhouse vegetable production as well as for home gardeners who can use these blends to

improve their growing success for vegetables and other plants. In addition, unsustainable growing substrate components such as peat were avoided. The result of these consistent high-quality organic growing substrates is extremely beneficial to the organic vegetable market where it has been a significant challenge in the past to access such blends.

Of the 35 blends tested, four treatments were used in the evaluation experiment to study the effects on the marketable yield of organically produced greenhouse tomatoes (beefsteak; cultivar Matrix F1 Hybrid, untreated) as compared to conventionally produced greenhouse tomatoes. The conventional system used rock wool as the growing substrate and conventional chemical fertilizers. Results from the evaluation experiment showed that 2 of the substrates had significantly higher mean marketable yields per plant compared to the conventional treatment. A similar trend was seen in the Blossom End Rot (BER) infections per plant where the same 2 substrates had statistically lower BER incidence when compared to the conventional system.

License: An exclusive license deal was signed with Forterra in May 2010. Forterra is an Ontario-based public SME that manufactures, markets and sells premium organic soil-enrichment products utilizing worm castings. This technology will allow them to gain significant market advantage in the growing substrate space with sale of their product expected to start in 2011 along with royalty payments to the UofG and OMAFRA.

Future Research: Discussions are underway to continue the collaborative research projects with Forterra that would involve further scientific investigation into soil mixes and other solutions using the company's worm castings as the base or as a carrier.

Promotion of the project has occurred through press releases from Forterra Inc., Greenhouse Canada and articles in The Buzz.

Case Study #2: High Immune Responding Cattle

Technology: Mallard 079981

Title: Method of identifying high immune response periparturient animals

Disclosure Date: November 1, 1999

OMAFRA split: 50%

Theme: Production Systems

Technology Summary: Impairment of peripartum host defenses of dairy cows is thought to contribute to increased occurrence of disease, particularly mastitis. The ability to identify cows with superior immune response during the peripartum period may therefore lead to selective breeding of dairy cattle with increased disease resistance. This invention describes the formulation of a mathematical index to identify cows with high, average or low peripartum antibody response following immunization with antigen not previously encountered by that animal.

Patent Status: There are 3 issued patents associated with this technology (2 US and one Canadian), as well as significant proprietary 'know-how'.

Strategy: Despite this technology being with the BDO for more than 10 years, the inventors are still motivated to advance and commercialize the technology. The current strategy is to enable

the inventors to take a larger role in advancing the technology to market. Toward this end, a successful NSERC I2I grant has been awarded to improve the market research and gauge opportunity for a new company, possibly led by the inventors themselves.

Case Study #3: Green Ripple Innovations

Technology: Mohanty 20100318

Title: Recycled plastic and biocomposite formulations

Disclosure Date: March 18, 2010

OMAFRA split: TBD

Themes: Product Development; Bioeconomy

Technology Summary: The Bioproducts Development and Discovery Centre (BDDC), led by Profs. Amar Mohanty and Manjusri Misra, leads the University of Guelph's efforts to research and develop products that use biological materials, farm waste and recycled plastics to make new polymer materials with beneficial properties and reduced carbon impact compared to conventional plastics.

Green Ripple Innovations is an innovative company based in Cambridge, Ontario that focuses on developing new packaging and durable goods materials. Their focus is on reducing environmental impact through controlling packaging size and weight, as well as incorporating biodegradable material or biological filling material while maintaining structural properties.

The University of Guelph has entered into a license agreement with Green Ripple whereby new product formulations will be developed at the BDDC based on specifications provided by Green Ripple, and Green Ripple will use those formulations to develop products for the market that achieve the goal of a reduced environmental impact. Examples of products might include garbage bins. Precise formulations will be considered a trade secret, and the University expects to receive a royalty on sales made by Green Ripple. It is hoped that the first such product sales might happen in 2011.

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

The Ontario Veterinary College (OVC) and its VCEP program aim to be internationally renowned, accredited and respected as a leader in training veterinarians who are skilled in maintaining the health and welfare of animals and knowledgeable about their interrelationship with people and the environment.

OVC is at an exciting juncture as it moves towards its 150th anniversary in 2012. It continues to advance towards our goal of being a defining voice that integrates animal, human and environmental health.

Although OVC was granted renewal of full accreditation in March 2009, based on a formal site visit, an annual update report is required to the AVMA/CVMA Council on Education (COE). On March 15, 2010 a letter was received from the COE indicating continued full accreditation. 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. The accreditation process focuses on the Doctor of Veterinary Medicine program and the institutional resources, infrastructure and personnel that support it. 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) has finalized its plans for renovation of the space to be vacated by the Pathobiology department and the Animal Health Laboratory once they move into the new building facing Gordon Street. These renovations will provide the much needed research infrastructure for the work being conducted by the various faculty associated with the Centre. The construction will be funded by a \$1million grant from the Canada Foundation for Innovation (CFI). 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.

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. Graduates are highly sought after by employers and virtually all of those seeking positions found jobs within a few months of graduation. Annual employer surveys of new graduates showed a continued trend of high satisfaction with these new veterinarians.

To further support the training of future food animal veterinarians, the Bovine Education Trust, a charitable endowment fund established by the Ontario Association of Bovine Practitioners (OABP) and the Ontario Veterinary College (OVC), was launched. The objective is to provide financial support for veterinary students to obtain more real-life learning opportunities and on-the-job experiences that they need to develop successful careers serving the dairy and beef industries. The fund was officially launched at the spring meeting of the OABP held April 15, 2010 in Guelph. Start-up funding is being provided by the Ontario Ministry of Agriculture, Food and Rural Affairs through the Veterinary Clinical Education Program.

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 Master of Public Health (MPH) program enrolled its second class of 15 students in the fall of 2009 and graduated the first class of 15 students in the spring of 2010. The program is a 5-semester professional degree with concentration in epidemiology, environmental public health, infectious diseases, and zoonotic, foodborne and waterborne diseases.

THE OMAFRA/UoFG PARTNERSHIP FINANCIAL REPORT

The financial reporting included in this Annual Report 2009/10 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, 2009 to April 30, 2010”, as submitted to OMAFRA on September 28, 2010 and included here in its entirety. (Appendix C)
2. Summary of Revenues and Expenses (Fully Allocated)

This summary shows the **actual revenues and expenses (fully allocated) for fiscal 2009/10 (May 1, 2009 to April 30, 2010) for each of the four 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 spend 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 seven 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 seven 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, 2009 - April 30, 2010).
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 09/10 Actuals - Revenue & Expenses of Entire Agreement by Program (in thousands of dollars)

Renewed Agreement: All Programs							
	Object Category	Research	Vet Clinical Education	Agri-Food Lab	Animal Health Lab	ARIO Minor Capital	Total Agreement
Revenue	OMAFRA Agreement	(41,486)	(5,317)	(3,664)	(6,776)	-	(57,243)
	OMAFRA Other	-	-	(250)	(250)	(5,365)	(5,865)
	Sales Goods & Services	(3,809)	-	(10,144)	(3,505)	-	(17,458)
	Other Revenue & Interest	(1,606)	-	(10)	(6)	-	(1,622)
Total Revenue		(46,901)	(5,317)	(14,068)	(10,537)	(5,365)	(82,188)
Expenses	Personnel	19,544	1,844	8,522	7,387	16	37,314
	Faculty Pool Costs	9,915	1,900	-	-	-	11,815
	Operating	11,448	1,468	5,786	4,411	5,349	28,462
	Internal Sales & Recoveries	(3,415)	-	(527)	(1,461)	-	(5,403)
	Indirect Costs	9,409	105	287	199	-	10,000
	Total Expense	46,901	5,317	14,068	10,537	5,365	82,188
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	(3,698)	(522)	-	(1,614)	-	(5,834)
	OMAFRA Other	-	-	-	-	-	-
	Sales Goods & Services	-	-	-	-	-	-
	Other Revenue & Interest	(5)	-	-	(4)	-	(9)
Total Revenue		(3,703)	(522)	-	(1,618)	-	(5,843)
Expenses	Personnel	1,276	230	-	529	-	2,035
	Faculty Pool Costs	-	-	-	-	-	-
	Operating	1,504	277	-	1,024	-	2,805
	Internal Sales & Recoveries	2	-	-	-	-	2
	Indirect Costs	921	15	-	64	-	1,000
	Total Expense	3,703	522	-	1,618	-	5,843
Net Expense (Revenue)		-	-	-	-	-	-

Con't-SUMMARY 09/10 Actuals-Revenue and Expenses of Entire Agreement by Program(in thousands of dollars)

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	(45,184)	(5,839)	(3,664)	(8,389)	-	(63,077)
	OMAFRA Other	-	-	(250)	(250)	(5,365)	(5,865)
	Sales Goods & Services	(3,809)	-	(10,144)	(3,505)	-	(17,458)
	Other Revenue & Interest	(1,611)	-	(10)	(10)	-	(1,631)
	Total Revenue	(50,604)	(5,839)	(14,068)	(12,154)	(5,365)	(88,031)
Expenses	Personnel	20,820	2,074	8,522	7,917	16	39,349
	Faculty Pool Costs	9,915	1,900	-	-	-	11,815
	Operating	12,952	1,745	5,786	5,435	5,349	31,268
	Internal Sales & Recoveries	(3,413)	-	(527)	(1,461)	-	(5,401)
	Indirect Costs	10,330	120	287	263	-	11,000
	Total Expense	50,604	5,839	14,068	12,154	5,365	88,031
Net Expense (Revenue)		-	-	-	-	-	-

1. See the following pages; 39 and 40, for the breakout of Research Program by Theme / Sub-program.

Summary 09/10 Actuals – Revenue and Expenses by Research Sub- Program (in thousands of dollars)

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	(20,453)	(811)	(1,588)	(3,440)	(607)	(705)	(25)	(7,337)	(6,522)	-	-	(41,486)
	OMAFRA Other	-	-	-	-	-	-	-	-	-	-	-	-
	Sales Goods & Services	(335)	-	-	(3)	-	(1)	-	(3,387)	(83)	-	-	(3,809)
	Other Revenue & Interest	(188)	(5)	(10)	(28)	(4)	(6)	-	(547)	(818)	-	-	(1,606)
Total Revenue		(20,976)	(816)	(1,598)	(3,471)	(611)	(712)	(25)	(11,271)	(7,423)	-	-	(46,901)
Expenses	Personnel	7,604	165	323	824	154	282	14	7,673	2,506	-	-	19,544
	Faculty Pool Costs	7,509	315	579	1,211	158	143	-	-	-	-	-	9,915
	Operating	(23)	60	152	424	97	94	3	4,728	5,913	-	-	11,448
	Internal Sales & Recoveries	(540)	(2)	(5)	(91)	(3)	(20)	-	(1,597)	(1,157)	-	-	(3,415)
	Indirect Costs	6,425	278	549	1,103	205	213	8	467	161	-	-	9,409
	Total Expense	20,976	816	1,598	3,471	611	712	25	11,271	7,423	-	-	46,901
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	(1,784)	(344)	(347)	(143)	(167)	(355)	(182)	-	-	(46)	(330)	(3,698)
	OMAFRA Other	-	-	-	-	-	-	-	-	-	-	-	-
	Sales Goods & Services	-	-	-	-	-	-	-	-	-	-	-	-
	Other Revenue & Interest	-	-	-	-	-	-	-	-	-	-	(5)	(5)
Total Revenue		(1,784)	(344)	(347)	(143)	(167)	(355)	(182)	-	-	(46)	(335)	(3,703)
Expenses	Personnel	356	173	198	61	81	158	102	-	-	16	131	1,276
	Faculty Pool Costs	-	-	-	-	-	-	-	-	-	-	-	-
	Operating	1,002	80	57	44	52	103	32	-	-	18	116	1,504
	Internal Sales & Recoveries	2	-	-	-	-	-	-	-	-	-	-	2
	Indirect Costs	424	91	92	38	34	94	48	-	-	12	88	921
	Total Expense	1,784	344	347	143	167	355	182	-	-	46	335	3,703
Net Expense (Revenue)		-	-	-	-	-	-	-	-	-	-	-	-

Continued: Summary 09/10 Actuals Revenue and Expenses by Research Sub (*in thousands of dollars*)

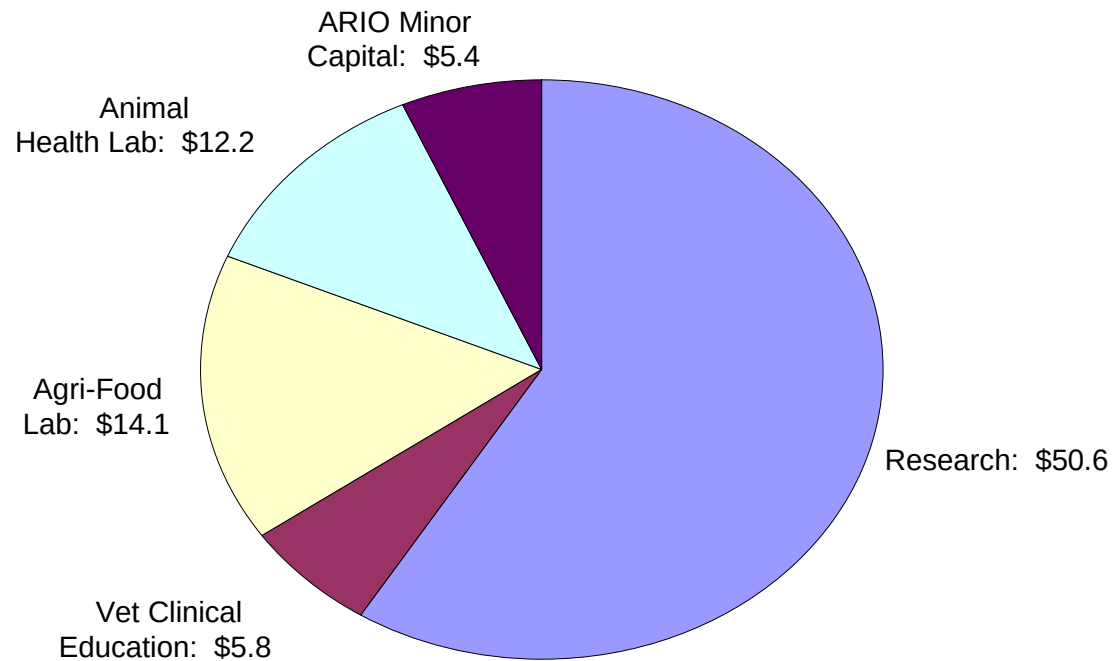
Total Partnership (Renewed Agreement & New Initiatives): Research

		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	(22,237)	(1,155)	(1,935)	(3,583)	(774)	(1,060)	(207)	(7,337)	(6,522)	(46)	(330)	(45,184)
	OMAFRA Other	-	-	-	-	-	-	-	-	-	-	-	-
	Sales Goods & Services	(335)	-	-	(3)	-	(1)	-	(3,387)	(83)	-	-	(3,809)
	Other Revenue & Interest	(188)	(5)	(10)	(28)	(4)	(6)	-	(547)	(818)	-	(5)	(1,611)
Total Revenue		(22,760)	(1,160)	(1,945)	(3,614)	(778)	(1,067)	(207)	(11,271)	(7,423)	(46)	(335)	(50,604)
Expenses	Personnel	7,960	338	521	885	235	440	116	7,673	2,506	16	131	20,820
	Faculty Pool Costs	7,509	315	579	1,211	158	143	-	-	-	-	-	9,915
	Operating	979	140	209	468	149	197	35	4,728	5,913	18	116	12,952
	Internal Sales & Recoveries	(538)	(2)	(5)	(91)	(3)	(20)	-	(1,597)	(1,157)	-	-	(3,413)
	Indirect Costs	6,849	369	641	1,141	239	307	56	467	161	12	88	10,330
	Total Expense	22,760	1,160	1,945	3,614	778	1,067	207	11,271	7,423	46	335	50,604
Net Expense (Revenue)		-	-	-	-	-	-	-	-	-	-	-	-

Summary 09/10 Actuals - Fully Allocated Research Program Expenses by Research Sub- Program (*in thousands of dollars*)

	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:	22,760	1,160	1,945	3,614	778	1,067	207	11,271	7,423	46	335	50,604
Allocation of ARIO Research Station Costs	17,147	-	-	1,483	32	-	32	(11,271)	(7,423)	-	-	-
Fully Allocated Theme Expenses	39,907	1,160	1,945	5,097	810	1,067	239	-	-	46	335	50,604

Summary 09/10 Actuals – Revenue and Expenses of Entire Agreement by Program (\$million's)



PERFORMANCE REPORTS

Performance Indicators for the OMAFRA – UofG Agreement (2009/10)

Thirty nine performance indicators (PIs) were jointly developed by OMAFRA and the UofG at the outset of the current Agreement, to provide better accountability and transparency of funding under the new Agreement. The over arching 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 and two PIs were also later developed for joint management of intellectual properties.

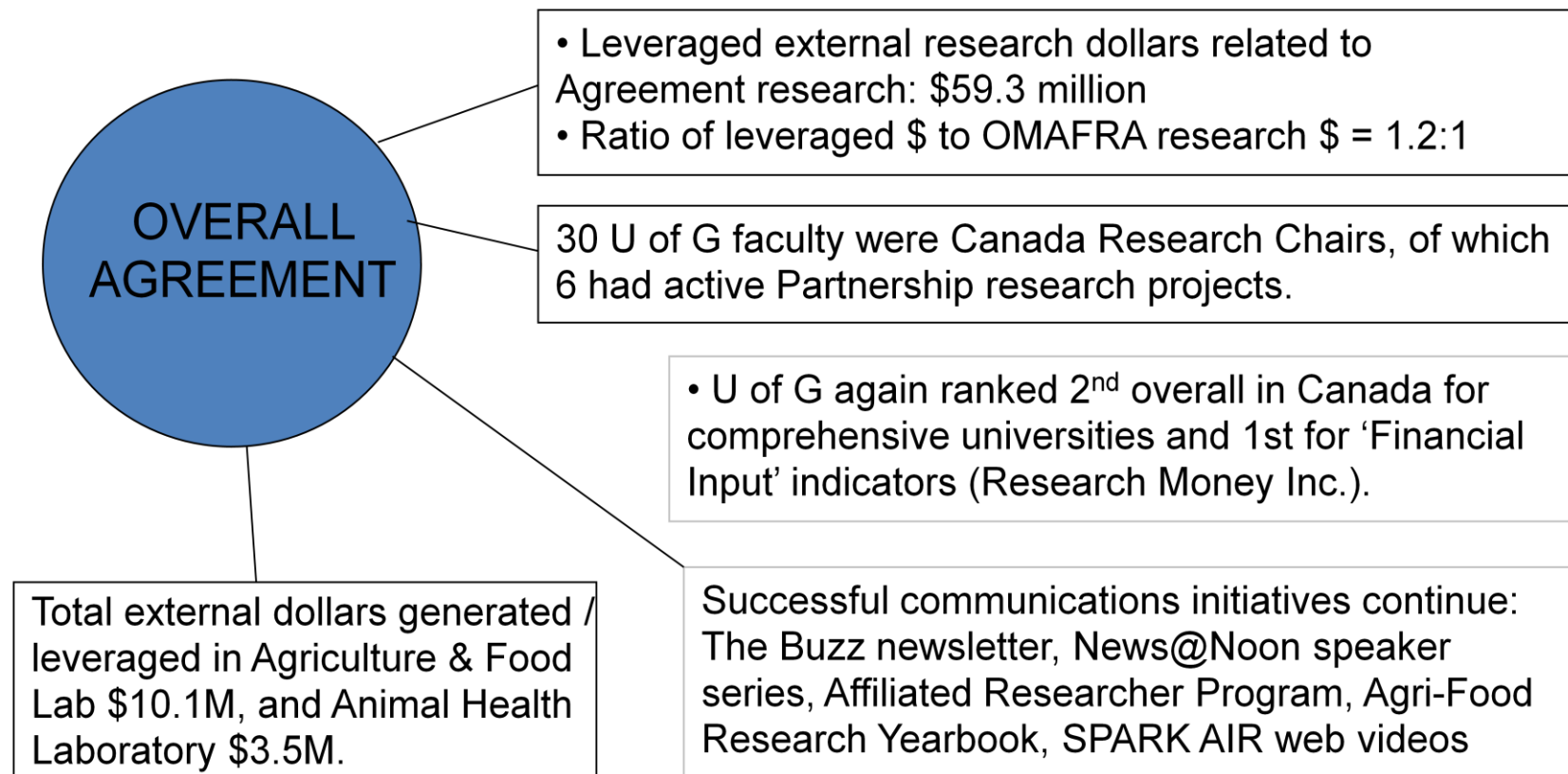
In 2009/10 all of the program management committees of the Agreement reviewed and made recommendations to the Executive Committee for revisions to their performance indicators. The objective of the revisions was to better reflect program outputs that were meaningful in their contribution to the Agreement's overall objectives. The PIs reported on the following pages of this 2009/10 Annual Report reflect those revisions approved by the Agreement Executive Committee; with the exception of AFL whose revised PIs come into effect for 2010/11.

PIs for each of the program management committees are reported on the following pages. PIs for joint intellectual property management are included in Research PI #8 and Proof of Principle Fund under 'Other Reporting' on page 136.

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:	Ranking as per 2008 results. UofG ranked 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 (2009/10):	The most current (2009) Research Money Inc. report of Canadian universities' standings ranks UofG 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:	Scientific and technical FTEs as per 2008/09 results. Research: 171.9 VCEP: 45.9 AFL: 53.0 AHL: 71.0
	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 (2009/10):	Number of faculty, scientific and technical FTEs supported or leveraged by the Partnership research projects: Research: 188.98 Number of faculty FTEs engaged in projects supportive of OMAFRA priorities (but not allocated to approved OMAFRA Partnership projects) is estimated at 230 '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:	2008/09 results are the baseline. 25 faculty members 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 (2009/10):	30 faculty members in 2009/10 were Canada Research Chairs, of which six 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 (2009/10):	Research: 18.6 million – see R1b AHL: 3.5 million – see Financial Table on page 37 AFL: 10.1 million – see Financial Table on page 37 VCEP: no revenue generation
	Metric (b)	Total non-OMAFRA program revenue
	Baseline:	2008/09, total non-OMAFRA program revenue Research: 6.4 million AHL: 3.7 million AFL: 9.5 million, 0.3 from OMAFRA not related to Agreement VCEP: no revenue generation
	Target:	2009-13: total non-OMAFRA revenue ≥ 2008/09 baselines.

	Results (2009/10):	Research: 5.4 million AHL: 3.5 million AFL: 9.8 million, 0.3 from OMAFRA not related to Agreement 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:	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 (2009/10):	Survey will be conducted every 2 years.
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.

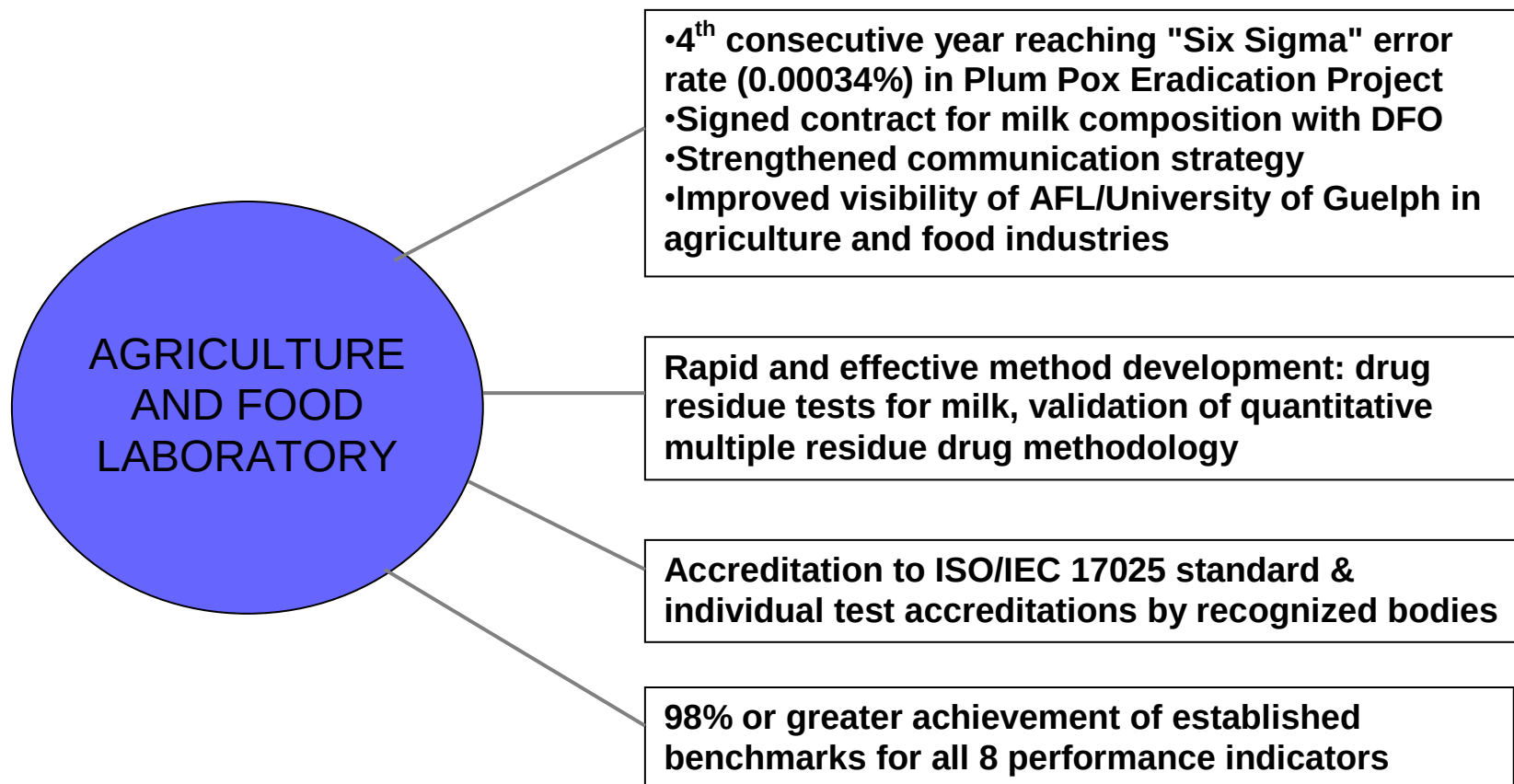
	Target:	2009/10: Evaluation plan for year five to be undertaken and approved in 2009-10, describing content and format of 2012-13 report.
	Results (2009/10):	Examples of 2009/10 results that will contribute to OA4: • R8e data to measure the revenue, innovation and commercial benefits generated • Joint IP case studies: 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 (2009/10):	Examples of 2009/10 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. • Evaluation plan documents gathered in support of the 2012/13 report and a 2010/11 interim review.

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 2009/10, describing content and format of 2012-13 report.
	Results (2009/10):	Examples of 2009/10 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 • Evaluation plan documents gathered in support of the 2012/13 report.

AGRICULTURE AND 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 (2009/10):	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). 1. In January 2010, University of Guelph, Laboratory Services (LS), including the Agriculture and Food Laboratory (AFL), successfully passed the surveillance audit and updated the registration to the ISO 9001:2008 standard. No major or minor non-conformances were detected. The 2010 assessment report is available for on-site review.

		2. In May 2009, LS had 157 scope listings including 153 tests in AFAP and 4 procedures in TMDENRT. 3. June 2009, LS/AFL withdrew accreditation from 11 inactive tests (final list available in Fourth Quarter report). 4. July 2009, SCC minor scope extension (April 2009 application), two tests were added to LS/AFL's SCC scope of accreditation a. TOXI-064 Metals in food by ICP-MS b. MID-226 The detection of <i>Listeria</i> species from environmental surfaces using the DuPont Qualicon Bax system method and direct plating (modified MFLP-15) 5. September 2009, SCC biennial assessment (Sept 28 to Oct 1, 2010). Eight SCC assessors were on-site reviewing LS/AFL's quality management system and technical competence to perform tests listed on the scope of accreditation. LS/AFL applied to add 10 new tests to the scope of accreditation: c. MID-224 Determination of B complex vitamins thiamin (B₁), riboflavin (B₂), niacin (B₃), panthothenic acid (B₅), pyridoxin (B₆), biotin (B₇), folic acid (B₉) and cyanocobalamin (B₁₂) d. TOPS-129 Polycyclic aromatic hydrocarbons (PAH) using GC-MSD (modified CFIA MET-012-01) e. TOXI-061 Determination of trichothecene mycotoxins by gas chromatography with ion-trap mass spectrometer detection using acetonitrile chemical ionization (modified CFOA-FD-TOXINS-TRICO) f. TOXI-068 VICAM AOZ HPLC (aflatoxin, ochratoxin, zearalenone) g. SNL-058 Water extractable sodium from feed. h. TOPS-141 Determination of x-Imidazolidenethione in fruits and vegetables by GC/MSD (modified SPR-008-V1.2) i. TOPS- 142 Pesticides in fruits and vegetables by liquid chromatography / electrospray ionization-tandem mass spectrometry (modified CFIA PMR-006-V) j. PDC-015 Detection of <i>Clavibacter michiganensis</i> subsp michiganensis using PCR k. PDC-116 Detection of <i>Plasmodiophora brassicae</i> using PCR l. PDC-117 Detection of <i>Phytophthora</i> species in plant samples by ELISA 9 CFIA-OLF PQ-PR093.02) The SCC assessors issued a reassessment / scope extension visit report summarizing the observations, required responses and commendations. The laboratory response was due within 90 days. 6. November 2009, LS/AFL submitted the required responses to the SCC biennial assessment,
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	within 45 days of the SCC biennial assessment report. 7. February 2010, the SCC approved all corrective actions from the September 2009 biennial assessment. The ten tests listed above were added to the SCC scope of accreditation. • April 30, 2010. LS has 158 listings on the SCC scope of accreditation. LS/AFL is accredited by the Canadian Association for Laboratory Accreditation (CALA) for environmental tests. In the 2009/10 the CALA biennial assessment occurred concurrently with the SCC assessment. In May 2009, the CALA scope of accreditation included 22 environmental listing, including 4 licensed tests under the Ontario Safe Drinking Water Act. There were several changes to the CALA scope of accreditation in 2009/10. 1. July 2009, LS/AFL withdrew CALA accreditation for 4 tests (6 appendices): a. MID-174 <i>Escherichia coli</i> – soil, solid biosolids; wastewater b. MID-149 <i>Salmonella</i> – soil, solid biosolids; wastewater c. MID-200 <i>C. perfringens</i> – soil, solid biosolids d. MID-125 <i>E. coli</i> O157 – potable water 2. September 2009, CALA biennial assessment took place concurrently with the SCC biennial assessment. The three CALA assessors reviewed LS/AFL's quality management system and the technical competency to perform the listed environmental tests. The assessors issued an assessment report summarizing observations and required actions. 3. November 2009, LS/AFL submitted the required responses of the CALA biennial assessment. 4. February 2010, CALA final approval of LS/AFL response to the biennial assessment and approved continuing accreditation of Laboratory Services, University of Guelph 5. April 30, 2010, LS/AFL is accredited by CALA for 16 tests, including 4 licensed tests under the Ontario Safe Drinking Water Act. Proficiency Testing In the Food Safety Testing program at the AFL, 95 Proficiency Test (PT) panels were performed. A total of 342 PT results were reported, 97% of which were satisfactory. In the Horticultural and Agricultural Land Use and Environmental Management programs 123 PT
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		results were reported, 93% of which were satisfactory. When a PT result is identified as questionable or unsatisfactory, the problem is investigated, corrective action applied and documented. The goal of the corrective action is to regain satisfactory status.
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 (2009/10):	The Agriculture and Food Laboratory has met or exceeded the requirement: • Turn-around time for test results 99% of the time over the full fiscal year 2009/10. • Corrected reports - 99% compliance met (99.9%) • Non-conforming samples – 99% 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:	2008/09 results to be the baseline. (<0.01%)
	Target:	2010 – 2013: Target is to manage the incidents every year with demonstration of continuous improvements.

	Results (2009/10):	64 Non-Conformance reports were filed during the processing/ testing/ reporting of 397,387 sample sets. (<0.0001% of samples affected) 10/64 incidents resulted from OMAFRA non-conformance, 54/64 incidents were non OMAFRA/ UofG Consolidated Annual Report 2009/10 16 conformances of AFL. Improvements installed over the past year are aimed at eliminating recurrence of specific non-conformances and preventing future ones. Specifically: - Consolidated sample preparation areas have been implemented to streamline the set-up process - Moving to more automated processes long term across the laboratory, e.g. automated pipetters versus manual pipetting - Ongoing IT improvements aimed at reducing hands-on time, eliminating manual processes
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:	2009/10 results below established as be the baseline.
	Target:	2009 – 2013: maintain 98% compliance with service level standard
	Results (2009/10):	6 incidents of non-compliance with the communication requirements established in the lab testing and sampling protocols. 6 incidents affecting 7 of 397,387 sample sets (0.0015%) which meets the target of 98% compliance.

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.
	Target:	One Case study provided annually.
	Results (2009/10):	OMAFRA requested immediate development of quantitative identification of tetracycline and sulfa compounds in raw milk using LC-MS/MS technology. The two methods were successfully developed, and validated, ready for use in 12 weeks.
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 (2009/10):	• More than the forecasted number of requested samples in the Sampling & Testing Plan were submitted to and tested by the AFL • The AFL received 397,897 sample sets versus the forecasted 388,006 in the OMAFRA annual testing and sample plans.

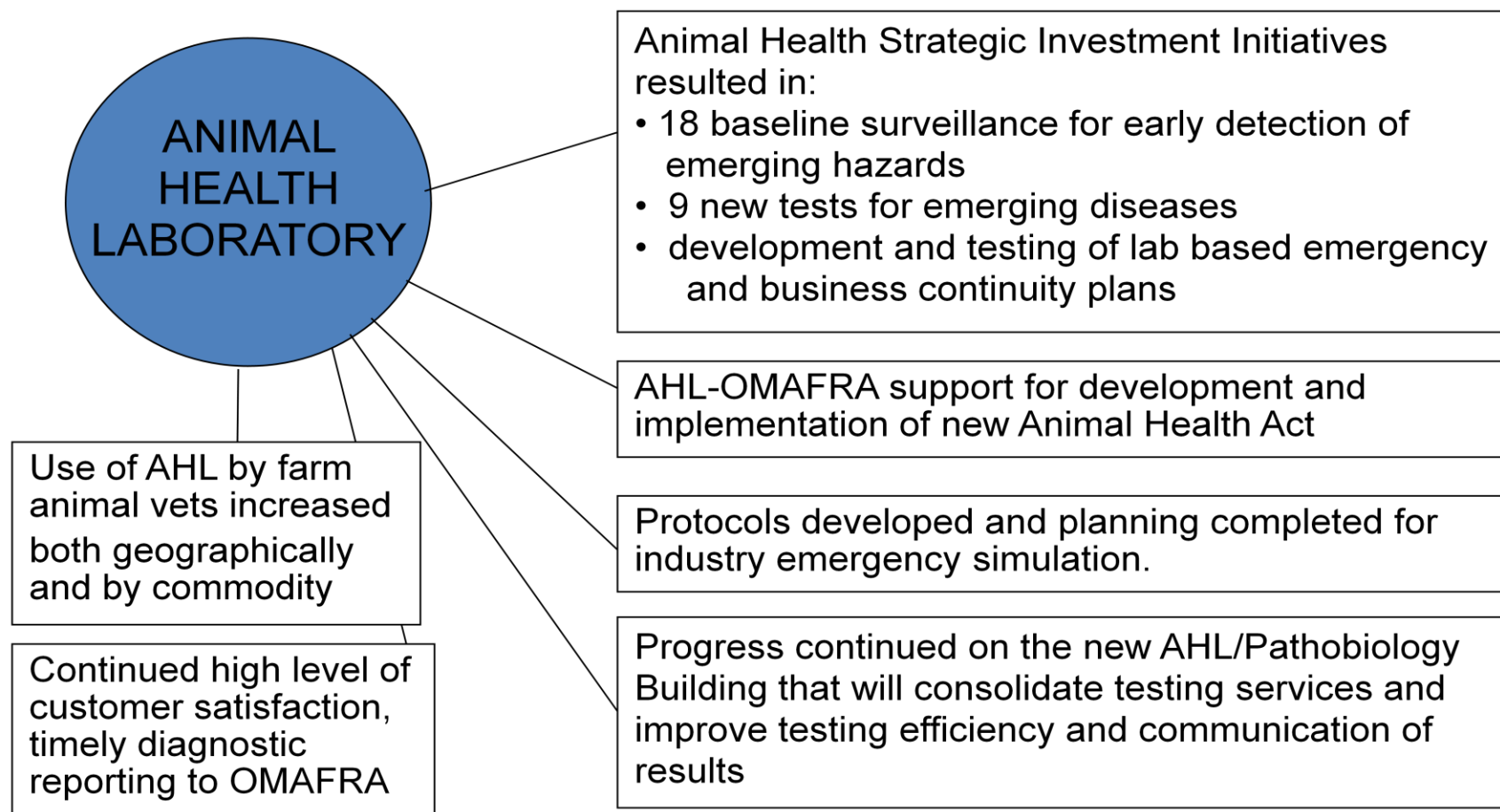
Key Outcome	Capacity to support coordinated and effective emergency management. Timely and effective response to unanticipated/urgent testing requirements and food safety, environmental health and plant health/pest emergencies.	
Performance Indicator AFL7	Effective response to food safety, environmental 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.
	Target:	Case study to be provided annually.
	Results (2009/10):	AFL met the expectation of OMAFRA in the timely delivery of testing under urgent circumstances during an unanticipated requirement for the development, validation and use of new test methods using LC-MS/MS technology for the identification and quantitation of tetracycline and sulfonamide compounds in raw milk.
Key Outcome	Improved UofG 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:	Due to a change in the metric, the 2009/10 results below establish the baseline.
	Target:	Demonstration of continued contribution by the AFL; fluctuation expected.
	Results (2009/10):	Eleven (11) papers/presentations were published 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 to be the baseline. four knowledge transfer events.
	Target:	2009 – 2013: maintain 2008/09 levels.
	Results (2009/10):	Seven (7) knowledge transfer events: • Five analytical microbiology workshops; approx 50 to 100 attendees at each. • Two analytical chemistry seminars regarding multi-residue detection of veterinary drugs; approx 50 to 100 attendees at each.

ANIMAL HEALTH LABORATORY

Selected Performance Indicators and Accomplishments

Program Objective: Surveillance, method development and emergency response and surge capacity in place 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 (2009/10):	7 of 17 AHL vets/supervisors participated in 59 meetings of 13 international and national organizations (total 290 hrs). 12 of 17 AHL vets/supervisors participated in 94 meetings of 17 provincial organizations (total 407 hrs).

		In total, all 17 AHL vets/supervisors participated on federal and/or provincial animal health strategy committees and 12 attended meetings or conferences for these committees in 2009/10. Average per staff member: 58 meeting hours per year spent on relevant committees, equivalent to 2.3% of available working time. <i>2.3% of available working time</i> is the same as the baseline, although the number of vets participating is different for 2009/10.
		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 has been 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). 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. 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 informs policy development. 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:	Baseline will be established in 2010/11.
	Target:	Establishment of target dependent on Animal Health Act.
	Results (2009/10):	Dependent on new capabilities potentially supported under the 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% } Average: 59% West Area Code 519: 66%
	Target:	2009-2013: ≥ 65% for each commodity; ≥ 60% for each region
	Results (2009/10):	<u>By Commodity</u> Proportion of EQ accredited facilities submitting EQ samples to the AHL = 169/241. Numerator: total number of accredited facilities with EQ submissions (whether or not they are identified as EQ accredited facilities in the CVO database) Denominator: total number of Ontario accredited facilities identified as EQ in the CVO database + all other accredited facilities which have submitted EQ samples to the AHL Proportion of FA accredited facilities submitting FA samples to the AHL = 168/222 Numerator: total number of accredited facilities with FA submissions (whether or not they are identified as FA accredited facilities in the CVO database) Denominator: total number of Ontario accredited facilities identified as FA in the CVO database + all other accredited facilities which have submitted FA samples to the AHL Equine (EQ) = 169/241 (70%) Food Animal (FA) = 168/222 (76%) <u>By Geographic Area (Area Code)</u> Proportion of EQ & FA accredited facilities in each area submitting EQ and/or FA samples to the AHL: Numerator: total number of accredited facilities with EQ and/or FA submissions (whether or not they are identified as EQ or FA accredited facilities in the CVO database) Denominator: total number of Ontario accredited facilities identified as EQ or FA in the CVO database + all other accredited facilities which have submitted EQ and/or FA samples to the AHL <u>By Geographic Area (Area Code)</u> North Area Code 705 = 38/53 (72%) } (Average: 67%) Area Code 807 = 1/5 (20%) }

		East Area Code 613 = 45/58 (78%) Central Area Code 416 = 6/10 (60%) } (Average: 58%) Area Code 905 = 47/81 (58%) } West Area Code 519 = 110/160 (69%)
		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. 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 (2009/10): <i>Question 5: Telephone enquiries are handled well.</i> 88% of respondents were delighted or pleased with how enquiries are handled while 10% described it as adequate (overall satisfaction rating of 98%). <i>Question 6: Email enquiries are handled well.</i> 90.5% of respondents were delighted or pleased with how enquiries are handled while 9.5% described it as adequate (overall satisfaction rating of 100%). <i>Question 12: Communication of relevant changes in disease occurrences is timely.</i> 96% clients responding to this survey question were satisfied with the timeliness of communication of relevant changes in disease occurrences. Analysis of results from yearly AHL client satisfaction survey questions 5, 6 and 12. Based on the above questions, 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 clients are satisfied.
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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 (2009/10):	The AHL selected three cases from their 2009/10 case work, with potential significance to animal health. The three cases were: 1) ILT virus, 2) pandemic H1N1 influenza A and 3) Chlamydiosis (Psittacosis) in an aviary. Evaluation of the three 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 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: For the three cases (and specifically for the H1N1case) reported: “In general I think they are accurate and complete descriptions and serve their purpose as Performance Indicators”.

	“The ILT case was done on a timely manner and all the communication process was done in an efficient way.” Recommendation: “During the past few years the communication of important diseases from AHL to OMAFRA has been changed a number of times and it is very essential to clarify a standard notification SOPs for future cases.” Communication trees and notifications procedures to support the AHA are being developed. “Results were communicated to the appropriate individuals and agencies in a timely manner.” For the Chlamydiosis case the OMAFRA reviewer had the following specific comments: “A gap described by Dr Marina Brash is related to lack of up to date diagnostic tests for this very important disease with zoonotic potential in Ontario. In many cases current tests are not conclusive (but in this case we were lucky that all tests came back positive). Having a good diagnostics that can work on live birds (feces) is important. For instance in this case, at the end of the treatment it was important to know if birds were still shedding the bacteria. We couldn’t because we don’t have the test. This methodology is available in US but not in Canada. We will have the next case sometime in the future a similar case could benefit from better diagnostic capabilities. “ <i>Each complete case description and narrative prepared by the AHL (along with the case evaluations by OMAFRA staff) is available upon request.</i>
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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 (2009/10):	ISO 9001 registration In January 2010, Laboratory Services (LS), including the AHL, successfully passed the recertification audit and continued our ISO 9001 registration. There were no non-conformances observed. The 2010 assessment report is available for on-site review. The next certification audits are scheduled for January 2011 and January 2012. BSI Management Systems is Laboratory Services' ISO 9001 assessor. American Association of Veterinary Laboratory Diagnosticians (AAVLD) accreditation AHL is accredited by AAVLD, meeting AAVLD accreditation requirements for full accreditation, all species. In April 2009 the AHL's quality system, test procedures and quality control activities were audited against the <i>AAVLD Essential Requirements for an Accredited Medical Diagnostic Laboratory</i>. This standard is based on the OIE's interpretation of the ISO/IEC 17025 standard for veterinary diagnostic laboratories. Four AAVLD auditors made recommendations, required actions and commendations. In February 2010 all required responses were accepted. AHL received full AAVLD accreditation, all species for a period of 5 years, 2010-2014. The 2009 assessment report is available for on-site review. The next AAVLD site visit will be in 2014.

	ISO/IEC 17025 accreditation Laboratory Services, including AHL, has tests accredited to the ISO/IEC 17025 standard by both of Canada's internationally recognized accrediting bodies, Standards Council of Canada (SCC) and the Canadian Association for Laboratory Accreditation (CALA). LS/AHL is accredited by SCC in the Agriculture Inputs, Food, Animal Health and Plant Protection program specialty area (PSA-AFAP). As of April 26, 2010, LS had 158 tests listed on the SCC scope of accreditation including 11 tests performed by the AHL. The 11 AHL SCC accredited tests are: 1. METALS-002 Mercury in Soils, and Tissues by Cold Vapour AAS 2. MOL-180 Real-Time scrapie resistance PrP genotyping. 3. SNL-058 Water extractable sodium from feed 4. TOXI-013 Liquid chromatographic determination of monensin, narasin and salinomycin in feeds using post-column derivatization 5. TOXI-023 Fluorometric Determination of Selenium in Biological Material 6. TOXI-024 Metals in Biological Material by ICP-OES 7. TOXI-032 Lead determination in maple syrup products, honey and apple cider/juice 8. TOXI-047 Determination of Lasalocid in Animal Feeds and Premixes by Reverse Phase Liquid Chromatography 9. TOXI-061 Determination of trichothecene mycotoxins by gas chromatography with ion-trap mass spectrometer detection using acetonitrile chemical ionization 10. TOXI-064 ICP-MS analysis of metals in food 11. TOXI-068 VICAM AOZ HPLC (Aflatoxin, Ochratoxin, Zearalenone) LS/AHL is accredited by CALA for environmental testing. As of April 30, 2010, LS had 16 environmental listings on the CALA scope of accreditation including 4 tests performed by AHL (SNL/TOXI). In September 2009, a joint CALA/SCC assessment reviewed LS/AHL's quality system and accredited methods and reported on their observations, required responses and commendations. LS/AHL submitted their CALA and SCC required responses within 45 days meeting the required response times of 45 and 90 days respectively). The assessment reports are available for on-site viewing. The accrediting bodies require a biennial assessment of the quality system and tests listed on the scope of accreditation. The next SCC and CALA biennial assessment will be the fall of 2011.
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		Canadian Food Inspection Agency (CFIA) accreditation AHL is accredited by the CFIA – Retrovirology Centre for Expertise for Equine Infectious Anemia (EIA). On April 28-29th, 2010, a CFIA inspector reviewed AHL’s quality program and EIA test procedure and reported on some recommendations, required responses and commendations. The report is available for on-site viewing. AHL’s required responses have been entered in Lab Track and are due to CFIA June 7, 2010. The next EIA assessment will be in 2012. Assessment of the ISO 9001 quality management system follows a 3-year cycle. Every 3 years, there is a recertification audit covering all components of the ISO 9001 standard. In the intervening years, there are ongoing certification audits covering selected sections of the standard and operation. AHL is accredited by AAVLD, meeting AAVLD accreditation requirements for full accreditation, all species. Laboratory Services, including AHL, has tests accredited to the ISO/IEC 17025 standard by both of Canada’s internationally recognized accrediting bodies, Standards Council of Canada (SCC) and the Canadian Association for Laboratory Accreditation (CALA). LS/AHL is accredited by SCC in the Agriculture Inputs, Food, Animal Health and Plant Protection program specialty area (PSA-AFAP).						
	Baseline / Target / Results(b/c)	<table><tr><th>Target 2009-2013</th><th>Baseline 2008/09</th><th>Results 2009/10</th></tr><tr><td>≥ 90% satisfaction rating</td><td>96% satisfaction rating</td><td>99% satisfaction rating</td></tr></table>	Target 2009-2013	Baseline 2008/09	Results 2009/10	≥ 90% satisfaction rating	96% satisfaction rating	99% satisfaction rating
Target 2009-2013	Baseline 2008/09	Results 2009/10						
≥ 90% satisfaction rating	96% satisfaction rating	99% satisfaction rating						
	Results (2009/10):	<i>Question 1:</i> Employees respond in a timely manner <i>Question 4:</i> Published turn-around times are met 100 of 102 (98%) clients responding to the survey were satisfied with the timeliness of employee response, and 95 of 95 (100%) clients responding to the survey were satisfied that published turn-around times were met. The actual adherence to published turnaround times was 81.6%						

		Turnaround time is one of the most critical measures of a laboratory's effectiveness and efficiency. Customer 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. The AHL has done this by proactively measuring and analyzing their TAT performance to identify areas needing continuous improvement. A component of the recent accreditation of the AHL by the AAVLD is an analysis of the adherence to quoted TAT expectations as published in the AHL User's Guide and Fee Schedule. Access to this information has been provided by the AHL Director for further analysis. Lastly, client access to the AHL Client Services Vet is seen as a very positive component of improved customer service. Several comments on the survey specifically thanked staff in Specimen Reception for their helpfulness and professionalism (e.g., "Kudos to Robin, Rina and others who answer phones and serve clients - they are the best, polite, informative, caring".) However, not all clients are satisfied: "The most common critical comments regard the handling of stat samples, which is nothing new. Response time is felt to not be fast enough at times, and transfer time from specimen reception to the relevant laboratory is perceived as often being the rate-limiting step." Based on reporting of test results, data and TATs, clients were asked to rate the comments above 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(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 (2009/10):	In 2009/10 AHL reported 50 biological results or panels and 100% are satisfactory. The table below summarizes the biological proficiency results.

Proficiency program	Parameter	Scoring criteria	Results reported	Pass
USDA Johnes proficiency	Johnes diagnosis	Agree with consensus diagnosis	3	3
CFIA- BSE	BSE panel	Panel passes	3	3
CFIA-CWD	CWD panel - certified analysts	Analyst passes panel	3	3
CFIA EIA	EIA panel - certified analysts	Analyst passes panel	6	6
CFIA AIV AGID	AIV AGID panel	Panel passes	2	2
ILS - <i>Leptospira</i>	<i>Leptospira</i> panel	Panel passes	1	1
Boehringer-Ingelheim	PRRSV & PCV-2	Panel passes	8	8
VLA-QAP parasitology	Parasite identification	Agrees with consensus ID	4	4
VLA- Histopathology module	Disease diagnosis	Agrees with consensus ID	2	2
CFIA Scrapie panel exchange	Scrapie genotype	Agree with reference lab (CFIA)	10	10
CFIA-FMD 3ABC ELISAD	certified analysts pass panel	Certified analyst pass panel	4	4
CFIA CSF real-time PCR	certified analysts pass panel	Certified analyst pass panel	2	2
CFIA FMD RRT-PCR	certified analysts pass panel	Certified analyst pass panel	2	2
Biological PT			50	50
2009/10				100%

In 2009/10 the chemical sections of AHL, Clinical Pathology and Toxicology/ Soil & Nutrient, participated in 25 PT programs.

		In 2009/10, AHL reported over 2800 chemical PT results and the results summary: 1. satisfactory 90.3% 2. questionable 4.0% 3. unsatisfactory 5.6%
		AHL participated in 38 proficiency test programs in 2009/10. 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 numerical results and the results are usually categorized as satisfactory, questionable and unsatisfactory. When a PT result is identified as questionable or unsatisfactory, the problem was investigated, corrective action applied and documented. A summary of chemical PT results is available for onsite review. The reported 2009/10 AHL PT results (satisfactory plus questionable) being less than 95% (94.3%) requires some clarification. Unsatisfactory results were skewed by 2 instances related to 3 samples. These accounted for 64 out of 158 unacceptable results (41% of unacceptable results).
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 (2009/10):	<i>Question 8: Test results assist in problem solving.</i> 85% of respondents were delighted or pleased with this category while another 14% described it as adequate (overall satisfaction rating of 99%).

		<i>Question 13: The services provided by AHL meet my organization's needs</i> 93% of clients were delighted or pleased with the services while 7% described them as adequate (overall satisfaction rating of 100%). <i>Question 15: What has been your average overall level of satisfaction with service from the AHL?</i> 87% of clients were delighted or pleased with the services while 11% described them as adequate (overall satisfaction rating of 98%). <i>Question 17: Will you continue to use the services of the AHL?</i> <i>Question 18: Would you recommend the AHL to others?</i> 99% of clients responded YES to the above two questions. Overall, the average satisfaction rating for the above questions was 99%.
		Client responses (as above) show an across-the-board high level of satisfaction with AHL services; however, there are still some areas for improvement, some of which were identified by clients in Question 28. For example the following comment could likely be considered representative of a number of current AHL clients: <i>"More suggestions (assistance) with interpretation of test results either sent with actual results of each submission or in frequently updated booklet form or pages that can be saved if so desired---could be specific species directed."</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/UofG Agreement (Note: it was felt that this PI would be better served by using this new metric.)
	Baseline:	Year 2 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 (2009/10):	Why a Poultry Industry Disease Simulation? A Poultry Industry Disease Simulation initiative was prepared in order to test the poultry industry preparedness and response efficiency in case of a serious disease outbreak. This simulation exercise will test the existing industry's emergency preparedness protocols as well as the inter-organizational coordination and communication effectiveness crucial in case of serious disease outbreak. A 'lessons learned' report will be shared with poultry industry leaders for educational and continuous improvement purposes. Objective The Canadian/Ontario food animal industry is in constant risk of a contagious animal disease outbreak. Hence all commodity groups have a shared responsibility to develop Crisis Management Plans and exercise effective collaboration and communication strategy to ensure effective response during a crisis. The industry role in this exercise is: • to test its readiness to deal with an animal disease outbreak • to decrease emergency response time and recovery time • to promote the early on-farm self-declaration during a potential disease outbreak. Attendees Feather Board Command Centre (FBCC) was formed of four poultry boards. Its role in this initiative is to evaluate their compliance with existing emergency response procedures and improve the efficiency of the emergency response plan as FBCC will lead the first-line response during an authentic contagious animal disease outbreak. Contact with field activities and other stakeholders will also be evaluated. ARMII, a not-for-profit Corporation, will deliver boxes containing 24 sets of personal protective equipment (PPE) during the simulation. The goal for ARMII is to examine their PPE delivery efficiency to multiple "outbreak" locations in a timely manner. Delivery to Stayner and Moorefield areas will be exercised. Additionally, farmers will have an opportunity to practice the donning and doffing procedure using provided PPE. Protocols and forms have been developed by OMAFRA to manage their response to a disease outbreak. OMAFRA's response to a farm in the Stayner area will be evaluated. CFIA will test their sampling procedure and potential results distribution efficiency. CFIA's role during an authentic disease outbreak will be to lead the response and specimen testing.
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		Animal Health Laboratory (AHL) will assist with training of private poultry veterinarians and FBCC field staff to collect and submit field samples to AHL, as well as testing specimen submission and testing logistics. Observers (OnTrace, Ontario Independent Meat Processors, Ontario Pork Industry Council, Municipal Emergency Response Coordinator, Turkey Division Maple Leaf) Other participants (Association of Ontario Chicken Processors, Poultry Services Association, Ontario Association of Poultry Practitioners, Ontario Agri-Business Association, Ontario Livestock and Poultry Council, Ontario Hatchery Association, Ontario Independent Poultry Processors) Poultry Industry Disease Simulation exercise – June 14-17, 2010. Scenario will unfold to accommodate inclusion and exit of government authorities and to mimic outbreak progression scenario over an extended period of time. Design team developed a disease-outbreak scenario based on protocols from each participating group. A non-reportable disease has been chosen for the purpose of this exercise. Main activities will occur in one provincial zone (Moorefield, Ontario) with at least one farm from each commodity being involved in the simulation process. A second zone will be identified to test efficient delivery of ARMI supplies to two different zones simultaneously. The AHL will test approximately 200 samples in one day, collected from 8 farms prior to the actual simulation dates. The samples will be stored until the simulation date, at which time they were officially “submitted” into the AHL’s system. Surge capacity (all 1200 samples in one day, with results being released the next day) will be tested in Winter 2010 subsequent to AHL’s relocation to the new facilities in September/October 2010.
		Year 2 milestones continued with a business services risk assessment and notification drill. This exercise will be performed jointly with the AFL in August/September 2010. Since the AHL will be moving to a new building in September/October 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 (2009/10):	<i>Question 14: Animal Health Lab uses AHL Newsletters, LabNotes and our website as well as meeting updates, scientific publications, and personal email and telephone consultation for knowledge transfer to veterinarians. These were ranked in their effectiveness: 5=very effective, 1=not effective.</i> The majority of clients are aware of and use both the AHL Newsletter and LabNotes. 93% of respondents make some use of these with > 90% finding them effective. A significantly smaller number of clients are aware of or use the AHL website while effectiveness of meeting updates and use of scientific publications was much less, i.e. < 50%. Overall, the satisfaction rating for this question was 93%. It is notable that approximately 40% of clients did not respond to this question on the use or effectiveness of knowledge transfer products from the AHL. <i>Question 20: Do you receive sufficient information on testing services that are available from the AHL?</i> 84% of respondents said YES and 16% said NO. Overall, the satisfaction rating for this question was 84%.
		Knowledge transfer from the AHL to clients and partners occurs via in-person discussions, newsletters, contributions of scientific articles, and peer-reviewed publications. In 2008/09 the survey was sent to 193 clients with a response rate of 34 % (66 clients). In 2009/10 the survey was sent to 480 clients resulting in the response rate of 25% (119 completed responses). As a result, AHL was able to access a larger group of respondents including some new/different clients. Therefore, the percentage of clients who did not respond to question 14 may

not be aware of the potential for using the AHL website to gain information.

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.

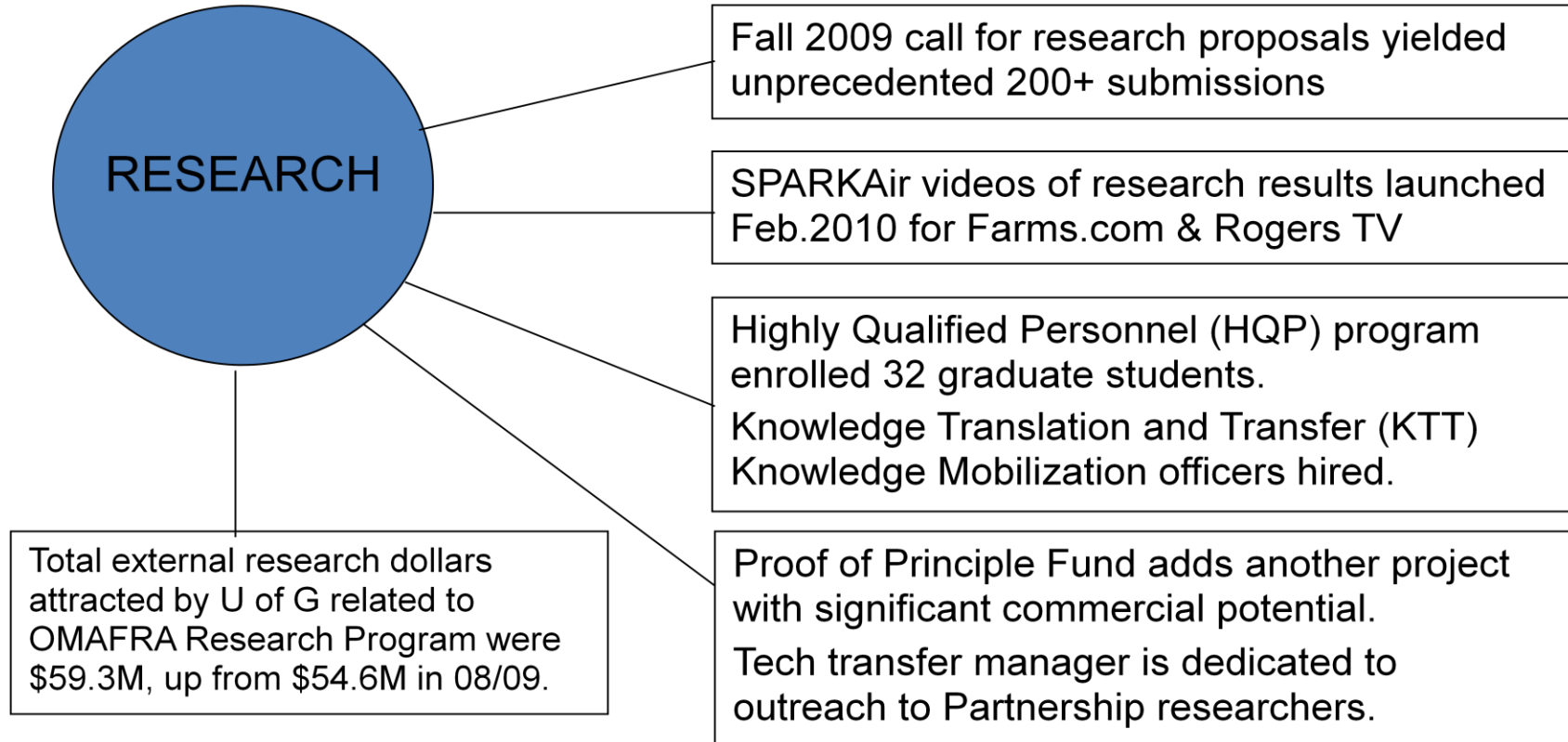
As a matter of course, the AHL has added many new testing methodologies and tests such as polymerase chain reaction (PCR), gene sequencing, immunohistochemistry (IHC), which are presented in the AHL Newsletter. The AHL also produces a series of "LabNotes" for more in-depth analysis of current topics, e.g., understanding and selecting tests for BVDV.

Finally, AHL staff contributes to a number of peer-reviewed scientific publications every year. 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.

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 UofG's capacity and mobilize the province's unique competitive strengths.	
Performance Indicator R1 a)	Comparison of actual versus planned OMAFRA/ UofG Research Program spending, in total, and in each of the research theme areas.	
	Metric (a-i)	Annual actual dollars in the OMAFRA/UofG 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,
	Target:	2009-13: Ratio of actual to planned dollars spent of 1:1.
	Results (2009/10):	See table below.

Projects Active in 2009/2010

Theme	Ag & Rural Policy	Bioeconomy	Emerg Mgmt	Env Sust	Food	Prod Dev	Prod Syst I and II	Total
Active Projects Commitments: Operating in 09/10	709,290	489,341	271,250	752,209	576,370	534,608	2,388,068	5,721,136
Committed for Future years (10/11; 11/12)	420,580	750,625	135,000	813,555	831,230	603,027	1,742,528	5,296,545
Total Committed	1,129,870	1,239,966	406,250	1,565,764	1,407,600	1,137,635	4,130,596	11,017,681
Total Value Projects Funded 08/09	281,500	677,000	8000	580,056	349,000	658,100	1,515,050	4,068,706
Total Committed to date (May 1/08 – April 30/13)	1,411,370	1,916,966	414,250	2,145,820	1,756,600	1,795,735	5,645,646	15,086,387
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
Uncommitted Dollars (< > overcommitted)	188, 630	83,034	585,750	<145,850>	243,400	4,265	<845,646>	113, 583
Faculty Value	495,679	286,056	347,425	777,962	552,585	504,664	5,270, 522	8,234,893
Research technician value	0	64,225	46,879	293,190	18,439	65,048	2,297,190	2,784,971
Projects Active in 2010/2011								
Theme	Ag & Rural Policy	Bioeconomy	Emerg Mgmt	Env Sust	Food	Prod Dev	Prod Syst I	Total
Project Commitments: Operating in 10/11	727,911	1,060,506	420,449	1,039,239	1,083,311	666,199	1,987,817	6,985,432
Committed for Future years (11/12; 12/13)	1,108,974	1,379,763	495,192	1,031,869	1,579,417	803,681	2,313,742	8,712,638
Total Committed	1,836,885	2,440,269	915,641	2,071,108	2,662,728	1,469,880	4,301,559	15,698,070
Total Committed to date (May 1/08 – April 30/13)	2,827,675	3,606,610	1,194,891	3,403,373	3,588,098	2,662,588	8,204,677	25,487,912
Total Planned Dollars (May 1/08 – April 30/13)	4,000,000	5,000,000	2,500,000	5,000,000	5,000,000	4,500,000	12,000,000	38,000,000
Current Uncommitted Dollars	1,172,325	1,393,390	1, 305,109	1,596,627	1,411,902	1,837,412	3,795,323	12,512,088

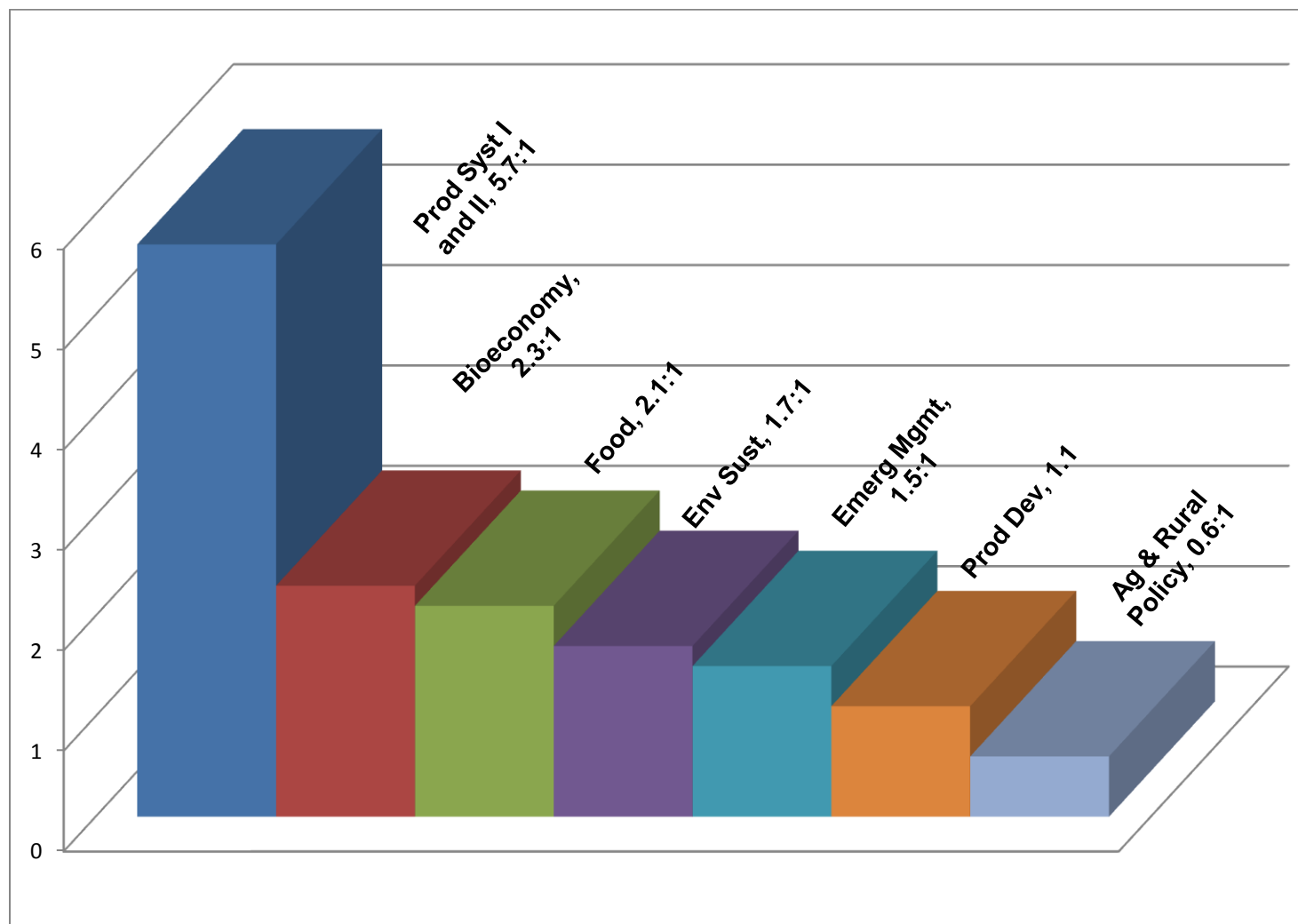
	Metric (a-ii)	Total number of projects funded in each theme area through peer review and advisory committee, compared to the number of letters of intent and proposals received (i.e., level of demand for funding) in each theme area.								
	Baseline:	The number of letters of intent (LOIs) and projects 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 (2009/10):									
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 Tier II	Total	
Number of funded projects (incl. continuing)	19	10	12	19	10	10	38	51	160***	
Number of LOIs*	0	0	0	0	0	0	0	0	0	
Number of Proposals **	23	13	15	22	18	20	53	17	130**	
Number of proposal funded ***	12	5	11	8	6	6	26	17	65***	
* The LOI process was skipped in this call and only proposals were reviewed										
** Some proposals were reviewed under more than one theme										
*** Some proposals were funded under more than one theme										

2010/2011									
Theme	Ag & Rural Policy	Bioeconomy	Emerg Mgmt	Env Sust	Food	Prod Dev	Prod Syst I	Prod Syst II	Total
Number of funded projects	20	17	15	30	24	15	51	54	207***
Number of LOIs***	25	20	14	34	36	29	106	0	203***
Number of Proposals****	15	9	9	17	16	14	56	29	112***
Number of proposals funded	12	9	9	12	11	7	23	28	100***
**** Some LOIs and proposals were reviewed and funded 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) operating funds, 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 ≥ 2008/09 baselines.							
	Results (2009/10):	Ratio of 3.2:1 third party investment to Agreement funding (ranging from 0.6:1 in Ag & Rural Policy to 5.7:1 in Production Systems). Total amount of third party investment - \$18.6m. Note: Seven large Prod. Syst. projects, ending April 30, 2010, contributed \$8,608,703 of leveraged funds towards the total \$13.5m for the theme. As these projects are now completed it is expected the level of third party funding will decrease for 2010/11. Ratio is based on Actual Project Funding of \$5,721,136 from R1(a-i)							

2009/10 Theme	Ag & Rural Policy	Bioeconomy	Emerg Mgmt	Env Sust	Food	Prod Dev	Prod Syst I and II		Total
Cash and in-kind	466,379	1,103,453	406,720	1,304,577	1,217,062	559,929	13,527,734		18,585,854
Ratio of Third Party-Investment to OMAFRA	0.6:1	2.3:1	1.5:1	1.7:1	2.1:1	1:1	5.7:1		3.2:1
2008/09 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	782,324	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 (2009/10):	2009/10 results: \$59.3 million.

Fiscal Year	Total UofG Research Funding (' 000) (Note 1)	Total OMAFRA Partnership Research Funding ('000) see Financial Table pg 40	Funding Leveraged from OMAFRA Agreement					Ratio
			Total Funding from All Sources (Est. ' 000)	Breakdown by Source (Note 2)				
				Federal	OMAFRA	Other Provincial	Business / Industry / Private / Other	
2009/2010	158,954	50,604	59,326	27,765	3,354	10,190	18,018	(59.3:50.6) 1.2:1
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: **"Funding Leveraged from OMAFRA Contract"** (thousands of \$) is the total of all individual research project awards from all sources other than the OMAFRA/UofG Agreement for projects (across all UofG Departments/researchers) which support the objectives of OMAFRA's research priorities. **"Total UofG Research Funding"** is the total of all research projects (including OMAFRA/UofG Agreement projects), regardless of whether or not they support OMAFRA's priorities.

Note 2: **"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, 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 ≥ 2008/09 levels.			
	Results (2009/10):	Total number of Active Projects: 160* 2009/10 <u>Number of Active Projects by Theme</u> Agricultural and Rural Policy: 19 Bioeconomy – Industrial Uses: 10 Emergency Management: 12 Environmental Sustainability: 19 Food for Health: 10 Product Development: 10 Production Systems I: 38 Production Systems II: 51 *9 projects are funded in more than one theme See Table R1 (d-ii) page 103 for a complete listing of projects		Results Total number of Active Projects: 92 (2008/09) <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 * one project funded by RPD discretionary fund	
	Metric (e)	Level of utilization of research stations.			
	Baseline:	Established based on 2008/09 data. 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 ≥ 2008/09 levels.			
	Results (2009/10):	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 OMAFRA / UofG Projects		Percentage of utilization- (note this includes all research not just OMAFRA / UofG projects)		\$ value of research station usage	
	2009/10	2008/09	2009/10	2008/09	2009/10	2008/09
Arkell Poultry	11	13	30.3	10.2	387,836	530,671
Arkell Swine	9	8	4.6	7.0	127,012	176,591
Arkell Equine	4	7	16.0	34.5	99,000	180,000
Elora/Ponsonby Dairy	12	8	5.2	8.6	47,571	134,103
Elora Beef	4	3	85.0	76.5	1,146,634	1,115,761
Ponsonby Sheep	4	4	11.3	36.4	77,260	140,746
Ponsonby General * Sheep	4	11	100	100	73,507	143,692
*Note this research station does not maintain a resident herd/flock so all animals are used for research Cattle	4	0	100	100	66,117	59,707
Swine	0	0	0	100		
Alma Aquaculture		0				
(in tank days) Tanks	5		22.0	19.5	96,635	34,499
Alfred Dairy	0	4	18.0	16.1	21,835	23,742
Kemptville Dairy	3	2	51.9	43.3	88,954	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	3	2	60.0	Not available	229,457	Not available

Crop Research Station	Number of OMAFRA/UofG Projects		Percentage of utilization- note this includes all research not just OMAFRA/UofG projects		\$ value of research station usage	
	2009/10	2008/09	2009/10	2008/09	2009/10	2008/09
Arkell Crops	3	2	100	100	3,046	2,566
Elora Crops	17	18	38.5	37.7	242,137	168,100
Alfred Crops	1	4	66.0	100	31,680	28,800
NLARS Crops	1	3	100	100	41,015	11,319
Emo Crops	3	1	100	100	81,067	81,000
Ridgetown Crops	12	13	81.0	29.4	238,495	103,407
Kemptville Crops	3	4	100	92.6	101,710	103,500
Simcoe	7	7	36.4	29.1	187,945	176,591
Vineland	6	6	14.0	14.0	109,788	117,641
Guelph Turfgrass	10	7	52.4	39.4	61,848	66,560
Bradford Muck Crops	2	2	100	26.3	131,524	56,008
Woodstock Crops	6	4	11.5	12.6	61,563	57,256
Total	134	133			3,753,636	\$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/UofG 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:	Established at 128 Faculty Research FTEs	
	Target:	2009-13: Number of FTEs to be ≥ 2008/09 baseline.	
	Results (2009/10):	2009/10 Results: 115 Faculty Research FTEs	
	Research / Researcher Awards supportive of OMAFRA priorities		
	No. of Researchers engaged in research supportive of OMAFRA priorities	"Faculty Research FTEs" focused on OMAFRA-related priorities (Note 1)	No. of OMAFRA-Supportive Research Awards (outside the OMAFRA/ UofG Partnership)
2009/10 Total:	265	115	737
2008/09 Total	280	128	852
"Research FTE" (Research Full Time Equivalent) should not be confused with faculty FTE. Each faculty member has a defined "Distribution of Effort" apportioning their full FTE to 'research', 'teaching' and 'service'. In some departments (i.e., CA, CSAHS) the majority of faculty may have a relatively low 'Research DOE' (therefore low Research FTE, say 0.25), whereas in some other Colleges/Departments (i.e., OAC, OVC) a greater number of faculty may have a much higher 'Research DOE' (therefore a higher Research FTE, perhaps 0.5 or 0.6). Note 1: 'Portion of "Research FTE" focused on OMAFRA-related priorities' is estimated for each researcher based on the value of their OMAFRA-supportive research awards received as a portion of their total research awards received. These individual research FTE portions were averaged across those faculty with some portion of their research time engaged on OMAFRA Supportive Research project(s). 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 265 faculty members engaged in research supportive of OMAFRA priorities actually contribute an estimated 115 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 (based on 2008/09 projects) and provided to OMAFRA.			

	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 (2009/10):	Number of faculty FTEs specifically allocated to OMAFRA Partnership research projects: Total: 55.32. This number includes HQP Director at 0.30 and Bredahl KTT project at 0.15 (these are not included below). <u>By theme:</u> <table><tr><td>Agricultural and Rural Policy:</td><td>3.31</td></tr><tr><td>Bioeconomy – Industrial Uses:</td><td>1.79</td></tr><tr><td>Emergency Management:</td><td>2.32</td></tr><tr><td>Environmental Sustainability:</td><td>5.20</td></tr><tr><td>Food for Health:</td><td>3.69</td></tr><tr><td>Product Development:</td><td>3.37</td></tr><tr><td>Production Systems I:</td><td>22.81</td></tr><tr><td>Production Systems II:</td><td>12.38</td></tr></table> Number of faculty FTEs engaged in projects supportive of OMAFRA priorities (but not allocated to approved OMAFRA Partnership projects) is estimated at 115 FTEs (see Metric R2a).	Agricultural and Rural Policy:	3.31	Bioeconomy – Industrial Uses:	1.79	Emergency Management:	2.32	Environmental Sustainability:	5.20	Food for Health:	3.69	Product Development:	3.37	Production Systems I:	22.81	Production Systems II:
Agricultural and Rural Policy:	3.31																
Bioeconomy – Industrial Uses:	1.79																
Emergency Management:	2.32																
Environmental Sustainability:	5.20																
Food for Health:	3.69																
Product Development:	3.37																
Production Systems I:	22.81																
Production Systems II:	12.38																
	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:	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 (2009/10):	Total number of research personnel FTEs: 120.75 <u>Research Personnel FTEs by theme</u> Agricultural and Rural Policy: 14.13 Bioeconomy – Industrial Uses: 5.00 Emergency Management: 7.50 Environmental Sustainability: 10.01 Food for Health: 15.85 Product Development: 7.38 Production Systems I: 18.18 Production Systems II: 42.70
	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.
	Results (2009/10):	Total number of Faculty, CARG & Research Personnel FTEs: 188.98 <u>Total FTEs by theme</u> Agricultural and Rural Policy: 20.89 Bioeconomy – Industrial Uses: 7.69 Emergency Management: 9.82 Environmental Sustainability: 18.65 Food for Health: 19.54 Product Development: 10.75 Production Systems I: 44.93 Production Systems II: 56.71

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:	2008/09 results to be the baseline. Same as OA1 metric c) 2008/09, 25 UofG faculty members were Canada Research Chair holders, of which 10 had active OMAFRA Research projects.
	Target:	2009-13: Recognition as indicated by awards, appointments etc. to be $\geq$ 2008/09.
	Results (2009/10):	During 2009/10, 30 faculty members at the UofG were Canada Research Chair holders, of which 6 had active OMAFRA Research projects.
	Metric (b)	UofG'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 (2009) rankings put UofG in second place among Canadian 'comprehensive' universities. Same as OA1 metric a)
	Target:	2009-13: UofG's ranking to be second or better among comprehensive universities in Canada.
	Results (2009/10):	Research Money Inc.'s most current (2009) rankings put UofG in second place among Canadian 'comprehensive' universities. The 2010 results will be available October 2010 and will be reported in the 2010/11 Annual Report.
	Metric (c)	Number of faculty who publish in high impact journals.
	Baseline:	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 (2009/10):	Total number of faculty published in high impact journals: 88 <u>Faculty by theme</u> Agricultural and Rural Policy: 2 Bioeconomy – Industrial Uses: 3 Emergency Management: 2 Environmental Sustainability: 5 Food for Health: 1 Product Development: 0 Production Systems I & II: 75
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.
	Target:	2009-13: adequate representation of stakeholders on advisory committees, as achieved in 2008/09.
	Results (2009/10):	

Theme	Ag & Rural Policy		Bioeconomy		Emerg Mgmt		Env Sust		Food		Prod Dev		Prod Syst - Livestock		Prod Syst - Plants	
	LOI	FP	LOI	FP	LOI	FP	LOI	FP	LOI	FP	LOI	FP	LOI	FP	LOI	FP
Research /Scientific	3	4	3	3	3	3	4	4	4	4	2	3	5	5	5	4
OMAFRA / Gov't	3	4	2	2	3	4	3	3	3	3**	3	3**	3	3	3	3
User Community / Industry / Non-Gov't	3	2	2	4	1*	2	1*	1*	2	3	4	3	2	2	2	2
Total	9	10	7	9	7	9	8	10	9	10	9	9	10	10	10	9
LOI – Letters of Intent FP – Full Proposals * 2 Accepted; however, only 1 participated **4 Accepted; however, only 3 participated																

	Metric (b)	Total number of publications in peer reviewed journals and % of those appearing in high impact journals (as tracked).																																	
	Baseline:	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 (2009/10):	Total number published in peer reviewed journals: 238. Total percentage in high impact journals: 53% <u>Peer Reviewed Journals by Theme & Ratio in High Impact</u> Agricultural and Rural Policy: 3 – 66% Bioeconomy – Industrial Uses: 3 – 66% Emergency Management: 2 – 50% Environmental Sustainability: 9 – 89% Food for Health: 5 – 20% Product Development: 1 – 0% Production Systems I & II: 215 - 59%																																	
	Metric (c)	Number of collaborations and/or partnerships with external institutions.																																	
	Baseline:	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 (2009/10):	i) Total number of collaborators for projects active in 2009/10 and previous fiscal years: 203 ii) Total number of collaborators for active projects approved in 2009/10:167 <table><tr><td colspan="2"><u>Collaborators by theme: i)</u></td><td colspan="2"><u>Collaborators by theme: ii)</u></td></tr><tr><td>Agricultural and Rural Policy:</td><td>8</td><td>28 (includes 11 OMAFRA staff)</td><td></td></tr><tr><td>Bioeconomy – Industrial Uses:</td><td>6</td><td>17 (includes 4 OMAFRA staff)</td><td></td></tr><tr><td>Emergency Management:</td><td>0</td><td>6 (includes 1 OMAFRA staff)</td><td></td></tr><tr><td>Environmental Sustainability:</td><td>32 (includes 9 OMAFRA staff)</td><td>23 (includes 7 OMAFRA staff)</td><td></td></tr><tr><td>Food for Health:</td><td>3</td><td>15 (includes 2 OMAFRA staff)</td><td></td></tr><tr><td>Product Development:</td><td>4</td><td>8</td><td></td></tr><tr><td>Production Systems I & II:</td><td>150 (includes 26 OMAFRA staff)</td><td>70 (includes 16 OMAFRA staff)</td><td></td></tr></table>		<u>Collaborators by theme: i)</u>		<u>Collaborators by theme: ii)</u>		Agricultural and Rural Policy:	8	28 (includes 11 OMAFRA staff)		Bioeconomy – Industrial Uses:	6	17 (includes 4 OMAFRA staff)		Emergency Management:	0	6 (includes 1 OMAFRA staff)		Environmental Sustainability:	32 (includes 9 OMAFRA staff)	23 (includes 7 OMAFRA staff)		Food for Health:	3	15 (includes 2 OMAFRA staff)		Product Development:	4	8		Production Systems I & II:	150 (includes 26 OMAFRA staff)	70 (includes 16 OMAFRA staff)	
<u>Collaborators by theme: i)</u>		<u>Collaborators by theme: ii)</u>																																	
Agricultural and Rural Policy:	8	28 (includes 11 OMAFRA staff)																																	
Bioeconomy – Industrial Uses:	6	17 (includes 4 OMAFRA staff)																																	
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Food for Health:	3	15 (includes 2 OMAFRA staff)																																	
Product Development:	4	8																																	
Production Systems I & II:	150 (includes 26 OMAFRA staff)	70 (includes 16 OMAFRA staff)																																	
	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																																	

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:	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 (2009/10):	One case study is provided for each theme (two for Production Systems – livestock and crops) and included in the Program Highlight Section – pages 13-29.
Key Outcome	Highly skilled UofG graduates meet changing workforce demands	
Performance Indicator R6	Level of engagement of University graduate students in OMAFRA/UofG research projects.	
	Metric (a)	Total number of graduate students working on research projects related to each theme areas, under the Partnership.
	Baseline:	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 (2009/10):	Total number of Graduate Students: 101 <u>Graduate Students by theme</u> Agricultural and Rural Policy: 21.0 Bioeconomy – Industrial Uses: 0.5 Emergency Management: 5.0

		Environmental Sustainability: 4.5 Food for Health: 8.0 Product Development: 5.0 Production Systems I & II: 57.0
	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:	Target to be based on 2009-2010 student enrolment which was 32.
	Results (2009/10):	32 graduate students were enrolled in the first year of the HQP program.
	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:	2012-2013 will be baseline year.
	Results (2009/10):	Not available for 2009/10; 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 ≥ 2008/09 baseline.
	Results (2009/10):	

	Ag & Rural Policy		Bioeconomy		Emerg Mgmt		Env Sust		Food		Prod Dev		Prod Syst I & II		Total	
	09/10	08/09	09/10	08/09	09/10	08/09	09/10	08/09	09/10	08/09	09/10	08/09	09/10	08/09	09/10	08/09
Peer-reviewed journal publications	3	6	3	8	2	0	9	6	5	17	14	10	144	215	180	265
Presentations at scientific conferences,	11	5	23	3	4	2	37	13	11	6	8	8	288	78	382	115
Articles published in the public press	12	34	7	42	16	0	10	6	1	3	2	2	100	205	148	291
New presentations posted on the internet	6	4	4	1	8	0	1	0	0	1	0	4	24	5	43	11
Presentations to stakeholder or industry	14	41	30	25	18	5	65	5	11	16	3	0	239	236	380	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 (2009/10):	Example of 2009/10 research yielding new knowledge being used by stakeholders: • Prof. Erickson's Project: November 2009 Ford Motor Company used the world's first wheat/plastic composite car part, an interior sidebin in the Ford Flex, manufactured in Oakville, Ontario.
	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 (2009/10):	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 (2009/10):	See R1, metric b)

Key Outcome	Research results commercialized	
Performance Indicator R8	Patents, products (<i>technologies, software, germplasm, registered trademarks, copyright</i>), 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 Property Committee.	
	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 (2009/10):	Total number of OMAFRA related disclosures: 121 <u>Disclosures by theme</u> Agricultural and Rural Policy: 0 Bioeconomy – Industrial Uses: 1 Emergency Management: 0 Environmental Sustainability: 1 Food for Health: 2 Product Development: 1 Production Systems (Animal): 16 Production Systems (Crops): 100 Note: Fluctuation in disclosure numbers is due primarily to fluctuation in the number of seed varieties that have been disclosed. For example, in the 2008/09 fiscal year, there was a disclosure of 176 tomato varieties. A similar event did not occur in 2009/10, leading to an apparent large drop in the number of disclosures.
	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 (2009/10):	Total number of OMAFRA related patents filed: 10 <u>Patents filed by theme</u> Agricultural and Rural Policy: 0 Bioeconomy – Industrial Uses: 5

		Emergency Management: 0 Environmental Sustainability: 0
		Food for Health: 1 Product Development: 0 Production Systems (Animal): 3 Production Systems (Crops): 1
	Metric (c)	Number of licenses granted by theme
	Baseline:	17 licenses granted in 2008/09
	Target:	2009-13: Number of licenses granted to be ≥ 2008/09 baseline.
	Results (2009/10):	Total number of OMAFRA related licenses granted: 20 <u>License & amending agreements 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): 1 Production Systems (Crops): 18
	Metric (d)	Patents issued
	Baseline:	Five patents as per 2008/09
	Target:	2009/13: Number of patents issued to be ≥ 2008/09 baseline.
	Results (2009/10):	Total number of OMAFRA related patents issued: 0 (The number of issued patents on a year to year basis is small, and having zero in this year is not considered a serious setback. An increased number is expected in the subsequent fiscal year). <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: 0 Production Systems (Animal): 0 Production Systems (Crops): 0
	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 ≥ 2008/09 baseline.
	Results (2009/10):	Total dollar value of revenue generated from licenses associated with OMAFRA-supported research: \$1,083,226.90 Revenue from OMAFRA-supported non-seed research from fiscal year end April 30, 2010: \$473,005.01 Revenue from OMAFRA-supported seed research fiscal year-end March 31, 2010: \$610,221.93
	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 (2009/10):	Three case studies are provided in the Program Highlights Section - pages 31-33
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 (2009/10):	2009/10 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:	A total of 190 media citations were identified by researchers in their 2009 UofG 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 it represents the best available measure.
	Target:	2009-13: Number of media citations to be ≥ 2008/09 baseline.
	Results (2009/10):	From researchers' 2010 annual and final research reports, number of media citations: 194 Ag and rural policy: 20 Bioeconomy: 15 Emergency Management: 23 Environmental Sustainability: 11 Food for Health: 1 Product Development and Enhancement: 1 Production Systems: 123

Research Performance Indicator R1 (Metric d)

Listing of Active Research Projects

OMAFRA/UofG Research Program Projects – 2009/2010

Environmental Sustainability Theme

Project #	Start Date	Approved End Date	Approved Program	Title	Project Leader
200045	01-Jun-09	30-Apr-10	Env Sust	Land Use and Policy Impacts of the Transition to a Green Economy.	Weersink, A.
200027	02-Sep-09	31-Aug-12	Env Sust	Abatement of Agricultural Ammonia Emissions via Sequestration and Conversion to Nutrient and Bio-energy Feedstocks	Dixon, M.
200029	01-Jul-09	30-Apr-12	Env Sust	Life-Cycle Assessment of Greenhouse Gas Emissions and Economics of On-Farm Anaerobic Digesters	Wagner-Riddle, C.
200056	15-Jul-09	30-Apr-10	Env Sust	Evaluation of agri-environmental program performance: Lessons learned from the Environmental Farm Plan and two Ontario watershed programs	Cummings, H.
200013	01-Sep-09	31-Aug-12	Env Sust and Bio	Life Cycle Analysis Framework and Model for Assessing Life Cycle Impacts and Environmental Sustainability of Ontario Agricultural Feedstocks for Bioenergy	Wagner-Riddle, C.
200031	01-May-09	30-Apr-12	Env Sust	Toward ecologically sustainable choices for turfgrass applications in Ontario	Newman, J.
200081	01-May-09	30-Apr-12	Env Sust and Prod Systems	Long term field trials to examine yield, soil productivity and environmental impacts of Ontario corn, soybean and wheat production systems	Deen, Bill
200057	01-Jun-09	31-May-12	Env Sust and Prod Dev	Conversion of Poultry Manure into Value-added Products Using Fly Larvae	Zheng, Youbin
026577	01-May-08	31-Mar-10	Env Sust	Environmental Sustainability of On-farm Manure Anaerobic Digestion	Crolla, A.
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.
026598	01-May-08	30-Apr-11	Env Sust	Carbon, nutrient and economic impacts of Miscanthus production under Ontario conditions	Deen, B.
026599	01-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.
026579	01-May-08	31-Mar-11	Env Sust	Environmental impact of crop residue removal under conventional and zero-tillage scenarios.	Warland, J.

026580	01-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	01-May-08	30-Apr-10	Env Sust	Developing Environmental, Production and Marketing Best Management Practices for Ontario Agriculture	Bredahl, M.
026533	01-Apr-07	31-Mar-11	Env Sust	Manure and Organic Waste Treatment Technologies	Fleming, R
026545	01-May-07	30-Apr-11	Env Sust	Evaluating the Cost Effectiveness of Multiple Best Management Practices in Agricultural Watersheds.	Yang, W.
026597	01-May-08	30-Apr-11	Env Sust	Integrated assessment of atmospheric emissions of ammonia, greenhouse gases and size fractionated particulate matter across farming systems.	Van Heyst, B.
026603	01-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.
Bioeconomy - Industrial Uses Theme					
Project #	Start Date	Approved End Date	Approved Program	Title	Project Leader
026607	01-May-08	30-Apr-10	Bioeconomy	Engineered Biocomposites from Natural Fibers and Biodegradable Polymers for Transportation Industries	Mohanty, A.
026259	01-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	01-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	01-Jul-07	30-Apr-11	Bioeconomy	Economic Effects of Bioproduct Efforts on Ontario Agriculture.	Weersink, A.
200094	05-Jun-09	31-Mar-12	Bioeconomy and Prod Systems	Evaluation of Perennial Grass Biomass Systems in Ontario	Deen, B.
200001	01-Jul-09	30-Jun-12	Bioeconomy	Design and Engineering of Nano-enhanced Biopolyurethanes for Green Manufacturing	Misra, M.
200004	01-Jun-09	30-May-12	Bioeconomy	Renewable, Recyclable and Lightweight Hybrid Green Composites from Lignin, Switch grass, Miscanthus and Bioplastics for Sustainable Manufacturing	Mohanty, A.
200007	01-Jul-09	30-Jun-12	Bioeconomy	Evaluation of biomass production, nutrient cycling, harvesting, and end-use of biofuel crops in Eastern and Northern Ontario.	Rennie, T.
200013	01-Sep-09	31-Aug-12	Bioeconomy and Env Sust	Life Cycle Analysis Framework and Model for Assessing Life Cycle Impacts and Environmental Sustainability of Ontario Agricultural Feedstocks for Bioenergy	Wagner-Riddle, C.

Production Systems Theme - Tier I Projects

Project #	Start Date	Approved End Date	Approved Program	Title	Project Leader
026480	01-May-07	30-Apr-11	Prod Systems Tier I	From Vineyard to Vintage: the Ontario Grape Research Program	Fisher, H.
026481	01-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	01-May-07	30-Apr-10	Prod Systems Tier I	Healthy Food: Healthy Ontario. Vegetables, Human Nutrition, and the Environment.	McDonald, M.
026352	01-May-06	30-Apr-10	Prod Systems Tier I	Pest Management systems for sustainable field crop productions: responding to new challenges.	Swanton, C.
026354	01-May-06	30-Apr-10	Prod Systems Tier I	Reproductive technologies - from test tubes to animals.	King, A.
026358	01-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	01-May-06	30-Apr-10	Prod Systems Tier I	Genomic profiling for beef quality, efficiency and value.	Miller, S.
026361	01-May-06	30-Apr-10	Prod Systems Tier I	Sustainable pork production: Healthy pigs and safe pork.	Friendship, R.
026371	01-May-06	30-Apr-10	Prod Systems Tier I	Enhancing poultry health and welfare.	Nagy E.
026373	01-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.
026335	01-May-05	31-Mar-10	Prod Systems Tier I	Northwestern Grant	Rowsell, J.
026647	01-May-08	30-Apr-10	Prod Systems Tier I	Monitoring leaf functions to detect diseases in controlled-environment-systems (CES).	Goodwin, P.
200076	01-Jul-09	30-Jun-12	Prod Systems Tier I	Risk Assessment and Management of Invasive Pests of Field Crops in Current and Future Climates	Hallett, R.
200100	01-Oct-09	30-Sep-12	Prod Systems Tier I	EGF expressing <i>Lactococcus lactis</i> (<i>L. lactis</i>) for enhancing intestine development, health, and productivity of early-weaned pigs	Li, J.
200069	01-Jun-09	30-Jun-12	Prod Systems Tier I	The pathogenesis and control of necrotic enteritis in broiler chickens	Prescott, J.
200070	03-Jul-09	3-Jul-12	Prod Systems Tier I	Pathogenesis of <i>Clostridium perfringens</i> Type A diarrhea in neonatal pigs and its epidemiology on Ontario swine farms	Prescott, J.

200071	01-Jul-09	30-Jun-12	Prod Systems Tier I and Prod Dev	Product enhancement and cost reduction in greenhouses through application of advanced robotics systems	Moussa, M.
200072	01-Jun-09	31-May-12	Prod Systems Tier I	Biology and Management of Diseases of Turfgrasses and Woody Plants	Hsiang, T.
200073	15-Jun-09	30-Jun-11	Prod Systems Tier I	Investigation of automated activity monitoring for health and reproduction in dairy cattle	LeBlanc, S.
200074	01-Sep-09	31-Aug-11	Prod Systems Tier I	Limit-feeding dairy heifers: Maintaining health and welfare while improving feed efficiency and reducing feed costs and nutrient excretion	deVries, T.
200075	01-Jul-09	01-Jul-12	Prod Systems Tier I	Biomarkers to relate management of piglets post-weaning to subsequent growth performance, carcass and meat quality	deLange, C.
200077	01-Jun-09	31-May-11	Prod Systems Tier I	Evaluation of the Entomopathogenic Fungi, <i>Beauveria bassiana</i> , <i>Clonostachys rosea</i> , and <i>Metarhizium anisopliae</i> , as Biocontrol Agents Against the Honey Bee Parasitic Mite, <i>Varroa destructor</i>	Guzman, E.
200079	15-May-09	30-Apr-12	Prod Systems Tier I	The impact and management of pain in dairy cattle on health, performance and well-being	Duffield, T.
200080	01-Jun-09	30-Apr-12	Prod Systems Tier I	The use of behavioural monitoring for the prediction of impending health and welfare problems in dairy cattle	Leslie, K.
200081	01-May-09	30-Apr-12	Prod Systems Tier I and Env Sust	Long term field trials to examine yield, soil productivity and environmental impacts of Ontario corn, soybean and wheat production systems	Deen, B.
200083	01-Jun-09	31-May-12	Prod Systems Tier I	Understanding the spatial and temporal spread and clinical signs associated with various genotypes of the Porcine Reproductive and Respiratory Syndrome (PRRS) in Ontario	Dewey, C.
200085	01-Sep-09	31-Aug-10	Prod Systems Tier I	Investigation into methods of quantifying, relieving and preventing lameness in sows	Luimes, P.
200086	01-Sep-09	1-Sep-12	Prod Systems Tier I	Nutritional Strategies and monitoring of the peri-parturient sow.	Luimes, P.
200087	01-Jun-09	31-May-12	Prod Systems Tier I	Development of an integrated mycotoxin management system in Ontario grains	Schaafsma, A.
200088	01-Jan-10	31-Dec-11	Prod Systems Tier I	Mycotoxins and the developing neuroendocrine-immune system	Karrow, N.
200089	01-May-09	30-Apr-12	Prod Systems Tier I	Stabilizing Ontario canola yields for enhanced profitability and reduced risk.	Earl, H.
200091	01-Jun-09	30-May-13	Prod Systems Tier I	Mutation technology for production of new products and added value for greenhouse ornamental species	Somers, D.
200093	01-Jun-09	30-Jun-12	Prod Systems Tier I	Dairy Health and High-Low Immune Responders	Mallard, B.

200043	01-Jun-09	31-May-13	Prod Systems 1 and Food	Bean (<i>Phaseolus vulgaris</i>) Improvement for Health and Consumer Acceptance	Pauls, K. P.
200067	01-May-09	30-Apr-11	Prod Systems 1 and Food	Understanding the Genetic and Biochemical Control of Tocopherols and Luteins in Soybeans Leading to the Development of Soybean Cultivars and Germplasm with Enhanced Levels of Nutraceuticals	Ablett, G.
200101	01-Aug-09	31-Dec-12	Prod Systems Tier I	Natural enrichment of milk with functional bioactive compounds	Cant, J.
200103	01-Jun-09	31-Dec-12	Prod Systems Tier I	Healthy animals produce healthful products; an integration from animal health to human health	McBride, B.
200094	15-Jun-09	31-Mar-12	Prod Systems 1 and Bioeconomy	Evaluation of Perennial Grass Biomass Systems in Ontario	Deen, B.

Sustainable Production Systems Research Program - Tier II Projects

Project #	Start Date	Approved End Date	Approved Program	Title	Project Leader
026646	01-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.
026786	15-Jun-09	30-Apr-11	Prod Systems Tier II	An Evaluation of the Effect of Systemic Supplementation of Selenium on Dairy Calf Health from Birth to Weaning	Leslie, K.
026787	22-Jun-09	30-Apr-11	Prod Systems Tier II	Improving Outcomes after Microfracture Repair of Cartilage Defects by High Resolution Imaging and Presurgical Planning	Hurtig, M.
026788	01-May-09	30-Apr-10	Prod Systems Tier II	An Evaluation of the Effect of Anafen Administration on Pain, Well-Being and Production Post Left Displaced Abomasum Surgery in Dairy Cattle	Duffield, T.
026789	01-May-09	30-Apr-11	Prod Systems Tier II	Improving udder health in automatic milking systems through feed bunk management and design	DeVries, T.
026790	01-May-09	31-Aug-11	Prod Systems Tier II	Effect of local anesthetic deposition into structures of the foot on subsequent magnetic resonance images.	Cribb, N.
026791	01-May-09	31-Dec-11	Prod Systems Tier II	Laryngeal Ultrasound as Novel Diagnostic Technique	Chalmers, H.
200106	04-Aug-09	31-Jul-10	Prod Systems Tier II	Improving the innate resistance of beef cattle to bacterial pneumonia	Caswell, J.
200105	01-Jul-09	30-Jun-12	Prod Systems Tier II	Functional Genomics of Equine Inflammation and Immunity	Bienzle, D.
200108	01-Oct-09	31-Dec-10	Prod Systems Tier II	Characterizing the adaptive response of the rumen epithelium during dramatic shifts in rapidly fermentable carbohydrates in lactating dairy cattle	McBride, B.
200109	01-Sep-09	01-Sep-12	Prod Systems Tier II	Assessing the behaviour and welfare of broiler breeders using alternative feeding strategies	Torrey, S.

200111	16-Nov-09	16-Feb-10	Prod Systems Tier II	Feather Corticosterone: an Index of Stress in birds	Barker, I.
200139	01-Dec-09	31-Dec-10	Prod Systems Tier II	Seasonal variance of the fecal microbiota in horses.	Arroyo, Luis
200140	04-Jan-10	31-Dec-10	Prod Systems Tier II	Anti-inflammatory evaluation of High Rosmarinic Acid Mint (HRAM) in horses with LPS-induced articular inflammation	Kott, L.
200233	01-Apr-10	31-Mar-11	Prod Systems Tier II	Alternative strategies for plan height control through nutrient management	Blom, Theo
200320	19-Mar-10	30-Apr-012	Prod Systems Tier II	Parasite Control in Sheep	Menzies, P.
026443	01-May-06	30-Apr-12	Prod Systems Tier II	Osteoarthritis and Quality of Life	Hurtig, M.
026626	01-Jun-08	30-Jun-09	Prod Systems Tier II	Genetic regulation of immune responsiveness and disease resistance of dairy cattle	Mallard, B.
200327	01-Jan-09	31-Dec-10	Prod Systems Tier II	Prevalence of Clostridium difficile and MRSA and Infecting bacteriophage in the pork processing	Warriner, K.
026536	01-Sep-07	01-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	01-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	01-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	01-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	01-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	01-May-06	30-Apr-10	Prod Systems Tier II	Forages for alternative management systems.	Bowley, S.
026363	01-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	01-May-06	30-Apr-10	Prod Systems Tier II	Cereal evaluation and breeding for an enhanced and sustainable future.	Falk, D.
026356	01-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	01-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	01-May-06	30-Apr-10	Prod Systems Tier II	Reducing fossil fuel inputs in corn production through breeding and agronomy.	Lee, E.
026340	01-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	01-May-08	30-Apr-10	Prod Systems Tier II	Effect of feeding management on learning of diet selection in dairy heifers.	DeVries, T.
026630	01-May-07	30-May-10	Prod Systems Tier II	Recombinant Bovine C3d as an Adjuvant to Facilitate Early CalfhooD Vaccination	Shewen, P.
026637	01-May-08	30-Apr-10	Prod Systems Tier II	Mechanisms of maintenance and loss of early pregnancy	Betteridge, K.
026638	01-May-08	30-Apr-10	Prod Systems Tier II	Functions of Equine Clara Cell Secretory Protein	Bienzle, D.
026639	01-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	01-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	01-Jul-07	30-Apr-11	Prod Systems Tier II	Mitigating ammonia release from caged layer facilities.	Leeson, S.
026553	01-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	01-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	01-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	01-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	01-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	01-Nov-08	31-Oct-11	Prod Systems Tier II	The application of genomic approaches to rainbow trout aquaculture	Danzmann, R.

026646	01-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.
026645	01-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
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	15-Oct-09	Ag & Rural Policy	Assessment of the Current and Future Farm Economy of the Ontario Greenbelt	Cummings, H.
026525	01-Apr-07	31-Dec-09	Ag & Rural Policy	Policy alternatives for severely reducing or eradicating poverty in rural Canada	Reid, D.
026594	01-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.
200046	01-Jul-09	30-Jun-10	Ag & Rural Policy	Assessment of Availability of Agricultural Biomass for Electricity and Heat Generation in Ontario	Deen, B.
200047	01-Sep-09	31-Aug-12	Ag & Rural Policy	Environmental Sustainability Policy Compliance Costs, Comparative Advantage, and Competitiveness of Ontario Livestock Industry	Fox, G.
200048	01-Jun-09	30-Jun-12	Ag & Rural Policy	Industrial Composition and Economic Performance in Rural Ontario	Deaton, B.
200049	01-Jun-09	31-Jul-10	Ag & Rural Policy	Comparing Returns and Volatility from a Range of Marketing Strategies for Grains and Oilseeds in Ontario: A Simulation Approach.	Vyn, R.
200050	01-Sep-09	30-Sep-11	Ag & Rural	Local Food Initiatives in Ontario from the Farmer's Perspective	Devlin, J.

200051	01-Jul-09	01-May-12	Policy Ag & Rural Policy	Prospering with a Stable or Declining Population: Best Community Economic Development and Planning Practices for Rural Communities	Caldwell, W.
200052	01-Jun-09	30-Apr-10	Ag & Rural Policy	The Agricultural and Rural Policy Implications of a Changing Agricultural Sector	Weersink, A.
200053	01-Jun-09	31-May-10	Ag & Rural Policy	Effects of Farm Safety Net Programs on Income and Competitiveness of Farms under Different Size Categories in Ontario	Sarker, R.
200054	01-Jul-09	01-May-10	Ag & Rural Policy	Identifying Rural Research Priorities Through Community Engagement	Caldwell, W.
200055	01-Jul-09	01-Jul-10	Ag & Rural Policy	Human Resource Management: Best Practices in the Ontario Agriculture Industry	Mann, S.
200056	15-Jul-09	30-Apr-10	Ag & Rural Policy and Env Sust	Evaluation of agri-environmental program performance: Lessons learned from the Environmental Farm Plan and two Ontario watershed programs	Cummings, H.
200045	01-Jun-09	30-Apr-10	Ag & Rural Policy and Env Sust	Land Use and Policy Impacts of the Transition to a Green Economy.	Weersink, A.

Product Development and Enhancement Through Value Chain Theme

Project #	Start Date	Approved End Date	Approved Program	Title	Project Leader
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.
200058	01-Jul-09	30-Jun-10	Prod Dev	Product Development of a Therapeutic Antibody in Tobacco through Production, Purification and Analytical Value Chains in Ontario	Hall, J. C.
200059	01-Sep-09	31-Aug-12	Prod Dev	Development of high performance edible soy protein nanocomposite films and coatings for co-extrusion applications	Lim, L.
200062	01-Sep-09	31-Aug-12	Prod Dev	Novel use of organogels to replace traditional animal fat in meat products	Barbut, S.

200064	01-Sep-09	31-Aug-12	Prod Dev and Food	Characterizing the sensory attributes of whole grain wheat-based products and the phenolics associated with these attributes	Duizer, L.
200071	01-Jul-09	30-Jun-12	Prod Dev and Prod Syst	Product enhancement and cost reduction in greenhouses through application of advanced robotics systems	Moussa, M.
200057	1-Jun-09	31-May-12	Prod Dev and Env Sust	Conversion of Poultry Manure into Value-added Products Using Fly Larvae`	Zheng, Y.

Emergency Management Theme

Project #	Start Date	Approved End Date	Approved Program	Title	Project Leader
026614	01-Jan-08	31-May-10	Emerg Mgmt	Development of an avian cell line	Nagy, E.
200015	01-Jun-09	01-Sep-11	Emerg Mgmt	Biosecurity assessment as a tool to develop a risk-based surveillance in the Ontario swine industry	Poljak, Z.
200016	01-Sep-09	31-Aug-12	Emerg Mgmt	Spatial and Network Individual-level Models of Infectious Disease Spread within a Bayesian Statistical Framework via Markov Chain Monte Carlo (MCMC)	Deardon, R.
200017	01-Sep-09	30-Aug-10	Emerg Mgmt	Evaluation of spatial surveillance methods under imperfect diagnostic test systems with emphasize on emerging Zoonoses	Berke, O.
200018	01-Sep-09	31-Aug-11	Emerg Mgmt	Extraction and Detection of Human Pathogens using Antibody Modified Electrospun Conducting Polymer Fibers	Warriner, K.
200020	01-Jun-09	31-Dec-09	Emerg Mgmt	Disease Surveillance of Swine Using Farm-Based Mortality Data	Friendship, R.
200021	01-Jun-09	30-Apr-10	Emerg Mgmt	Producer perceptions of food-borne and zoonotic diseases associated with sheep and goat dairy farms and products	Jones, A.
200022	01-Jun-09	31-May-10	Emerg Mgmt	Swine Influenza surveillance in Ontario finisher pigs	Dewey, C.
200023	01-Sep-09	31-May-10	Emerg Mgmt	A needs assessment survey of the emergency preparedness status of Canadian provincial and university animal health diagnostic laboratories	Spinato, M.
200024	01-Aug-09	31-Jul-10	Emerg Mgmt	Advancement of Poultry Disease Spread Modelling	Stacey, D.
200025	01-Jul-09	30-Apr-10	Emerg Mgmt	Multi-disciplinary integrated surveillance of the antimicrobial resistance in <i>Salmonella</i> , <i>Campylobacter</i> , and <i>E. coli</i> on Ontario swine farms	Friendship, R.
200026	01-Jul-09	30-Nov-09	Emerg Mgmt	Are amoebae a practical culture tool for investigating the diversity and persistence of potential intracellular pathogens in target local environments?	Mutharia, L.

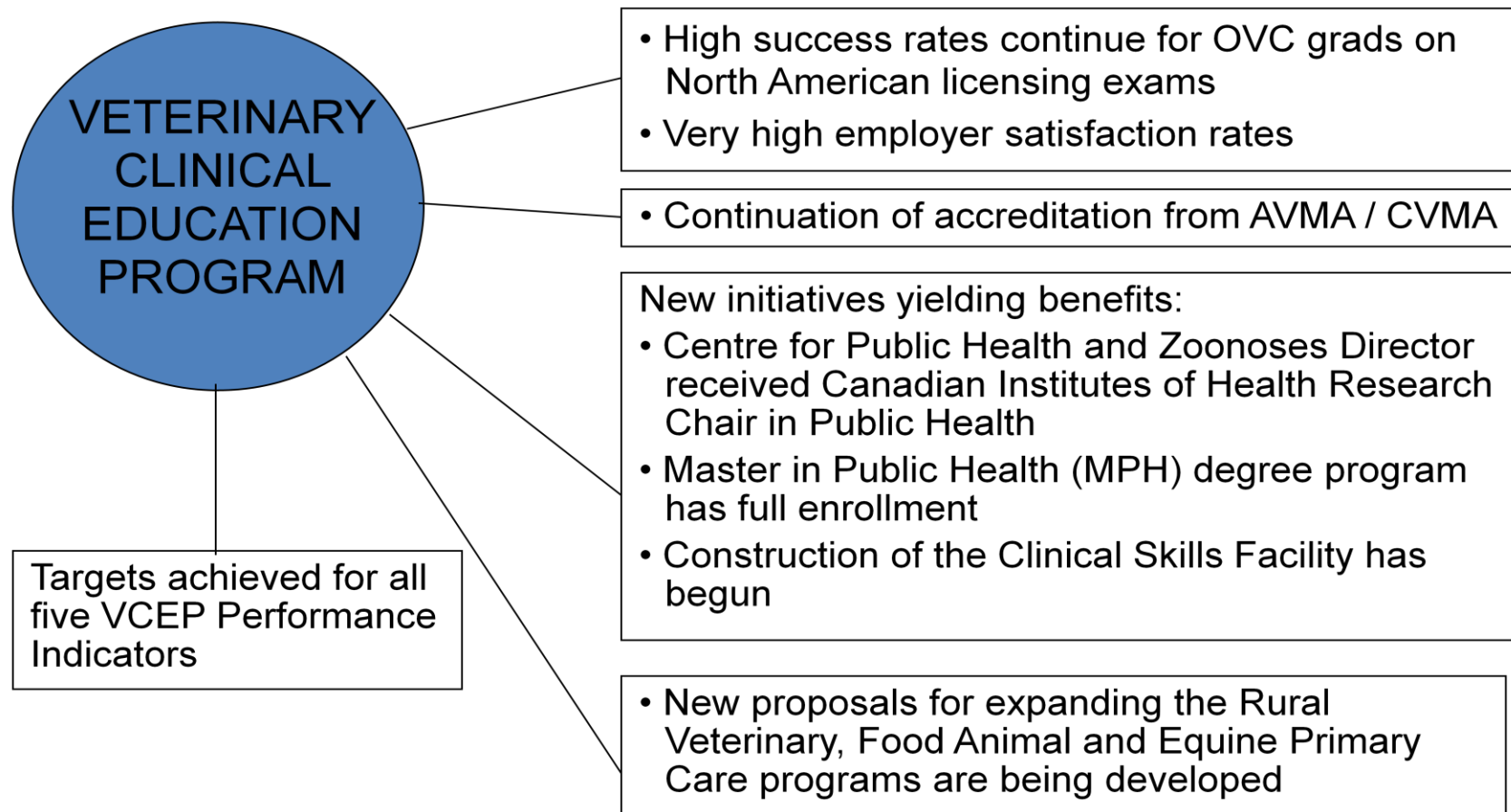
Food for Health Theme

Project #	Start Date	Approved End Date	Approved Program	Title	Project Leader
200110	19-Nov-09	18-Nov-10	Food for Health	Development of Functional 1,3 Diacylglycerol Fats	Lencki, R.
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.
200067	01-May-09	30-Apr-11	Food for Health and Prod Syst	Understanding the Genetic and Biochemical Control of Tocopherols and Luteins in Soybeans Leading to the Development of Soybean Cultivars and Germplasm with Enhanced Levels of Nutraceuticals	Ablett, G.
200107	01-Oct-09	30-Sep-11	Food for Health Tier II	valuation of Nutrifin Plus in lactating dairy cows: effect on feed intake, milk yield and milk organoleptic properties.	Kott,L.
200035	01-Jun-09	30-Apr-12	Food for Health	Bio-accessibility, Bio-availability and Anti-inflammatory Action of Nutraceutical Components from Ontario Berry Fruits, Tender Fruits and their Products	Paliyath, G.
200040	01-Jul-09	31-July-12	Food for Health	Encapsulation of bioactive peptides using protein based nanostructures	Corredig, M.
200032	01-Sep-09	31-Jul-12	Food for Health	The regulation of adipocyte differentiation and insulin signalling by dietary monounsaturated fatty acids	Mutch, D.
200064	01-Sep-09	31-Aug-12	Food for Health and Prod Dev	Characterizing the sensory attributes of whole grain wheat-based products and the phenolics associated with these attributes	Duizer, L.
026573	01-May-08	01-May-10	Food for Health	Fibre-fortified dairy products: Effects on nutritional and functional properties	Goff, H.D.
200043	01-Jun-09	31-May-13	Food for Health and Prod Syst	Bean (<i>Phaseolus vulgaris</i>) Improvement for Health and Consumer Acceptance	Pauls, K.P.

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 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:	AVMA/CVMA Full Accreditation
	Target:	2009-2013: maintain AVMA/CVMA Accreditation
	Results (2009/10):	On March 15, 2010, OVC was granted a continuation of its full accreditation based on a vote by the AVMA/CVMA Council on Education. OVC is required to submit an annual update report documenting any changes the College has made that would impact any of the 11 accreditation standards. These two organizations represent the highest standard of achievement for veterinary medical education in the world. The accreditation process focuses on the Doctor of Veterinary Medicine program and the institutional resources, infrastructure and personnel that support it. 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 UofG 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 (2009/10):	See Faculty FTE Table below

OVC Faculty FTE ¹ (Base funded in 2009-2010)

Department	Discipline		Assistant Professor	Associate Professor	Professor	Total
Pathobiology	Anatomic Pathology		2.00	3.00	1.00	6.00
	Avian Pathology		0.00	0.00	1.00	1.00
	Bacteriology		0.00	1.00	2.00	3.00
	Clinical Pathology		0.00	1.00	2.00	3.00
	Comparative Pathology		0.00	1.00	2.00	3.00
	Immunology		1.00	1.00	2.00	4.00
	Laboratory Animal Science		0.00	1.00	0.00	1.00
	Parasitology		0.00	1.00	1.00	2.00
	Virology		1.00	0.00	1.00	2.00
	Wildlife/Zoo Pathology		1.00	0.00	0.00	1.00
		Sub-total	5.00	9.00	12.00	26.00
Clinical Studies	Anesthesiology		0.00	3.00	1.00	4.00
	Cardiology		0.00	1.00	1.00	2.00
	Companion Animal Medicine		3.00	1.00	1.00	5.00
	Companion Animal Surgery ²		3.00	2.00	1.00	6.00
	Dermatology		0.00	1.00	0.00	1.00
	Emergency and Critical Care		0.00	1.00	0.00	1.00
	Large Animal Medicine		2.00	0.00	2.00	4.00
	Large Animal Surgery		3.00	1.00	1.00	5.00
	Neurology		1.00	2.00	0.00	3.00
	Oncology		1.00	0.00	1.00	2.00
	Ophthalmology		1.00	1.00	0.00	2.00
	Radiology		1.00	1.00	0.20	2.20
		Sub-total	16.00	14.00	8.20	38.20
Population Medicine	Communications		1.00	0.00	0.00	1.00
	Epidemiology		6.34	0.00	2.00	8.34
	Equine Health Management		0.00	1.00	0.00	1.00
	Farm Health Ethology		1.00	0.00	0.00	1.00
	Public Health (incl. CPHAZ)		0.00	2.00	1.19	3.19
	Ruminant Health Management		1.00	3.00	2.00	6.00
	Swine Health Management		0.00	0.00	2.00	2.00
	Theriogenology		2.00	0.00	1.00	3.00
		Sub-total	11.34	6.00	8.19	25.53
Biomedical Sciences	Anatomy		1.00	1.00	1.00	3.00
	Cellular/Molecular Biology		1.00	1.00	3.00	5.00
	Neurology		1.00	0.00	1.00	2.00
	Pharmacology/Toxicology		0.00	4.00	2.00	6.00
	Reproductive Biology		2.00	1.00	1.00	4.00
	Physiology		2.00	1.00	0.00	3.00
		Sub-total	7.00	8.00	8.00	23.00
	TOTAL		39.34	37.00	36.39	112.73
Notes						
1. In 2009-10 VCEP funding contributes support equivalent to 12.40 faculty which is 11% of the total OVC 112.73 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 2007/08 graduating class (2008/09 data were not used due to technical collection errors.)
	Target:	2009-2013: maintain percentages from 2007/08 annual student and employer surveys
	Results (2009/10):	Of graduates who responded (n = 70), 98% 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 (n = 40), 92% 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. 2007/08 Results: 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:	Baseline is the 2008/09 pass rate for NAVLE students.
	Target:	2009-2013: That OVC students continue to meet or exceed the mean pass rate for all students writing the NAVLE exam.

	Results (2009/10):		Dec 09 & Apr 10		Dec 08 & Apr 09 (baseline)	
			OVC	All	OVC	All
		Number Taking Exam	114	3061	106	3009
		Number Passing	114	3002	104	2908
		Percent Passing	100	98	98	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:	Baseline is 15.1 DVSc students.				
	Target:	2009-2013: maintain funding for 15.1 DVSc students working in areas of priority to OMAFRA.				
	Results (2009/10):	See DVSc enrolment Table below				

TOTAL ENROLMENT NUMBER OF DVSC STUDENTS

WITH SUPPORT FROM VCEP FUNDING ¹

May 1, 2009 to April 30, 2010

Department	Discipline	Total Number of Students Enrolled in 2009-10 (Headcount) ²			
		In Program	New	Graduating	Total # Enrolled
Pathobiology	Anatomic Pathology	4	1	1	6
	Clinical Pathology	1	1	1	3
	Avian Exotic	0	0	0	0
	Laboratory Animal Science	1	0	0	1
	Oncology	0	0	0	0
	Sub-total	6	2	2	10
Clinical Studies	Anesthesiology	1	1	1	3
	Companion Animal Surgery	2	0	0	2
	Companion Animal Medicine	1	1	1	3
	Large Animal Medicine	2	1	1	4
	Large Animal Surgery	2	1	1	4
	Emergency and Critical Care	1	0	0	1
	Neurology	1	1	1	3
	Cardiology	1	0	0	1
	Radiology	0	0	0	0
	Sub-total	11	5	5	21
Population Medicine	Health Management	3	0	0	3
	Theriogenology	1	1	1	3
	Sub-total	4	1	1	6
Biomedical Sciences	N/A	0	0	0	0
	Sub-total	0	0	0	0
	OVC Total	21	8	8	37

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 = 29 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 Agreement, 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 of the program, achievements made during the 2009/10 fiscal year are described below:

- The UofG hired two contract 'knowledge mobilization managers' to fill out the KTT program staffing in February 2010. One of these positions is to focus on the science – policy interface and the other is to focus on the 'program application' area.
- A brand name, '**Agri-Food and Rural Link**', was created for the OMAFRA/UofG KTT Program. The name will be used to advertise the KTT program, including being used as a twitter name. Currently, a graphic designer is creating a logo/letter head and fact sheet template for Agri-Food and Rural Link.
- The Agri-Food and Rural Link **KTT Funding Program** was launched in May 2010. The first call for proposals opened on May 17th, 2010, with two other calls scheduled for Fall 2010 and Winter 2011. Along with the RFP, supporting documentation was created for the KTT Funding Program including a factsheet on the program, an FAQ page, evaluation scorecard, and a summary of KTT principles and priorities.
- To support the KTT Funding Program, two Town Hall meetings were held on May 18th and 19th, 2010 at OMAFRA and the University of Guelph respectively. Both OMAFRA KTT staff and UofG KTT staff have been devoting time towards assisting applicants with the development of their KTT proposals.
- Agri-Food and Rural Link has developed and enhanced networks and exchange of knowledge between a variety of internal and external stakeholders through individual networking and by co-hosting and organizing research highlight days including:
 - **Community Economic Development Meet and Greet (May 6, 2010)**
 - Share OMAFRA's Rural Policy Research Priorities with representation from a range of departments and programs at the University of Guelph.

- Provide the opportunity for key OMAFRA staff to meet researchers at the University of Guelph and become familiar with their areas of research interest.
- Provide the opportunity to explore collaborations/ future research opportunities with UofG researchers.
- **Environmental Sustainability Day (June 15, 2010)**
 - Provide an opportunity for networking, collaboration, learning and sharing new ideas and innovations in the area of agri-environmental sustainability.
 - Highlight research funded under the Environmental Sustainability research theme.
 - Provide an opportunity for input in OMAFRA research priorities.
- The existing UofG webpage on the OMAFRA/UofG Partnership KTT Program has been updated to reflect the current KTT activities taking place. Separate web pages have been created for the KTT Funding Program, Events, KTT Resources, and Research Theme Knowledge Information.

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. This plan is currently in the process of being updated.

Over the past year, a more coordinated effort was put in place to give profile to the Partnership through the Minister's office. A commitment was made to have regular communication meetings between Partnership communications staff -- Owen Roberts, Liz Snyder from the Office of Research, UofG and Robyn Meerveld, OMAFRA -- and communications branch staff. These meetings are a way to not only keep each other up to date on communications efforts, but to also continually identify ways to involve the Minister in the Partnership.

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 continued and grown throughout 2009/10 in accordance with the plan.

News@Noon

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

- Four presentations were made in 2009/10
- Topics were:
 - “The Agriculture and Food Laboratory – working to keep your food safe” (presentation by John Melichercik and Rena Hubers)
 - “Biological life support for the exploration of space” (presentation by Mike Dixon about his Partnership funded research regarding growing vegetables in space)
 - “Crispy, crunchy and delicious: The science behind potato chips.” (presentation by Rickey Yada on his Partnership funded research into how to produce a better potato)
 - “What happened to the honey bee?” (presentation by Ernesto Guzman on his Partnership funded research into why colonies of bees have been dying, and how to help stop the problem)
- Up to 100 people attended each event, in some cases attendees included industry representatives

The Buzz

The Buzz is an electronic community news vehicle for and about the OMAFRA/UofG Partnership. The Buzz contains articles up to 150 words long about research, research stations, news and coming events related directly to any of the programs supported through the Partnership. A second Buzz writing workshop for contributors is being planned.

- In 2009/10, there were 10 new issues of the Buzz
- Originally meant primarily as internal communications vehicle within the Ministry and the University, circulation now includes approximately 25 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 374 people including UofG personnel (administrators then forward to their departmental faculty and staff) and external names, and it is also forwarded to 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 2009 and April 2010, 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. Students contribute SPARK*AIR radio pieces which profile agricultural research at the UofG. The SPARK*AIR program continued this year, and more details about this program are below.

In total, 55 print stories were published by SPARK about the partnership. As well, Owen Roberts writes weekly columns called Urban Cowboy, which are published in both the *Guelph Mercury* and the *Woolwich Observer*. In 2009/10, Owen wrote nine Urban Cowboy columns relating to the Partnership, and two Partnership related stories for *The Grower* which is the Ontario Vegetable Grower's monthly newspaper.

SPARK celebrated its 20th anniversary this year – a significant milestone that speaks to the sustainability of the program. SPARK was also the recipient of several awards over the 2009/10 season, and these awards are listed in Appendix A.

SPARK*AIR – Partnership sponsored video stories

Building on the success of the first season of Partnership video stories, the Partnership continued funding the SPARK*AIR program including funding for:

- Two SPARK student writers
- Posting of the videos on Farms.com

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. Most of the students participating this year have been involved since the beginning of SPARK*AIR, so their skills are growing and the product is getting better.

A key to SPARK*AIR is a partnership with commercial agricultural information provider www.farms.com. From May 2009 to May 2010, 21 stories were completed and posted to www.farms.com's main page, a popular website for agricultural expertise. SPARK*AIR also expanded its broadcast outreach by partnering with Rogers Television Guelph in February 2010 to air stories on the weekly newsmagazine show *First Local*. All stories produced, and their air dates are listed in Appendix A.

Feedback from this initiative, from key OMAFRA and UofG staff as well as farms.com has been encouraging – so much so that organizations are approaching SPARK*AIR to produce stories and informational videos for them. For example, SPARK*AIR was approached to work with OMAFRA to produce two educational videos about giant hogweed. Two SPARK students worked with Mike Cowbrough, OMAFRA weed specialist, and Susin Micallef, OMAFRA communications to produce "Giant hogweed identification" and "Mature giant hogweed" hosted on the OMAFRA homepage here:

http://www.omafra.gov.on.ca/english/crops/facts/ontweeds/giant_hogweed.htm

The program continues to raise the profile of agri-food research, the Partnership, the University and the Ministry.

Yearbook

One of the key communications initiatives is 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 second 32-page special issue of *Research* magazine, focusing on the Partnership called the "2010 Agri-food Yearbook". The format for this edition is the same as 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 October 2010.
- The Yearbook will also be included as a 'chapter' within this OMAFRA/UofG Partnership "Annual Report". To be distributed to all subscribers of Ontario Farmer, November, 2010.

As a result of this magazine OMAFRA communications staff realized the news value of Partnership research and wanted to promote not just stories from the Yearbook, but other Partnership stories as well. Several video stories were posted on the OMAFRA newsroom website, and the Government of Ontario newsroom website as follows:

OMAFRA Newsroom site: <http://www.omafra.gov.on.ca/english/infores/releases/storyideas.html>

- June 2010 – "Study sheds light on bee colony losses" – Ernesto Guzman
- April 2010 – "Fireflies lead farmers to gold" - Manish Raizada, written by SPARK writer Natalie Osborne
- March 2010 – "Fibre fortified dairy treats" – Doug Goff

Ontario Newsroom site: <http://news.ontario.ca/newsroom/en/>

- June 15, 2010 - "Making plastic from straw" – Amar Mohanty and BDDC
<http://news.ontario.ca/newsroom/en/2010/06/making-plastic-from-straw.html>
- June 15, 2010 – "Pitted fruit packs a punch" – Jay Subramanian
<http://news.ontario.ca/newsroom/en/2010/06/fresh-pitted-fruit.html>

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.

Affiliated researcher terms are for two years, and that meant starting in July 2010, renewal forms were sent out for people to renew. Most accounts are being renewed and that process is ongoing.

Highly Qualified Personnel Program (HQP)

The HQP Scholarship Program provides training and development opportunities designed to enhance the “market-readiness” of graduate students by providing experiential learning opportunities beyond that which is normally available to graduate students working in the diverse areas of the Agri-Food system.

Opportunities to participate in this program are available to graduate students at other universities with which we are partnered in priority research areas. As well, international students can apply for these scholarships, in keeping with the province’s targeted objectives of diversity and inclusiveness. Students from disciplines other than the traditional life sciences are also applying to the program.

In 2009/10 there were two calls for applications for graduate students starting their various degree programs in Fall 2009, Winter, Spring and Fall 2010 and Winter 2011. There were 115 applications and 53 of these students were awarded scholarships. Applications were ranked mainly on the students’ academic transcript, their CV and cover letter which allowed for personal details of their agri-food aspirations and in particular their perceived fit to the goals of the HQP program. The other major assessment criterion was fit of their proposed research / activity as it aligns with OMAFRA research priorities. The past achievements of the faculty supervisor were also considered within the applications. Awards were made across 12 departments on campus to 29 MSc students and 24 PhD students. These awards represent a commitment of \$2.5m through to 2013, the last date that some of these students will complete their studies. The next call for applications is scheduled for February 2011 for students starting their programs in Spring and Fall 2011. A subsequent competition will be opened in June 2011 for students starting in the Fall 2011 and Winter 2012. It is anticipated approximately 20 additional scholarships will be granted.

HQP students 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, UNIV 6050, 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. This two-semester course is being taught for the first time in the Fall 2010 and Winter 2011 semesters. There are currently 32 of the HQP students enrolled.

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. The location of the work semester/job shadowing will be approved by the coordinator of the HQP program. The OMAFRA HQP program is partnering with MITACS Accelerate for joint funding of several work experience programs. This will bring leveraged funding to the HQP program. The student’s research program and their job shadowing experience must conform to the research themes and research priorities outlined in the ‘OMAFRA Strategic Research Themes: Priorities for 2008-2012’.

In his role as Coordinator of the HQP program, Dr. Steve Leeson is working closely with the AVPR Agri-Food and Partnerships, the Research Program Directors (who oversee the OMAFRA/UofG Research Themes), the corresponding OMAFRA Director Champions, and others within the UofG and OMAFRA communities to, implement the HQP program.

Animal Health Laboratory:

Animal Health Strategic Initiatives (AHSI) Annual Progress Report

In 2009/10, 28 research projects were approved for funding under the Animal Health Strategic Investment (AHSI). Of these, 9 were classified as new test development, 18 were classified as surveillance or survey projects, and 1 was classified as an emergency preparedness project.

Three new pieces of equipment were purchased in 2009/10 using AHSI funding that will support the development of new tests both within AHSI projects and in turn within the AHL labs in general.

Five AHL project staff members are supported directly from AHSI funding: 1 project administrator, 5 laboratory technicians. Within various projects various other personnel are supported: 3 post-doctoral fellows, 12 undergraduate students, 4 lab support personnel, 5 Masters of Science students and 1 Doctor of Philosophy student.

Follow up investigations have been conducted in 2009/10. Much of the testing performed has been in the interest of on-going monitoring, and \$57,048 has been spent on this testing.

New test development projects:

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).

AHSI Project 09-14: DNA bar-coding of coccidial parasites of production animals: Development and field testing of a LightCycler-based quantitative test (Project Lead: Dr. John Barta).

AHSI Project 09-15: Rapid detection and typing of *Haemophilus parasuis* (Project Lead: Dr. Hugh Cai).

AHSI Project 09-17: Development of in-situ hybridization (ISH) for diagnosis of *Coxiella burnetii* and *Toxoplasma gondii* in small ruminants (Project Lead: Dr. M. Hazlett).

AHSI Project 09-22: Optimization and validation of real-time PCR to determine the prevalence of pathogenic and non-pathogenic *Brachyspira* spp in Ontario layer flocks and to identify risk factors associated with dirty egg syndrome (Project Lead: Dr. D. Slavic).

AHSI Project 09-25: Validation of serum amyloid A (SAA) an acute phase protein as marker of inflammation in horses (Project Lead: Dr. B. Hoff).

AHSI Project 10-01: Using glycantyping to predict outcome in Ontario sow herds experiencing porcine reproductive and respiratory (PRRSV) outbreaks. (Project Lead: Dr. J. Alsop).

AHSI Project 10-02: Validating and implementing new real time PCR tests and ELISAs for mammalian viruses (Project Lead: Dr. S. Carman).

AHSI Project 10-03: Molecular typing of *Coxiella burnetii* identified in Ontario by multiple-locus variable number of tandem repeat analysis (MLVA) (Project Lead: Dr. Shu Chen).

AHSI Project 10-10: LHV-4 in Ontario rabbits (Project Lead: Dr. P. Turner).

Surveillance projects:

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).

AHSI Project 09-16: Is the treatment of exudative epidermitis in pigs becoming a problem because of the emergence of antimicrobial resistance? (Project Lead: Dr. R. Friendship).

AHSI Project 09-18: Associations between the incidence of *Cryptosporidium parvum* and selenium status in neonatal dairy calves in Ontario (Project Lead: Dr. K. Leslie).

AHSI Project 09-19: Surveillance for inclusion body hepatitis in broiler breeders (Project Lead: Dr. D. Ojkic).

AHSI Project 09-20: The development and design of a surveillance system for antimicrobial resistance in agricultural animal pathogens in Ontario (Project Lead: Dr. D. Pearl).

AHSI Project 09-21: Developing and implementing techniques to harvest additional surveillance information from existing AHL diagnostic laboratory data (Project Leads: Dr. C. Revie and Dr. J. Sanchez).

AHSI Project 09-23: Ear tip necrosis in swine (Project Lead: Dr. R. Friendship).

AHSI Project 09-24: Surveillance of antimicrobial resistant enteric bacteria in antimicrobial-free and conventional broilers in Ontario – a pilot study (Project Lead: Dr. M. Guerin).

AHSI Project 09-26: Proposal to determine the prevalence of *Coxiella burnetii* infection in sheep flocks and goat herds in Ontario and their farm workers (Project Lead: Dr. M. Guerin).

AHSI Project 09-27: Surveillance for enteric parvoviruses in poultry – a pilot study (Project Lead: Dr. É. Nagy).

AHSI Project 09-28: Risk-based surveillance of respiratory infections in growing pigs (Project Lead: Dr. Z. Poljak).

AHSI Project 09-29: Identification of novel toxin gene(s) associated with type A *Clostridium perfringens*-associated haemorrhagic abomasitis of calves in Ontario (Project Lead: Dr. J. Prescott).

AHSI Project 09-30: Genotyping and detection of *Leptospira spp.* in wildlife reservoir hosts in Ontario through comparison of immunohistochemical and polymerase chain reaction genotyping methods (Project Lead: Dr.K. Shearer).

AHSI Project 09-31: Case series of pandemic H1N1 in Ontario turkey breeder flocks (Project Leads: Dr. M. Guerin and Dr. Z. Poljak).

AHSI Project 10-04: Johne's Disease in Ontario's small ruminant dairy industries: Prevalence, potential risk factors, and performance comparison of serum, milk and fecal diagnostic methods (Project Lead: Dr. A. Jones).

AHSI Project 10-05: Expanded data transfer from AHL to CAHSN: In support of improved notifiable disease reporting to CFIA, emergency preparedness, timely disease detection and data analysis (Project Lead: Dr. H. Kloeze).

AHSI Project 10-06: Comprehensive evaluation of bacterial hazards in the upper respiratory tract of swine by terminal restriction fragment length polymorphism (T-RFLP) analysis (Project Lead: Dr. J. MacInnes).

AHSI Project 10-07: Regional PRRS elimination trial (Project Lead: L. Moser).

AHSI Project 09-08: Summer student assistantships, AHL Mammalian Virology and Bacteriology (Project Leads: Dr. D. Slavic and Dr. S. Carman).

Farm-call surveillance project:

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 preparedness project:

AHSI Project 10-09: AHL necropsy laboratories emergency preparedness exercises and incident command system training (Project Lead: Dr. M. Spinato).

Emergency Plans

The Canadian/Ontario food animal industry must be constantly vigilant and prepared for an outbreak of a contagious animal disease. Hence all commodity groups have a shared responsibility to develop crisis management plans and exercise effective collaboration and communication strategies to ensure an effective response during a crisis.

In the fall of 2009 and winter of 2010, planning began for AHL's participation in a spring 2010 poultry disease outbreak simulation initiative led by the Feather Board Command Centre (FBCC) (comprised of Chicken Farmers of Ontario (CFO), Egg Farmers of Ontario (EFO), Ontario Broiler Hatching Egg and Chick Commission (OBHECC), and Turkey Farmers of Ontario (TFO). The exercise and testing of 200 samples from 8 poultry barns took place in fiscal 2010/11, with a further surge capacity test planned for winter 2011.

Veterinary Clinical Education Program

VCEP funding supports the following initiatives which are critical components in the development of the OVC's Integrated Plan and maintenance of full accreditation status. (http://www.ovc.uoguelph.ca/dean/planning/doc/Integrated_Plan_2009_07_13.pdf)

An "Environmental Scan" of VCEP was held on May 27, 2010. The session was attended by representatives from the University and OMAFRA (both directly and indirectly associated with VCEP) and was facilitated by Mr. Bryan Boyle. Three discussion groups were organized to consider each of the three major VCEP themes: capacity and outreach, clinical training programs and new initiatives.

The overall results were positive, with the program seen as having many strengths and meeting its objective of "supporting the economy of Ontario by training professionals skilled in maintaining the health and welfare of animals and their interrelationships with people and the environment".

Numerous and diverse challenges were identified for VCEP, especially in the face of limited resources. Significant infrastructure spending and capital projects have been required to maintain accreditation, e.g. a new Clinical Skills Facility to be built. For OVC to remain a fully accredited veterinary college and to attract and to retain qualified food animal veterinarians and graduate students, state-of-the-art equipment and teaching facilities are critical. VCEP strategic funding has been a valuable resource to ensure the success of these efforts.

VCEP offers new opportunities in both its core programs and through new initiative funding. Further financial support for increased training opportunities for graduating veterinarians is seen as an improvement and will encourage prospective graduates to pursue careers as food animal practitioners.

The various VCEP program enhancements underway - in Rural Veterinary Track and a Food Animal Track - are considered significant positive developments (see following section of this report), and the group felt strongly that primary care experiential learning opportunities in food animal settings need to be continually supported and enhanced.

The group recognized that with the inception of CPAZ and the MPH programs (see below), OVC is responding to the greater awareness of veterinary medicine's role in public health. While there are also increasing opportunities for post-graduate study in areas of relevance to OMAFRA, continuing inflationary pressures must be managed appropriately if the OVC is to maintain its national and international status and accreditation.

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 OVC's Integrated Plan.

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

The Centre held its public opening on May 4, 2009 which was attended by people from academia, government, and the public. This was followed by a scientific symposium held on

May 5th. There were over 170 attendees at the symposium from a wide variety of animal and human health organizations talking about challenges and opportunities in public health.

The Centre for Public Health and Zoonoses received \$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. "There are a lot of people working on public health issues," Dr. Jan Sargeant, Director of CPHAZ, said. "The CFI funds will provide unique resources aimed at enhancing collaboration between basic scientists and field researchers. Zoonotic diseases are complex and finding solutions will require scientists from all disciplines working together".

In conjunction with the Canadian Association of Veterinary Epidemiology and Preventive Medicine, the CPHAZ held a conference May 29-30, 2010 titled - *Towards One Health: Multiple Disciplines Working Together for Optimal Health of People, Animals and the Environment*. The conference was organized by the Laboratory for Foodborne Zoonoses, Public Health Agency of Canada, in collaboration with the Department of Population Medicine, University of Guelph. The theme for Day 1 was: One Health: People, Animals and the Environment and the theme for Day 2 was: Veterinary Aspects of Public Health: Animal Health and Welfare.

On January 25, 2010, Dr. Claire Jardine (Pathobiology department) accompanied ten veterinary students from OVC to join veterinary students from across North America to participate in Veterinary Student Day at the Centers for Disease Control and Prevention in Atlanta, Georgia. Through presentations and interactive sessions students learned about the essential role that veterinarians play in all aspects of public health. Students also had the opportunity to meet and interact with a variety of public health experts and learn about career paths for veterinarians in public health.

In March 2009, Dr. Jan Sargeant and DVM student, Tyler O'Neill, attended the American PreVeterinary Medical Association Symposium in Urbana, Ill. They spoke on the emerging role of veterinarians in public health with pre-veterinary students in the US. This was the first time a Canadian vet school has presented at this conference.

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. 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. The fall 2009 cohort was comprised of 15 full-time and 2 part-time students of which 3 were veterinarians. For the fall 2010 cohort, there were 113 applicants for an increased enrollment of 20 places (19 full-time, 1 part-time). There are 2 veterinarians in this upcoming class.

Supported by VCEP funding, Dr. Karen Morrison started her four year contractually limited faculty position in May 2010. Her position will support teaching in the MPH program and undergraduate DVM curriculum.

In November 2009, the Master of Public Health program held its first 'Public Health Day'. The first cohort of students presented their experiences in their practicum placements. These placements are an important component of the program where students are placed in a diversity of real-world work settings to apply their newly learned skills under the supervision of a mentor.

Rural Veterinary Practitioner Development

Large Animal Clinical Skills Facility

Two agencies require OVC to house 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 is 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 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 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. Construction of the facility began in May 2010 and is expected to be completed by late fall 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 is finalizing a proposal to develop 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. Currently running is a pilot project where 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.

Over the 2010/11 academic year OVC will be delivering an equine primary care rotation for final year students. Primary care experiential learning in cattle, small ruminants and swine are currently offered through our existing VCEP supported field service clinics. However, there is no 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. This will be a one week hands-on rotation, offered

three times over the year. The supervising faculty will work in conjunction with a few private equine practitioners to provide the students with practical learning opportunities.

In April 2010 the Bovine Education Trust was formally launched. The Bovine Education Trust, a charitable endowment fund established by the Ontario Association of Bovine Practitioners (OABP) and the Ontario Veterinary College (OVC), will provide veterinary students with the real-life learning opportunities and on-the-job experience that they need to develop successful careers serving the dairy and beef industries. Start-up funding is being provided through the Veterinary Clinical Education Program. The trust will help students build confidence and experience by providing support for summer placements with established rural practitioners, extracurricular learning opportunities such as attending conferences, and external electives.

The OVC is partnering with the Dairy Farmers of Ontario, the Ontario Cattlemen's Association, the Ontario Association of Bovine Practitioners, the Ontario Ministry of Agriculture, Food and Rural Affairs to advise and assist the Ontario Veterinary Medical Association in conducting a study of Future Market for Supply of Bovine Veterinary Services. The objectives are: 1) To forecast the demand for bovine and small ruminant veterinary services in the province of Ontario in 2020; 2) To forecast the supply of bovine and small ruminant veterinary services in the province of Ontario in 2020; and 3) To analyze the supply and demand forecasts to determine what (if any) action needs to be taken to address either a province-wide or regional shortage of veterinary services, or an oversupply of veterinary services, for consideration by the parties involved in the study.

OTHER REPORTING

Livestock Inventories

	Opening May 1, 2009	Sold	Died ⁽¹⁾	Transferred		Born or Acquired	Closing April 30, 2010
				in	out		
Alfred							
dairy	79	53	6	0	0	52	72
Kemptville							
dairy	67	28	5	0	0	32	66
New Liskeard							
beef	0	0	0	0	0	0	0
Ridgetown							
dairy	80	21	2	0	0	37	94
beef	29	7	2	0	0	14	34
swine	333	1124	34	25	2	1097	295
Guelph							
Arkell equine	59	0	9	97	102	10	55
Arkell poultry	8,820	0	7,681	2,623	8	3,208	6,962
Arkell swine	1,665	4,388	2,133	0	654	6,896	1,386
Alma aqua	74,441	15,685	34,126	0	7,803	39,002	55,829
Elora dairy	283	99	25	31	52	152	290
Elora beef	530	395	14	273	17	144	521
Ponsonby dairy	95	41	12	36	34	50	94
Ponsonby (GAF) ⁽²⁾	71	144	2	276	133	0	68
Ponsonby sheep	380	159	28		104	286	375
Clinical Studies							
dairy	33	24	1	24	0	0	32

⁽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 2009/10				
<u>Location Name</u>	<u>Opening Balance</u> (May 1, 2009)	<u>Acquisitions</u> (during 09/10)	<u>Dispositions</u> (during 09/10)	<u>Ending Balance</u> (April 30, 2010)
Summary (totals of detailed data, below)				
All OMAFRA Program locations	40,531,372	1,928,535	1,503,762	40,956,145
<u>Individual Locations</u>				
Alfred Campus	989,284	22,600	0	1,011,884
Alma Aquaculture	424,665	0	0	424,665
Arkell Equine	14,000	0	0	14,000
Arkell Feedmill	832,000	0	0	832,000
Arkell Poultry	687,255	0	0	687,255
Arkell Swine	315,000	0	0	315,000
Elora Beef	1,367,110	0	13,000	1,354,110
Elora Dairy	757,500	11,000	0	768,500
Elora Plant Ag.	2,371,475	420,000	405,000	2,386,475
Emo	70,000	0	0	70,000
Guelph RSO	2,543,548	360,500	83,750	2,820,298
Guelph Turfgrass	71,261	14,125	0	85,386
Isolation Unit	0	0	0	0
Kemptville Campus	565,797	0	0	565,797
Bradford Muck Stn	122,000	17,000	0	139,000
NLARS	783,395	37,000	22,000	798,395
Plant Ag. Dr. Mohanty	704,018	0	0	704,018
Ponsonby Dairy	305,000	11,000	0	316,000
PGAF	65,000	14,000	0	79,000
Ponsonby Sheep	41,000	0	0	41,000
Ridgetown Campus	3,329,145	103,452	156,048	3,276,549
Simcoe	525,700	0	20,000	505,700
Thunder Bay	63,000	0	0	63,000
Woodstock	399,986	26,255	56,613	369,628
Vineland	1,858,500	0	61,000	1,797,500
Lab Services	21,325,733	891,603	686,351	21,530,985
<u>Library Resources</u>				
<u>Location</u>	<u>Replacement Value \$</u> <u>('000)</u>			
Alfred	1,645			
Kemptville	1,163			
Ridgetown	1,252			

Proof of Principle Program

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

- i) High rosmarinic acid products originating from mint,
- ii) Genetic markers used to reduce boar taint through breeding and
- iii) Advanced Fruit Color Trait in tomato

Mint

Mentha spicata (spearmint) with ultra high levels of rosmarinic acid, a powerful antioxidant produced by plants, may reduce the effects of various human inflammatory ailments including asthma. The POP funds were used to conduct an *in vitro* study using mint that is high in rosmarinic acid to prove that the mint has anti-inflammatory properties, the results of which would support further *in vivo* studies in horses and in humans. The final step will be to find additional licensing partners for the mint.

The *in vitro* study was successful. When cartilage explants were stimulated with bacterial lipopolysaccharide, the rosmarinic acid mint was found to significantly inhibit inflammatory molecules such as prostaglandin E2 (PGE2). The mint was more effective than a reference anti-inflammatory drug in this study, with respect to inhibiting PGE2 and nitric oxide (NO). The mint also protected against the loss of glycosaminoglycan (GAG), the building blocks of cartilage which are released from cartilage during inflammation, whereas the reference drug accelerated GAG loss.

The success of the *in vitro* study led to the initiation of an *in vivo* study in horses. The study started well, however the final four horses of the 8-horse study reacted too strongly to LPS stimulation so were removed from the study. In order to complete the study, new animal care approvals as well as the acquisition of four additional study animals were required. The second half of the study is underway and results are expected in July 2010.

The results of the *in vivo* study have led to the initiation of a study of human inflammation, being conducted at the University of Guelph Human Nutraceutical Research Unit. This study is in the early stages of development.

The *in vitro* study results were recently published in BMC Complementary and Alternative Medicine (2010, 10:19).

Biomarkers for Boar Taint

This OMAFRA POP grant, in combination with grants from C4 and the Ontario Genomics Institute, supports an ongoing pursuit to identify an expanded set of the most effective genetic markers for the reduction of boar taint in pigs. The results to date are very promising. Genetic markers in boars that express very low levels of androstenone, a steroid and skatole, a foul-smelling compound, both of which 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. Eight genetic lines of pigs were studied. Between 5 and 17 genetic markers were found to have a significant effect on the two compounds that cause boar taint. Based on these markers and depending on the genetic line, the selection of the favourable alleles would result in a 26-61% reduction of androstenone and a 20-53% reduction in skatole. 65% of the markers were associated with both androstenone and skatole.

The DNA from 300 animals from research partner *JSR Genetics* is being genotyped to determine the effect of the markers on their commercial lines. The results of this genotyping will determine whether *JSR Genetics* will continue with the research project on a larger scale.

Advanced Fruit Color Trait in Tomato

The purpose of this OMAFRA POP grant was to determine the genetics of an advanced fruit colour trait in tomato (*Solanum lycopersicum* L.). This trait would result in immature fruit having a pale pink or yellow color, which would be useful in the production of tomato pastes. Based on results from the 2009 growing season, it is thought that the trait is controlled by at least two recessive genes. Studies done in the 2010 growing season will further examine that conclusion and may enable the breeding of an early colouring line of tomatoes. Lycopene and solids analyses are being conducted on tomatoes containing the advanced fruit colour trait in order to determine whether there are any additional benefits of this line. These analyses are expected to be completed in July 2010.

Schedule G

Agriculture and Food Laboratory

During 2009/10 fiscal year, the AFL completed the outstanding Year 1 Milestone of preparing Business Services Baseline Inventory (BSBI) documents for each laboratory area as well as Hazard Identification & Risk Assessment documents on a lab by lab basis. The exercise culminated in the completion of an AFL Hazard Identification & Risk Assessment Report.

The laboratory completed the Year 2 Milestone in August of 2010 thus will be detailed in the next Annual Report.

The Year 3 Milestone requirement is to provide an enhanced Essential Level Continuity Plan including notification and dependencies of critical infrastructure and critical systems. Working in concert with the Animal Health Laboratory and OMAFRA we will develop an Emergency Surge Capacity process. The requirement will be tested through a basic Table Top Exercise involving both organizations.

Animal Health Laboratory

During 2009/10 AHL completed Year 2 Milestone of Schedule G, described on page 129 and in Performance Indicator 'AHL#8'.

Business Development Office – Schedule N

The table below is a listing of relevant intellectual properties licensed and patented under the Agreement as of 2009/10.

Technologies by Inventor		
Inventor / Tech ID	Technology Title	Status
Baird 20011109	JEB diagnostic test for Belgian horses	Licensed
de Lange 20050221	Pig growth model	Licensed
EFI 20080331	Dairy Product	Licensed
Erickson 20010524	Novel Inducible Genes from Alfalfa and Methods of Use Thereof	Patented
Forsberg 19990526	Transgenic animals expressing salivary phytase	Patented
Golovan 20090212	Aptamers for sex selection of bovine sperm	Licensed
Hall 20090311-2	Materials for the production and purification of plant-produced Trastuzumab	Licensed
Hall 20100611	Production of HER receptor antibodies in plants	Disclosed
Holub 19960430	Custom Feed Supplement to Maximize Omega-3 Fatty Acids in Cow's Milk	Patented
Kott 20060221	PRODUCTION OF ROSMARINIC ACID FROM SPEARMINT AND USES THEREOF (mentha spicata clones with ultra high levels of rosmarinic acid (a powerful plant antioxidant-useful for reducing effects of various human inflammatory ailments including asthma)	Licensed
Lencki 20100430	The Development of a Functional DAG Fat	Disclosed
McGurrin 20040402	Pressure and ultrasound-guided cardiac catheter for transvenous electrical cardioversion of equine supra-ventricular cardiac arrhythmias	Licensed
Mckersie 19870324	Process to induce desiccation tolerance in somatic embryos	Licensed
Mckersie 19971215	Enhanced Root Production in Transgenic Perennial Plants	Licensed
Mohanty 20100318	Recycled plastic and biocomposite formulations	Licensed
Nagy 20000817	Porcine Adenovirus Based Vector, Vaccine	Licensed
Nagy 20090723	Vectored vaccines based on the left end genome region of fowl adenovirus 9	Licensing
O'Brien 19900111	Diagnosis for Porcine Malignant Hyperthermia	Licensed

OmegaNutrel 20070713	A Feed Supplement and Use Thereof For Elevating Levels of Essential Fatty Acids in Livestock and Products Therefrom	Licensed
Paliyath 19980831	Inhibition of Phospholipase D activity by C6 Aldehydes and Alcohols	Licensed
Paliyath 20000517	Development of a Novel Antioxidant Formulation to Control Superficial Scald in Apples	Licensed
Plante 20000810	Porcine Embryo Production, Recovery, Maintenance and Transfer Systems for Use in Domestic and International Genetic Transport and the Elimination of Environmental Pathogens in Swine.	Licensed
Prescott 20070405	Protective immunogens against Clostridium perfringens-induced necrotic enteritis in chickens	Licensed
Shewen 19850207	Vaccine for Prevention of Pasteurella haemolytica pneumonia in Cattle.	Licensed
Zheng 20100423	Growth Substrates	Licensed

APPENDIX A

SPARK Research Stories with OMAFRA Sponsorship 2009/10

Research news articles can be accessed from:

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.

All SPARK media materials acknowledge the support of the OMAFRA/UofG Partnership in funding of the subject material presented.

In Print

The University of Guelph, *Research Magazine*: *Research* magazine highlights the University's diverse research strengths in a concise news format. Published three times a year, each issue focuses on a specific area of research activity. *Research* is written and produced by SPARK, which also produces videos for the magazine's electronic version.

Summer 2009 issue Agri-Food Yearbook

Making pork even healthier

Researcher: Kees de Lange, Dept. of Animal and Poultry Science

Super spearmint

Researcher: Laima Kott, Dept. of Plant Agriculture

Five years strong for Dairy Oh! milk

Researcher: Brian McBride, Dept. of Animal and Poultry Science

Fruit that fights disease

Researcher: Jay Subramanian, Dept. of Plant Agriculture

Omega-3 chicken about to hatch

Researcher: Steve Leeson, Dept. of Animal and Poultry Science

An edge for Ontario apple growers

Researcher: John Cline, Dept. of Plant Agriculture

Soup for pigs: the line begins to form

Researcher: Kees de Lange, Dept. of Animal and Poultry Science

Toward better breathing

Researcher: Dorothee Bienzle, Dept. of Pathobiology

A smoother way to go organic

Researcher: Jim Fisher, Kemptville Campus

A facelift for filters

Researcher: Chris Hall, Dept. of Environmental Biology

If you can't beat it, adsorb it

Trevor Smith, Dept. of Animal and Poultry Science

The meat of the matter

Researcher: Stephen Miller, Dept. of Animal and Poultry Science

New advances for Ontario's biggest crop

Researcher: Peter Pauls, Dept. of Plant Agriculture

A greener way to go

Researcher: Larry Erickson, Dept. of Plant Agriculture

Oil from the soil

Researchers: Gary Ablett, Ridgetown Campus and Istvan Racjan, Dept. of Plant Agriculture

Rye mat roll means weed control

Researcher: Darren Robinson, Ridgetown Campus

Discovery and development in bioproducts

Researchers: Manju Misra, School of Engineering and Amar Mohanty, Dept. of Plant Agriculture

Supporting local food from Ontario farms

Researcher: Karen Landman, School of Environmental Design and Rural Development

Farmers adapt as cities grow

Researchers: Brady Deaton and Alfons Weersink, Dept. of Food, Agricultural and Resource Economics

Working together for better water

Researcher: Wayne Caldwell, School of Environmental Design and Rural Development

Shades of grey

Researcher: Katerina Jordan, Dept. of Plant Agriculture

Premium compost

Researcher: Ron Fleming, Ridgetown Campus

Pollutants take flight

Researcher: Bill Van Heyst, School of Engineering

Climate change, what a pest

Researcher: Jonathan Newman, Dept. of Environmental Biology

In pursuit of a coccidian vaccine

Researcher: John Barta, Department of Pathobiology

Against the wind

Researcher: Istvan Rajcan, Dept. of Plant Agriculture

Winter 2010 issue

One world, one approach to health

Researcher: Jan Sargeant, CPHAZ

Ontario Cattleman's Association (OCA) – Ontario Beef magazine: *SPARK writes beef-focused research articles for the monthly Ontario Beef magazine, with each article 500 words in length. The Ontario Cattlemen's Association publishes Ontario Beef.*

Beef genetics for breeding and selection

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

Published: October 2009

Research intern evaluating key performance indicators

Researchers: Michael Weber and Maury Bredahl, Dept. of Food, Agricultural and Resource Economics

Published: December 2009

Grain Farmers of Ontario (GFO): *the Ontario Soybean Growers, the Ontario Corn Producers' Association and the Ontario Wheat Producers' Marketing Board have now amalgamated to create the Grain Farmers of Ontario. SPARK writes research news briefs for the Grain Farmer magazine*

Prior to amalgamation: Ontario Corn Producers

The bug blog

Researcher: Tracey Baute, OMAFRA

Published: September 2009

Biosensor bacteria

Researcher: Manish Raizada, Dept. of Plant Agriculture

Published: September 2009

Dry vs. liquid starter

Researcher: Greg Stewart, Dept. of Plant Agriculture

Published: September 2009

Prior to amalgamation: Ontario Wheat

Planting more seeds key to reducing losses from harsh winters

Researcher: Peter Johnson, OMAFRA

Published: Autumn 2009

Wheat straw yields

Researcher: John Rowsell, New Liskeard Research Station

Published: Autumn 2009

Fusarium fungicide field trial pilot

Researcher: Peter Johnson, OMAFRA

Published: Autumn 2009

Grain Farmer Magazine

Improved soy variety

Researcher: Gary Ablett, Ridgetown Campus

Published: October 2009

Red wheat sensory characteristics

Researcher: Lisa Duizer, Dept. of Food Science

Published: October 2009

FHB resistant wheat

Researcher: Duane Falk, Dept. of Plant Agriculture

Published: November 2009

Stopping the spread of waterhemp

Researcher: Peter Sikkema, Ridgetown Campus

Published: December 2009

Healthy breads

Researcher: Terry Graham, Dept. of Human Health and Nutritional Science

Published: December 2009

Soil test

Researcher: Bill Deen, Dept. of Plant Agriculture

Published: January 2010

Value added distillers grains

Researcher: Amar Mohanty, Dept. of Plant Agriculture

Published: November 2009

Soybean variety could impact fungicide application decisions

Researcher: Chris Gillard, Ridgetown Campus and Albert Tenuta, OMAFRA

Published: February 2010

A new twist on corn starch

Researchers: Elizabeth Lee, Dept. of Plant Agriculture; Mike Emes, Dept. of Biological Science; Ian Tetlow, Dept. of Molecular and Cellular Biology; Terry Graham, Dept. of Human Health and Nutritional Science

Published: February 2010

Beating bean leaf beetles

Researcher: Rebecca Hallett, School of Environmental Sciences and Art Schaafsma, Ridgetown Campus

Published: April 2010

Planting wheat using the best technique

Researcher: Peter Johnson, OMAFRA

Published: May 2010

Ontario Milk Producer – the Milk Producer magazine: *The Milk Producer magazine is the monthly publication of the Dairy Farmers of Ontario. SPARK provides one 500-word research article as opportunities, such as new research grants and other activities, arise.*

Raw milk

Researcher: Keith Warriner, Dept. of Food Science

Published: October 2009

Fibre-fortified dairy products

Researcher: Doug Goff, Dept. of Food Science

Published: November 2009

Up Close

Researcher: Brian McBride and Ousama Alzahal, Dept. of Animal and Poultry Science

Published: March 2010

Natural Solutions

Researcher: Simon Lachance, Alfred Campus

Published: May 2010

CFBMC: *The Canadian Farm Business Management Council is the only national organization in Canada devoted exclusively to developing and distributing advanced farm management information. SPARK writes one 500-word article periodically.*

New land use approach protects species and owner.

Researcher: Glen Fox, Department of Food, Agricultural and Resource Economics

Published June 18/09

Evapotranspiration

Researcher: John Warland, School of Environmental Sciences

Published: September/October 2009

University seeks producer opinions for sheep and goat researchers

Researcher: Andria Jones, Dept. of Population Medicine

Published: February 2010

Guelph Millennium asparagus

Researcher: David Wolyn, Dept. of Plant Agriculture

Online: March 2010

Ontario Fruit and Vegetables Association - The Grower: *The Grower is a national, horticultural publication, and is published monthly by the Ontario Fruit and Vegetable Growers' Association.*

Rye mat roll means weed control

Researcher: Darren Robinson, Ridgetown Campus
October 2009, p. 17.

Owen Roberts. *Since Owen Roberts' appointment with OMAFRA-UofG Partnership, he has written several of his weekly columns, Urban Cowboy, in the Guelph Mercury and the Woolwich Observer, about the Partnership.*

Centre for human animal disease is timely

Woolwich Observer, 15 – May 2, 2009

Guelph Mercury, A2 – May 5, 2009

On the road displays a credit to farming

Woolwich Observer, 15 – September 5, 2009

Guelph Mercury, A8 – September 8, 2009

Political courage is needed to solve world hunger

Woolwich Observer, 15 – November 14, 2009

Guelph Mercury, A8 – November 16, 2009

It's not junk food if taken in moderation

Woolwich Observer, 15 – December 12, 2009

Guelph Mercury, A8 – December 14, 2009

Farmers understand the need for research.

Woolwich Observer, 15 – January 23, 2010

Guelph Mercury, A8 – January 25, 2010

Soil scientist standing up to invasive species

Woolwich Observer, 15 – February 6, 2010

Guelph Mercury, A8 – February 8, 2010

Ontario deserves gold for bio products research

Woolwich Observer, 15 – February 27, 2010

Guelph Mercury, A8 – March 1, 2010

Traceability is the new concern for exporters

Woolwich Observer, 15 – March 20, 2010

Guelph Mercury, A8 – March 22, 2010

New technology will help us feed the world

Woolwich Observer, 15 – April 17, 2010

Guelph Mercury, A8 – April 19, 2010

Technology and innovation will be driven by the hungry world

The Grower. August 2009, p. 8.

Must you choose function over profit?

The Grower. October 2009, p. 7.

Blame your diet not your food for extra inches
The Grower. January 2010, p. 8.

Broadcast

SPARK*AIR Video Broadcasts

Asparagus research

Researcher: David Wolyn
Farms.com - July 6, 2009

Hazelnuts in Ontario

Researcher: Adam Dale
Farms.com - July 13, 2009

Winter survival in grapes

Researcher: John Zandstra
Farms.com - July 20, 2009

Solving Tarspot in maple trees

Researcher: Tom Hsiang
Farms.com - July 27, 2009

Reducing ammonia in poultry barns

Researcher: Steven Leeson
Farms.com - August 3, 2009

Controlling weeds without pesticides

Researchers: Katerina Jordan, Eric Lyons and Francois Tardiff
Farms.com August 10, 2009

Nitrogen needs for wheat

Researcher: Dave Hooker
Farms.com - August 17, 2009

Controlling weeds in corn

Researcher: Clarence Swanton
Farms.com - August 24, 2009

Ethnic vegetables

Researcher: Alan Mckeown
Farms.com - August 31, 2009

Colourful carrots

Researcher: Mary Ruth McDonald
Farms.com - September 14, 2009

Lengthening the strawberry season

Researcher: Adam Dale
Farms.com - September 28, 2009

First Local, Rogers Television Guelph – April 9, 2010

Growing more tolerant peaches

Researcher: Jay Subramanian

Farms.com - October 12, 2009

First Local, Rogers Television Guelph – February 26, 2010

Solving storage rot in carrots

Researcher: Greg Boland

October 26, 2009

Blind chickens

Researcher: Gregoy Bedecarratts

Farms.com - November 9, 2009

Learning more about consumer senses

Researcher: Isabelle Lesschaeve

Farms.com - November 23, 2009

Preventing lameness in cattle

Researcher: Janet Higginson

Farms.com - January 11, 2010

Making potatoes healthier

Researcher: Rickey Yada

Farms.com - February 1, 2010

Making dessert healthy

Researcher: Doug Goff

Farms.com – February 22, 2010

First Local, Rogers Television Guelph – April 30, 2010

Making Money from Manure

Researcher: Youbin Zheng

Farms.com – March 15, 2010

Saving nitrogen costs

Researcher: Manish Raizada

Farms.com - April 5, 2010

First Local, Rogers Television Guelph – June 11, 2010

Making plastic from biodiesel by-products

Researcher: Amar Mohanty

Farms.com – April 26, 2010

First Local, Rogers Television Guelph – May 19, 2010

SPARK AWARDS

2010

Silver Award: for photography, Critique and Awards Program from Association for Communication Excellence in Agriculture, Natural Resources and Life and Human Sciences.

Silver Award: for best magazine, Critique and Awards Program from Association for Communication Excellence in Agriculture, Natural Resources and Life and Human Sciences.

Silver Award: for print advertisements Critique and Awards Program from Association for Communication Excellence in Agriculture, Natural Resources and Life and Human Sciences.

Silver Award: for illustration, Critique and Awards Program from Association for Communication Excellence in Agriculture, Natural Resources and Life and Human Sciences.

Bronze Award: for logo development, Critique and Awards Program from Association for Communication Excellence in Agriculture, Natural Resources and Life and Human Sciences.

Bronze Award: for writing for newspapers, Critique and Awards Program from Association for Communication Excellence in Agriculture, Natural Resources and Life and Human Sciences.

Runner-up: for online radio reporting by SPARK Writer Natalie Osborne from International Federation of Agriculture Journalists.

2009

Silver Award: for best television reporting by SPARK Writer Arthur Churchyard from Canadian Farm Writers Federation

Silver Award: for technical writing, Heidi Thiessen Memorial Award for Student Writing from the Society for Technical Communications.

Bronze Award: for best radio news reporting by SPARK Writer Natalie Osborne (SPARK/CKNX radio) from Canadian Farm Writers Federation.

APPENDIX B

2009/10 Revisions to Agreement Performance Indicators

The following revisions were recommended by the Agreement Program Management Committees and approved by the Agreement Executive Committee September 18, 2009

Agreement Schedule and Committee	PI #	Original Performance Indicator	Measurement / Metric	Proposed and Approved Change
Schedule B Research	#4b)	Scientific merit and relevance of research projects in each research theme area supported through the Agreement	Total # of publications in peer reviewed journals and % of those appearing in high impact journals.	Delete reference to 'bibliometric studies' under 'Methodology' and 'Potential Data Sources', as it doesn't add value to this PI.
Schedule B Research and Schedule N Intellectual Property	#8 #1	Patents, products*, licences to existing or start-up companies, existing businesses spun out and community-based services businesses created, and the economic impact.	a) Number of disclosures, b) patent applications filed, c) licence granted, d) patents issued & products introduced (trailing), e) total dollar value of revenue generated from licences associated with OMAFRA supported research, f) three brief case studies of individual files from difference themes and initiatives taken to advance commercialization.	Add 'by research theme' to each metric a) to e). To 'products' in PI, add: (technologies, software, germplasm, registered trademarks, copyright).
Schedule E AHL	#1b)	Participation and contribution of surveillance information to relevant national and provincial bodies or committees that inform federal/provincial animal health strategies.	b) Level of customer satisfaction with services provided by AHL program, by commodity.	Move #1b) to #4 which deals with AHL client satisfaction survey.
Schedule E AHL	#1c)	Participation and contribution of surveillance information to relevant national and provincial bodies or committees that inform federal/provincial animal health strategies.	New: c) Percentage of available working time spent participating on federal/provincial animal health strategy committees	Add #1c) to quantify the participation and contribution of AHL personnel. It is a more meaningful measure than strictly the number of staff participating.

Schedule E AHL	#5	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.	b) Utilization of AHL by third party sources.	Reporting on this metric will be very general to ensure client confidentiality and market competitiveness. No target will be set.
Schedule E AHL	#6	The University maintains appropriate accreditations at the Animal Health Lab, but not limited to AAVLD, CFIA, and ISO registration.	New: b) Review of client satisfaction survey in order to assess performance New: c) Review of actual adherence to published turnaround times New d) Review of proficiency testing results to assess performance	Add 6b, c) and d) because they are all factors considered in accreditation of the AHL.
Schedule G AHL	#8	Emergency response plans are effectively implemented in response to emergency animal health incidents.	New b) Adherence to the milestones in Schedule G (Emergency Response)	Add b) to address AHL requirements of Schedule G.
Schedule I Records Inventory AHL	NA	Information consisting of: Diagnostic and submission forms data from tests and diagnostics conducted at the AHL. May include bio-security data in future. Information consisting of: AHL result reports – Sapphire database and its successor reporting to FSDSS.	NA	Current retention period: 20 years Proposed and approved retention period: 10 years
Schedule I Records Inventory AFL	NA	Testing results – Sapphire and FSDSS databases and their successors.	NA	Current retention period: 20 years Proposed and approved retention period: 10 years
Schedule F AFL	#3	Proportion of tests completed and communicated within specified time frames required for actionable response.	Percentage of positive test screen results that are completed /communicated within required timeframes by program.	Change Performance Indicator to: 'This measure will track and review incident reports (LabTrack) and report all non-conformances, their resolution and any continuous improvement initiatives.' Change Metric to: 'LabTrack reporting of all non-conformances'.

* 'products' added back into PI and defined; approved by Executive Committee Dec 18, 2009

APPENDIX C

OMAFRA/UofG Audited Statement of Revenues and Expenses

UNIVERSITY OF GUELPH OMAFRA AGREEMENT

Annual Financial Report

Audited Financial Statements for the fiscal year May 1, 2009 to April 30, 2010

September 20, 2010

Auditors' Report

To the Ministry of Training, Colleges and Universities

We have audited the accompanying statement of revenue and expenses of the **University of Guelph – OMAFRA Programs** for the year ended April 30, 2010 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, 2010 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, 2010
(in thousands of dollars)

	OMAFRA Programs					Total OMAFRA 2010	Total OMAFRA 2009
	Research	Vet Clinical Education	Agri-food Laboratory	Animal Health Laboratory	Minor Capital Repairs		
Income							
Provincial	41,487	5,317	3,914	7,025	5,365	63,108	62,930
Tuition	0					0	0
Sales of Goods and Services	3,809		10,144	3,505		17,458	16,879
Investment Income	201					201	1,622
Other	1,405		10	6		1,421	1,890
Total Income	46,902	5,317	14,068	10,536	5,365	82,188	83,321
Expenses							
Personnel Costs	19,545	1,844	8,522	7,387	16	37,314	38,097
Support for Faculty Costs	9,915	1,900				11,815	11,815
Operating	11,448	1,468	5,786	4,411	5,349	28,462	28,865
Internal Recoveries	(3,415)		(527)	(1,461)		(5,403)	(5,456)
Service Costs	9,409	105	287	199		10,000	10,000
Total Contract Expenses	46,902	5,317	14,068	10,536	5,365	82,188	83,321
Net Income (Expense)	-	-	-	-	-	-	-

UNIVERSITY OF GUELPH
ONTARIO MINISTRY OF AGRICULTURE, FOOD AND RURAL AFFAIRS AGREEMENT
NOTES TO THE FINANCIAL STATEMENTS
FOR THE TWELVE MONTHS ENDED APRIL 30, 2010
(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, 2010
(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>2010</u>	<u>2009</u>
Opening Balance	14,621	12,204
Funds Received	59,100	59,100
Expenditure	<u>(57,243)</u>	<u>(56,683)</u>
Ending Balance	<u><u>16,478</u></u>	<u><u>14,621</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 is utilized during a five year period starting May 2008 and ending April 2013. As of April 30, 2010, \$9,595 has been spent leaving a balance of \$46,405.

The expenditures were spent in the following OMAFRA programs:

	<u>2010</u>	<u>2009</u>
Research	3,698	3,197
VCEP	522	222
Animal Health Lab	<u>1,614</u>	<u>342</u>
	<u><u>5,834</u></u>	<u><u>3,761</u></u>