# Ontario Ministry of Agriculture, Food and Rural Affairs

and

# University of Guelph

Agreement

# Consolidated Annual Report 2013/2014

University of Guelph

Ontario

## Table of Contents

Executive Summary ..... 3

Selected Program Highlights (2013/14) In Brief ..... 4
- Agriculture and Food Laboratory Program ..... 4
- Animal Health Laboratory Program ..... 4
- Research Program ..... 5
- Veterinary Clinical Education Program ..... 6

Highlights and Updates (2013/14) ..... 7
- Agriculture and Food Laboratory Program Highlights ..... 7
- Animal Health Laboratory Program Highlights ..... 11
- Research Program Highlights ..... 14
- Veterinary Clinical Education Program Highlights ..... 18

Financial Report ..... 20

Program Performance Reports ..... 28
- Overall Agreement ..... 28
- Agriculture and Food Laboratory ..... 35
- Animal Health Laboratory ..... 43
- Research Program ..... 72
- Veterinary Clinical Education Program ..... 106

Schedule G: Business Continuity, Emergency Response and Surge Capacity Planning 111
- Agriculture and Food Laboratory ..... 111
- Animal Health Laboratory ..... 111

Schedule N: Joint Intellectual Property (OMAFRA and U of G) ..... 113

Appendix A–1: Licensed Technologies by Inventor ..... 113
Appendix A-2: OMAFRA Funded Technology Results ..... 116
Appendix A-3: Most Significant Royalty-Bearing Germplasm Varieties ..... 116
Appendix A-4: Proof of Principal (POP) Funded Research Projects ..... 117
Appendix B: OMAFRA - U of G Audited Statement of Revenues and Expenses ..... 118

# 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 (U of G) Agreement (also known as the OMAFRA-U of G Partnership). This is the sixth annual report under the current Agreement between the University of Guelph and OMAFRA that was signed April 1, 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 reporting period of this annual report is the U of G's 2013/14 fiscal year (May 1, 2013 – April 30, 2014). The report covers the activities, budgets, expenditures and performance measures for each of the four program areas of the Agreement: Research, Veterinary Clinical Education Program (VCEP), Animal Health Laboratory (AHL) and the Agriculture and Food Laboratory (AFL) programs.

In the Agreement's ten year term, 2013/14 marks the beginning of the second five years. At this point, the decision was made to abridge the format and content of the annual report to make it more reader-friendly and to avoid duplication in reporting that was largely unchanged from year to year. Much of the information that has been contained in the annual reports is now readily available on-line. Therefore, beginning 2013/14, only highlights and updates to the Agreement programs are reported.

Further details concerning the Agreement are available at:
http://www.uoguelph.ca/omafra_partnership/en/omafrauofgpartnership.asp

The OMAFRA-U of G Agreement annual reports are posted at:
http://www.uoguelph.ca/omafra_partnership/research/en/researchresult/ReportsAndPublications.asp

# SELECTED PROGRAM HIGHLIGHTS (2013/14) IN BRIEF

After a comprehensive five year review of the Agreement in 2012/13, funding for the second five year term of the Agreement was confirmed by OMAFRA in Jan. 2013 at $71.3 M annually, including $3.5 M of 'Growing Forward' funding. (GF2 is a federal-provincial-territorial initiative.) This amount is relatively unchanged from the first five years.

During 2013/14, OMAFRA and U of G worked together to fine-tune the funding allocations to the four Agreement programs for the second five year term. The discussions were shaped by the need to the better align some program elements with OMAFRA priorities. The agreed-upon final allocations are shown in the Financial Reporting section of this report. They are not anticipated to change going forward, and therefore constitute the financial plan for 2014/15.

Reported below are selected highlights from each of the four Agreement programs during 2013/14. More comprehensive updates, budgets and performance indicators for each of the programs are available in the following sections of this report.

## Agriculture and Food Laboratory Program

In 2013/14, the AFL began testing for neonicotinoid residues in OMAFRA's 'Foods of Plant Origin' and 'Horticulture Technology' testing programs. This was part of the expanded scope of residues that support the 'Canadian Chemical Residue Determination in Fresh and Processed Fruits and Vegetables', and are part of OMAFRA's pesticide residue testing programs.

In ongoing collaboration with federal and provincial regulatory partners, the AFL continued to expand its expertise with a simple, rapid and standardized DNA fingerprinting methodology and database that makes possible the tracking of contamination sources of *Listeria monocytogenes.* The database now contains almost 4000 *Listeria* isolates. The same technique developed for *Listeria* is now being applied to other pathogens such as *Salmonella*.

## Animal Health Laboratory (AHL) Program

For the Ontario swine industry, the Porcine Epidemic Diarrhea outbreak was a significant disease event that began in Jan. 2014. Based on emergence of PED in the USA in May 2013 and its subsequent northward tracking, its arrival in Ontario was anticipated. Through the actions of the industry in heeding OMAFRA's recommendations for biosecurity, and the AHL's testing capacity readied in advance, the disease's impact in Ontario was mitigated. By the end of 2013/14, the AFL had conducted approximately 13,000 PEDV tests (including environmental testing).

At the same time, AHL also undertook another major initiative that will continue until 2018, the Disease Surveillance Plan for Ontario. A key component of the DSP has been the development of cross-sector networks of veterinarians, species pathologists, researchers, and government specialists to share data and observations from laboratory data and clinical

impressions from veterinarians. The cross-sector networks will help to improve preparedness, detection and response to animal diseases.

## Research Program

Funding was restored to all seven research themes in the Fall 2013 call for research proposals. It had been temporarily reduced in 2012 while the five year review of the Agreement was undertaken.

Investment in the Agreement's research program continued to leverage external third party funding. For 2013/14, the ratio of leveraged research operating funds was 2.1:1 or $11.2 million of third party (non-Ontario government funds) leveraged by OMAFRA's $5.4 million of research operating funding.

In 2013/14, much progress was made in construction of the Livestock Research and Innovation Centre - dairy phase at Elora, and planning for greenhouse construction at the Vineland Research and Innovation Centre. Both are funded through the Agricultural Research Institute of Ontario's research infrastructure strategy which is providing the modern research capacity needed for an innovative and competitive agri-food industry.

### Knowledge Translation and Transfer (KTT)*

Mobilizing research results from the lab to knowledge and technology users continued to be a focus of the Agreement in 2013/14. Through a competitive process, funding was awarded to projects that would most effectively communicate research results to targeted users. One example was the development of a smartphone app for dairy farmers that employs research findings to help them to better manage ketosis in their dairy herds. Since 2008/09, 64 completed projects and 4 active ones have helped to make research results available and understandable to industry and other knowledge users.

### Commercialization*

The U of G's 'Catalyst Centre' provides expertise in the management of intellectual property (IP), generated from Agreement-funded research. The development of new plant germplasm is a significant generator of IP. Total returns from plant IP technologies since 1977 surpassed $12.2 million in 2013/14. The returns are reinvested back into further plant research. It is noteworthy that the $12.2 million represents only a fraction of the billions of dollars that have resulted from sale of the seed, crops, and value-added plant products.

A new research commercialization program, 'The Gryphon's LAAIR', was launched in 2013/14 to help move products and knowledge with commercial potential closer to market. Through a competitive process, eight proposals were selected, including a collaborative one with a private sector nursery to transfer accelerated apple root stock cultivation technology. Another project assessed the capacity of Ontario starch industry to adopt new technology involving novel enzymes.

(Note: 'LAAIR' is an acronym meaning *Leading to Accelerated Adoption of Innovative Research*)

**Highly Qualified Personnel (HQP)***

The Agreement has funded the development of graduate students with specialized training in agri-business, research and innovation so that they can bring a greater understanding of these to both the laboratory and the marketplace. The HQP program complements the Research Infrastructure Strategy as both expertise and infrastructure are needed for modern research capacity. Since 2008/09, 110 students and their employers have benefitted from the HQP program.

*** Note**: Although most of the KTT, commercialization and HQP initiatives occurred within the Agreement's Research Program in 2013/14, the Animal Health Lab, Agriculture and Food Lab and Veterinary Clinical Education programs also included KTT and HQP components. In the financial tables of this report they are shown as 'Growing Forward 2' or 'Fund 112'. GF2 is a federal-provincial-territorial initiative.

## Veterinary Clinical Education Program (VCEP)

The Centre for Public Health & Zoonoses (CPHAZ), funded in part by the OMAFRA – U of G Agreement (through VCEP) hosted the 2013 international meeting of *Rabies in the Americas*. It is the longest running and largest rabies conference in the world. A special 2014 issue of the journal *Zoonoses and Public Health* highlighted the work of the CPHAZ director, Dr. Jan Sargeant, in applying evidence-based practice and systematic reviews to animal health and zoonotic disease.

Also through VCEP, the Ontario Veterinary College's Doctor of Veterinary Science students conducted research in priority areas of livestock health, for the benefit of the livestock industry and Ontario consumers. Examples in 2013/14 included: epidemiology of swine influenza on Canadian swine farms, and the role of European starlings in the epidemiology of zoonotic and antimicrobial resistant pathogens in dairy farms.

# HIGHLIGHTS AND UPDATES (2013/14)

## Agriculture and Food Laboratory Program Highlights

The AFL is part of the U of G's Laboratory Services Division. Further information about the division can be found on the University website.

In 2013/14 the AFL continued the implementation of innovative test approaches and other initiatives that benefit the OMAFRA-University of Guelph Agreement and the Ontario Ministry of the Environment - Climate Change Program:

- AFL maintains a high industry profile in the use of molecular techniques. The Lab continued to collaborate on the project below involving OMAFRA, Public Health Ontario, Health Canada, the Public Health Agency of Canada, the Canadian Food Inspection Agency and the Ontario Ministry of the Environment.

  The use of a Multi-Locus Variable Number Tandem Repeat Analysis (MLVA) methodology and ongoing contributions to a database using a combined culture bank now totaling *nearly 4000 Listeria* isolates, has proven to be quite valuable. It has contributed to the research project and provided the highest level of confidence to the work performed at the AFL for the OMAFRA programs. MLVA has also been applied to other pathogens such as *Salmonella*. This "leading edge", advanced level technological expertise sets the AFL apart from its peers.

- The expanded scope of residues that support the annual Canadian Chemical Residue Determination in Fresh and Processed Fruits and Vegetables is now established and successfully applied to OMAFRA's pesticide residue programs in this year. In 2013/2014, neonicotinoid residues were also incorporated into the Foods of Plant Origin and Horticulture Technology testing programs at OMAFRA.

- The AFL successfully completed the fourth of a five-year contract for raw milk testing in Ontario. The lab tests over 800,000 samples annually and works closely with the Dairy Farmers of Ontario (DFO), the Ontario Dairy Council (ODC) and OMAFRA to support any program issues that may arise periodically in this industry.

- The AFL laboratory scientists continue to work closely with OMAFRA Dairy Food Safety Program staff to develop testing programs that benefit all species in the dairy industry including the growing sheep milk industry. New residue screening tests have been validated for use in both goat and sheep milk that were previously unavailable.

- The AFL multi-residue methods continued to be improved upon and expanded to include regulatory testing of drug, pesticide and mycotoxin residues in the considerable variety of matrices received from OMAFRA including animal tissues and milk across several species, as well as fruits and vegetables and grains/feeds.

- In 2013/2014 the AFL developed methods for the simultaneous detection of drug residues specifically for use in goat milk using this same high-level technology. This marked the first opportunity for OMAFRA to survey goat milk samples for these drug classes at this level of scrutiny. The AFL is currently working on new

technologies that will increase the capacity of this methodology and the response time to as close to real time as possible. This is important when regulatory action from OMAFRA is required. Through these activities, OMAFRA continues to reap the benefit of the AFL's position as the only non-government lab in Canada to hold accreditation that permits the application of non-routine testing to client samples under defined conditions.

- AFL continued to look for niche sector opportunities that are critical to the success of the leveraging strategy needed to secure sufficient revenue to sustain the Laboratory Services Division as a whole. To this end, the AFL continues to build important relationships and revenue with the private sector including the bundling of complementary services for the purpose of food contaminant and/or adulteration investigations.

**AFL Advancements in Molecular Biology and Microbiology**

In an ongoing collaboration with regulatory partners, the AFL continued to refine and expand expertise with a simple, rapid, accurate and standardized DNA fingerprinting methodology (MLVA) and database that facilitates tracking contamination sources of *Listeria monocytogenes* in the "farm to fork" continuum. (S. Saleh-Lakha, V. Allen, J. Li, F. Pagotto, J. Odumeru, E. Taboada, M. Lombos, K.C. Tabing, B. Blais, D. Ogunremi, G. Downing, S. Lee, A. Gao, C. Nadon and S. Chen*. "Molecular subtyping of a large collection of historical Listeria monocytogenes strains using an improved Multi-Locus Variable-Number Tandem Repeat Analysis (MLVA)". Manuscript submitted to Applied and Environmental Microbiology.)

As genome sequencing continues to expand, it is anticipated that these MLVA profiles will become part of a global pathogen multi-database initiative to serve epidemiological efforts around the world. Results obtained from this testing continue to provide a better understanding of the genetic composition and the distribution of these organisms in Ontario. This method continues to be applied to OMAFRA programs, further enhancing food safety surveillance within Ontario.

**Pesticide Testing**

During the course of a non-Schedule "F" project, the AFL worked with an industry group as well as with the CFIA to install a method for the determination of neonicotinoids and related compounds in bee related matrices. As a result, the AFL has incorporated this testing into OMAFRA's programs for Ontario in 2013/14. This further supports OMAFRA's desire to remain aligned with the national testing programs.

Through work with both the Canadian Food Inspection Agency (CFIA) and Agriculture and Agri-Food Canada (AAFC), AFL leveraged its expertise and resources in pesticide testing to the benefit of OMAFRA. The AFL maintains Standards Council of Canada accreditation status that states the AFL complies with requirements of OECD Principles of Good Laboratory Practice (GLP) 1998. This accreditation allows the AFL to work on behalf of the AAFC to verify characteristics of new pesticides coming to market. Knowledge gained through this can be applied to testing when these compounds come to routine use in the agricultural sector.

Dr. Linda Lissemore, Manager, AFL Chemistry Unit, works collaboratively with University of Guelph researchers from Environmental Biology within the School of Environmental Sciences on a number of research studies. This work further establishes the AFL as experts in the area of pesticide residue chemistry and expands the scope of services that LSD is able to provide to OMAFRA.

**Dairy Testing**

*Raw Milk Contract*

The Agriculture and Food Laboratory has successfully completed the fourth of a five-year, renewable contract to provide both analytical and program management support for the collection, testing and reporting of results for raw milk composition and quality program samples in Ontario. The lab tested over 800,000 samples producing more than 4 million test results for these samples.

Analytical testing information and quality testing for regulatory purposes are delivered through the relationship that has been in place for four decades between the Laboratory and the Dairy Farmers of Ontario, the Ontario Dairy Council and OMAFRA.

*Other Milk Species*

Verification of tests for the determination of veterinary drug residues in goat milk has been completed, along with a view to add new compounds or tests to this list of verified methods when they are identified in the field or by OMAFRA as priorities. These tests provide both screening and quantitative analysis for use by the industry and OMAFRA for monitoring the safety of these food products.

Concurrently, the AFL is working with its OMAFRA partners to further develop testing for Ontario's growing sheep milk market. For the first time, in 2014/2015, the AFL is testing sheep milk for composition and quality parameters as a routine project in the Dairy Food Safety Program.

**Multi-Residue Methodology**

Dr. Perry Martos continues to apply significant efforts to improve the current method Multiple Residue Methodologies for the Detection and Quantitation of Veterinary Drugs developed specifically for OMAFRA for use in their Meat Inspection Program and Dairy Food Safety Program. Together with the OMAFRA Food Safety Science Unit, they are investigating how to implement changes that optimize the Ministry's testing resources toward fulfilling their mandate for food safety in Ontario within these program areas. In 2013/14, multiple residue methodology was applied to drug residue testing customized to the goat milk industry needs.

**AFL Research Projects**

Five research projects received grant funding at the AFL in 2013/14:

1. Chen, Shu – Principal Investigator, Vanessa Allen - Co-investigator. "Toward Better Understanding and Effective Control of *Listeria monocytogenes* in Ontario's Farm-to-Fork Food Chain by Indexing the Pathogen (Phase II)". OMAFRA-FSRP. Ongoing.

2. Chen, Shu - Principal Investigator, Weido Si- Co-investigator. “Survey of Norovirus Incidence in Fresh Produce and Raw Bovine Milk in Ontario. OMAFRA-FSRP”. Ongoing.
3. Chen, Shu - host and co-supervise Natteewan Udomsil’s Ph.D. thesis research work conducted at AFL, and funded by Thailand Government in collaboration with Dr. Jirawat Yongsawatdigul (Suranaree University of Technology, Thailand). The research is for the development of qPCR methods and analysis of overall microbial population in fish sauce using a next generation sequencing platform. Ongoing.
4. Keith Warriner – Principal Investigator, Carlos Leon-Velarde – Team Member. “Prevalence, Persistence and Control of Non-O157 Shiga Toxin Producing *Escherichia coli*.” OMAFRA-FSRP. Ongoing.
5. Dele Ogunremi – Principal Investigator; Shu Chen – Key team member. “Validation of a highly discriminatory molecular subtyping tool for *Salmonella enteritidis* based on a single nucleotide polymorphism-polymerase chain reaction (SNP-PCR)”. OMAFRA-FSRP. Initiation.

AFL scientists continued to refine and expand expertise with the MLVA subtyping method for *Listeria monocytogenes* under the research projects funded by OMAFRA’s Food Safety Research Program. The MLVA method allows AFL to provide rapid MLVA analysis on suspicious and confirmed *L. monocytogenes* colonies isolated from RTE meat and produce samples, providing strain type information prior to final confirmation, or prior to the isolates reaching a government reference lab, and allowing OMAFRA to take action with increased confidence. OMAFRA has incorporated this method into all testing programs for the current fiscal year 2014/15. This method has also been useful in testing *L. monocytogenes* isolates from the food industry to investigate contamination events (trace back/trace forward). The MLVA method is now being validated among four other government labs (PHO, CFIA, NML and HC) with the intention of future application of the methodology.

AFL has also completed the development and implementation of a simple and cost-effective antibody microarray for detection/identification of the “Top 7” Shiga toxin-producing *Escherichia coli* (STEC) O serogroup organisms using funding from the Ontario Centre of Excellence (OCE). AFL has completed full validation of the microarray combined with an immunoblotting method for detection, isolation and identification of the “Top 7” STEC. The method is currently being used routinely for OMAFRA testing programs.

Progress and final reports for the research projects (listed in the AFL fourth quarter report) have been delivered to the corresponding funding agencies by the Principal Investigators. Additional activities (such as project meetings) in addition to publications and presentations for knowledge translation and transfer (KTT) took place as proposed in the KTT plans for each of the projects.

**Leveraging for Reinvestment and Sustainability**

In 2013/2014, two new UPS units were installed, shifting ownership and long-term management of these power units from CBRE to the AFL. As the AFL building at 95 Stone Road ages, the AFL will be required to continue to cover the on-going capital cost of program-related infrastructure repair or replacement – a cost which is over-and-above that needed to maintain/purchase laboratory equipment and new technology.

It is recognized that the Agreement with OMAFRA is a critical element in the Division's ability to maintain the balance between its capability and capacity for the leveraging of services and remaining a self-sustaining entity within the University of Guelph. Continued success is assured, in part, through ongoing referrals based on the lab's reputation for quality and expertise. In the coming year, the lab is looking to continue to leverage its opportunities for growth in pesticide GLP testing, advanced molecular testing, and continuing with applied research with industry and government partners.

## Animal Health Laboratory (AHL) Program Highlights

The AHL is part of the U of G's Laboratory Services Division. Further information about the division can be found on the University website.

### AHL Infrastructure

Commissioning of the higher containment laboratory (CL2+), room 1822, in the new Pathobiology-Animal Health Laboratory was completed in August 2013. This lab is designed for biocontainment of TSEs (transmissible spongiform encephalopathies) and agents of FADs (foreign animal diseases).

In August/September 2011, Progressive Recovery Inc. (PRI) had installed a 5,000 lb capacity alkaline tissue digester to provide on-site disposal of hazardous animal anatomical waste from the postmortem suite. The digester is functional, and approvals received include: Ministry of the Environment: Environmental Compliance Approval (MOE ECA), City of Guelph approval of condensate discharge. Final documentation has been submitted to CFIA for approval of SRM (specified risk materials) handling. The heating/ventilation/air-conditioning (HVAC) of the digester suite has been upgraded. All relevant operating SOPs are in place.

The pneumatic tube system between building 89 and the OVC Health Sciences Center, installed to expedite delivery of specimens from the HSC to the AHL, was further upgraded with surge protection of computer components, and is fully functional.

Significant new testing equipment was added to the inventory of the AHL through funding from the Animal Health Strategic Investment Program, and additional equipment will be added under the new Disease Surveillance Plan (see 'Operations', below) funding in order to accommodate new testing (fish, bees) and to improve efficiency and surge capacity of the lab.

In order to improve biosecurity and biocontainment at specimen receipt and accessioning, and to improve efficiency of throughput in specimen reception, plans were developed for renovations of the AHL-Guelph Specimen Reception area, which will take place in fall, 2014.

### AHL Operations

The major animal disease event of 2013/14 was the incursion of porcine epidemic diarrhea (PED) into Ontario in January 2014. Based on the emergence of PED in the USA in May 2013, this was anticipated. The AHL had a triplex real-time PCR test (PEDV-TGEV-PCoV) validated and ready for use, and identified the index case in Canada on January 22, 2014. The test was shared with labs across Canada. 63 infected herds were identified in Ontario as

of summer 2014, and including environmental testing, ~13,000 PEDV tests were conducted by the AHL. In March, 2014, porcine deltacoronavirus (PDCoV) was also identified in pigs in Ontario with signs of vomiting and diarrhea. The triplex PCR test was hence updated to replace the generic porcine coronavirus (PCoV) with PDCoV

In addition to the core AHL program of the Agreement, OMAFRA contracted with the AHL to collaboratively develop a new zoonotic Disease Surveillance Plan (DSP) for Ontario. OMAFRA began providing funding of $1.3M per year for five years (2013-2018). Planning for this major initiative began May 1, 2013. The mission of the DSP *is coordinated validation of health with preparedness, early detection, and response to animal disease, through sustainable cross-sector networks*.

Based on input from an initial planning meeting in Sept. 2013 with producers, veterinarians, federal and provincial staff and researchers, work began to organize a series of "expert networks". Members of the networks include OMAFRA, OVC, the AHL, and private practice veterinarians in support of disease surveillance in all of the major animal sectors in Ontario. These expert species networks developed within the DSP constitute the Ontario Animal Health Network (OAHN).

The development of the OAHN and the broader Disease Surveillance Plan is an example of 'knowledge translation and transfer' (KTT) implemented in the Agreement's AHL program.

The AHL continued to offer a wide spectrum of tests, with addition/replacement of improved tests over time as enhanced through the AHSI, e.g., continued replacement of gel-based polymerase chain reaction (PCR) with real-time PCR. Following is a list of new and/or improved tests offered by the AHL in 2013/14.

| TEST NAME METHOD |
|---|
| Hatchery, reactor/excess mortality - *Salmonella* culture |
| Bacterial culture, fecal culture, equine |
| IHC, feline herpesvirus 1 |
| *Mycoplasma hyosynoviae* - PCR |
| *Mycoplasma hyorhinis* - PCR |
| MLST molecular typing |
| *Mycoplasma* isolate preparation for autogenous vaccine |
| Potomac horse fever - PCR |
| Iodine, milk - ICP-MS |
| Rotavirus, porcine Group A/C - PCR |
| Rotavirus, ruminant Group A and B - PCR |
| PEDV-TGEV-PCoV triplex PCR |
| PEDV-TGEV-PDCoV triplex PCR |
| PEDV (Porcine epidemic diarrhea virus) - sequencing |
| PDCoV (Porcine deltacoronavirus) - PCR |
| Bovine respiratory virus panel (IBRV, PI3V, BRSV) - PCR |
| Astrovirus, avian - PCR |

The AHL accessioned 65,345 cases and performed 796,885 procedures in calendar 2013 in support of disease surveillance. Individual procedures are often comprised of multiple tests, e.g., biochemistry profiles of 20 tests each, thus exceeding 1,000,000 tests annually.

The AHL published 22 scientific articles in the quarterly AHL Newsletters in 2013. As well, AHL veterinarians were involved in 27 oral or poster presentations and 35 peer-reviewed publications in calendar year 2013.

The AHL forwarded samples from 91 cases to CFIA laboratories for rule-out of reportable diseases, primarily rabies, but also including classical swine fever, bluetongue, avian influenza, African swine fever, brucellosis, scrapie, anaplasmosis, and other significant foreign animal and zoonotic diseases.

The ISO/IEC 17025 scope of accreditation under the Standards Council of Canada (SCC) was expanded to include “flexible scope” for several of the major test methodologies employed by the AHL, which will enhance our ability to respond more quickly to client needs for new validated tests.

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. Annual updates provided to the Accreditation Committee have been acceptable. The latest AAVLD audit site visit, by a team of 4 assessors, will be held June 15-19, 2014.

The accomplishments of the Animal Health Strategic Investment ($1.5M/y for 5 years) were summarized in the AHSI magazine published in June 2013. The results included > 100 tests developed, $1.3M of equipment purchased, and > 180 publications, presentations and theses produced.

Pathologists in both AHL-Guelph and AHL- Kemptville labs participated in poultry postmortem-based laboratory FAD emergency exercises in October/November 2013.

Further to the enactment of Regulations under the Animal Health Act (AHA) 2009, the AHL, in concert with OMAFRA, developed “case definitions” for the 118 notifiable hazards identified in the Regulations. Based on various triggers – positive results in the range of tests available for each hazard – automatic email alerts are sent from AHL to OMAFRA throughout the day.

OMAFRA is hence kept well informed of laboratory-based identification of hazards, and can access full information on each case cited by the Web Intelligence (WebI) system that queries the AHL data warehouse. This auto-alert system was fully functional on Jan. 1, 2013. The system has reported an average of 95 cases (144 tests) per month to OMAFRA in Jan-April, 2013 (see AHL#2 in Performance Reports section). Cases included a wide range of bacteria and viruses, although the majority (461 of 576 total identifications) were *Salmonella* serotyping.

Several enhancements were made to lab reports over the year to improve client service, e.g., addition of a “Case summary” to pathology reports to better integrate results of testing and interpretation; addition of a “Communications history” at the end of reports to document the timeliness of transmission of results; production of a “Specimen receipt confirmation” report sent to clients as each case is accessioned to confirm tests ordered and turnaround times.

## Research Program Highlights

The Agreement's research program addresses the innovation continuum comprehensively, from funding of market-driven research, to mobilization of research results – into both the public domain and marketplace. Together with research partners along the continuum, the program delivers new knowledge and technologies that support industry competitiveness and public benefits, thereby maximizing the return on public investment.

For 2013/14, the Agreement research program continued under seven areas of priority to OMAFRA: Agricultural Policy & Rural Development*, Bioeconomy – Industrial Uses, Emergency Management, Environmental Sustainability, Food for Health, Product Development & Enhancement through Value Chain Collaboration*, and Production Systems – Plants and Animals (*names revised in 2013/14).

Research project operating funding was restored to all seven themes in the Fall 2013 call for research proposals. See 'Financial Reporting' section for funding details. Funding had been reduced in the Fall 2012 call to $3M while the five year 'midterm' review of the Agreement was being undertaken. Only proposals in three theme areas had been solicited that year.

As a result of pent-up demand in Fall 2013, 193 letters of intent were submitted, one of the highest numbers of proposals received since 2008/09. Following rigorous review, 102 full proposals were approved for funding early in 2014. Eleven of the full proposals addressed more than one research priority area. Examples of proposals funded included:

- Responsible antibiotic use on Ontario dairy farms
- Development of Russian dandelion as a new rubber-producing crop for Ontario
- Novel strategies for the replacement of trans and saturated fats in finished food
- Fate of invasive and herbicide resistant weed seeds after anaerobic digestion
- Identifying pigs with disease resistance that can be fed low quality protein diets without compromising health and performance
- Implications of private water supply and waste water systems for rural Ontario municipalities
- Substituting carbon black through agro-derived bio-black for 'green' automotive products

More examples of research projects underway in each theme area can be found in the 2014 Agri-Food Yearbook, published annually and posted on the U of G website.

Demonstrating the research program's agility in responding to unplanned urgencies, a project related to the Porcine Epidemic Diarrhea Virus (PEDV) outbreak of Jan. 2014 was funded in April 2014 (outside of the research funding cycle), under the Emergency Management research theme. The project is documenting the circumstances surrounding the emergence of PEDV in Ontario swine during the early phase of the outbreak.

OMAFRA investment in the Agreement's research program continued to leverage external third party funding. For 2013/14, the ratio of leveraged research operating funds To OMAFRA funding was 2.1:1. Specifically, $11.2 million of third party (non-Ontario government funds) was leveraged by OMAFRA's $5.4 million of research operating funding. This is one of the research program's performance indicators.

The Agricultural Research Institute of Ontario's (ARIO) ten year research infrastructure strategy continued to be implemented through 2013/14. The strategy is foundational to the Agreement research program and its ability to deliver OMAFRA research priorities. Two of the strategy's key research infrastructure projects – the Vineland Research and Innovation Centre (VRIC), and the Livestock Research and Innovation Corporation (LRIC) dairy phase at Elora - made significant progress in 2013/14 in planning and construction respectively. Both are funded jointly through OMAFRA, U of G, and industry.

VRIC's focus on business collaborations resulted in more than 45 new licensing and research agreements signed with producers, processors and food companies in 2013/14. LRIC began construction on a state- of-the-art dairy research facility, designed in collaboration with Ontario's dairy industry. It will be completed in summer 2015.

**Knowledge Translation and Transfer (KTT) Program Highlights***

To fully realize the benefits of research, the results must be translated into meaningful application and transferred to potential adopters. The current Agreement focuses on this next step on the innovation continuum.

Many excellent on-line tools were built in the first five years of the Agreement (website, twitter feed, newsfeed etc.) to reach target groups according to their specific information needs. Funding to the program was reduced for the second five years, beginning in 2013/14, because these tools now require only updating and maintenance.

The annual calls for KTT proposals in all seven research theme areas continued; there were 64 completed projects and 4 active ones by the end of 2013/14. Examples of projects selected for funding in 2013/14 included: use of smartphone apps for implementation of dairy health research results, and distance support for on-farm investigation of small ruminant mortalities. A complete list of KTT research projects is available on-line.

*Agri-Food and Rural Link* (the branding name for the KTT program), and OMAFRA KTT staff sponsored many research / industry / public events in 2013/14 including:

- 2013 Canadian Knowledge Mobilization Forum
- Bioeconomy seminar
- Canadian Outdoor Farm Show
- Food and Healthcare: Does local fit?
- Bioeconomy Research Day
- Emergency Management Research Expo
- Food for Health plain language poster display, and one-minute research pitches by students at the Royal Winter Fair
- Rural Policy Knowledge Day
- Knowledge Exchange Day – highlighting new and effective KTT techniques
- KTT Community of Practice monthly meetings of KTT professionals
- 'News@Noon' speaker series – 3 researcher presentations
- 'The Buzz' on-line news about Agreement-funded projects – 2 new issues
- 'Students Promoting Awareness of Research Knowledge' (SPARK) articles written for Ontario farm media, U of G Research magazine and website – 58 articles published

- ‘SPARK Air’ videos – 5 videos on new research posted on the university’s YouTube pages.
- 2014 Yearbook – reader friendly annual highlights from all program areas of the Agreement cost-effectively distributed to 34,000+ readers of the ‘Ontario Farmer’ weekly paper

A strategic planning review of the KTT program was conducted in summer 2013 via an electronic questionnaire distributed extensively within the U of G and OMAFRA, and to external stakeholders. Two facilitated sessions were held with internal staff as well as two ‘World Café’ sessions with both internal and external stakeholders

The exercise was helpful in identifying elements of the KTT program that were working well and potential improvements moving forward. A KTT ‘casebook’ was also compiled, providing summaries of funded KTT projects, and lessons learned in the first five years of the program. Details of the strategic review and casebook are available from U of G KTT staff.

**Research Commercialization***

An important component of the innovation continuum is the protection of intellectual property. Whereas the KTT program mobilizes information into the public domain, the University’s Catalyst Centre (CC) helps researchers identify research results more appropriately managed with proprietary expertise. The Centre also connects researchers and industry contacts, leveraging collaborations and funding opportunities.

The Director of the CC and the OMAFRA Research Program Co-Chair are the voting members of the Agreement’s ‘Joint Intellectual Property Management Committee’, through which decisions are shared on the various technologies being reviewed &/or managed by the CC.

In 2013/14, the CC reported 167 disclosures of intellectual property, 17 patents filed, 49 licenses granted and 3 patents issued related to OMAFRA funded technologies. Total license revenue for OMAFRA-supported research reached $1,339,664. Appendix A-2 details these numbers and percentages of OMAFRA-funded technology results.

Germplasm royalty revenues increased by 4% over the previous fiscal year, surpassing $0.9M This was primarily due to increased revenue derived from tofu-type soybean varieties from the Guelph and Ridgetown soybean breeding programs and gains in sales of tomatoes, apple rootstock, strawberries. Appendix A-3 lists the most significant royalty bearing germplasm varieties for the same period.

Returns to the germplasm portfolio accounted for 42% of the total royalty revenues returned to the CC in 2013/14. Total returns generated from plant technologies since the inception of the technology transfer program in 1977 reached over $12.2 million in royalties. These royalties are re-invested back into U of G crop research. The wider economic impact of these discoveries is striking with an economic impact estimated to be totaling >$8.75 billion dollars of seed, crop and market sales.

As a result of budget realignments with OMAFRA research priorities, the Agreement provided $0.25M to the CC beginning in 2013/14 in support of industry liaison and germplasm technology transfer positions, and additional industry networking efforts. In that

year, the new Industry Liaison position helped to create 24 new academic-industry research partnerships.

Also new in 2013/14 was the 'Gryphons LAAIR' (*Leading to Accelerated Adoption of Innovative Research*), a $0.4M research commercialization fund to accelerate the adoption of agri-food products and services originating from innovative U of G research. In its first year, 28 researchers put forward proposals; eight were funded. CC staff were part of the selection team. Examples of successful proposals included: collaborative work with a private sector nursery to transfer accelerated apple root stock cultivation technology, and an assessment of the starch industry's capacity for adoption of novel enzyme technology.

OMAFRA's Proof-of-Principle (POP) Fund operates outside of the Agreement, however it is directed toward University inventions that support OMAFRA's research objectives, most of which have been developed through Agreement funding. The CC has responsibility to distribute funds to the most promising projects. In 2013/14 three new projects received funding, resulting in patent filings for all three technologies and one option agreement. This program has supported commercial development of nine such technologies to date, resulting in patent filings on four technologies, one issued patent, one license deal, one option deal and several potential licenses that are currently being negotiated. See Appendix A-4 for details.

**Highly Qualified Personnel (HQP) Program Highlights***

Skilled workers are essential at all points along the innovation spectrum, in the same way they are needed along a successful value chain. The Agreement's HQP Graduate Program provides scholarships to masters and doctoral students at the U of G to enhance their 'market readiness' and intellectual capital for the sector. It does this by offering experiential learning opportunities beyond those normally available to graduate students undertaking agri-food research.

Students complete a mandatory business course focused on Ontario's agri-food industry and participate in at least one semester of job shadowing/work experience. Over the last six years, 56 students have selected private companies, 13 have chosen OMAFRA, while the others took work placements with local, provincial or federal government agencies.

The HQP program has been considered highly successful both by graduates and employers, but because of budget realignments, only one competition for applicants was held in 2013/14. In that year, 7 MSc students and 6 PhD students were awarded HQP scholarships. Since 2008-09, has program has graduated 56 MSc, 43 PhD and one DVSc.

*** Note:** Although most of the KTT, commercialization and HQP initiatives occurred within the Agreement's Research Program, the Animal Health Lab, Agriculture and Food Lab and Veterinary Clinical Education programs also included KTT and HQP components. See the financial tables of this report where they are listed under 'Growing Forward 2 (Fund 112)'. GF2 is a federal-provincial-municipal initiative.

## Veterinary Clinical Education Program (VCEP) Highlights

VCEP continued to provide core funding for the operation of the Ontario Veterinary College's Health Sciences Centre, advanced clinical training, an externship for DVM students and a one year veterinary internship through the OVC.

OVC continued its full accreditation from the AVMA and CVMA (the American and Canadian veterinary medical associations). The associations' Council on Education annually reviews the annual updates provided by OVC, describing its progress towards objectives established at the full review conducted in 2009. The next site visit and full review will occur in Oct. 2015.

As a result of OVC's continued accreditation by the AVMA and CVMA, veterinary students are eligible to write the North American Veterinary Licensing examination. In 2013/14, they continued to perform at a very high level on the examination, resulting in excellent hiring rates and strong employer satisfaction with new graduates.

The final year Rural Community Practice and Food Animal streams of the DVM Program curricular enhancement were approved by the DVM Program Committee, for implementation in the fall of 2014. These changes will help ensure that graduates are prepared to meet the needs and expectations of their employers, clients and the food animal industries that they will serve.

The Bovine Education Trust continued to provide financial support to food animal oriented veterinary students to obtain further hands-on clinical practice experience in the dairy and beef industries and final year elective rotations in bovine clinical skills and equine primary care. In 2013/14, seven students were assisted.

The Centre for Public Health and Zoonoses (CPHAZ) at U of G, funded in part by the OMAFRA-U of G Agreement, hosted the 2013 annual international meeting of *Rabies in the Americas.* RITA is the longest running and largest conference specific to rabies in the world. The meeting involved about 250 participants, over a dozen exhibitors, and close to 60 presentations and 60 posters. A special 2014 issue of the journal *Zoonoses and Public Health* highlighted the work of the CPHAZ Director, Dr. Jan Sargeant, in applying evidence-based practice and systematic reviews to animal health and zoonotic disease. The Agreement's support to CPHAZ is an example of knowledge translation and transfer (KTT) at work in a veterinary context.

The Masters in Public Health (MPH) is also funded in part by the OMAFRA-U of G Agreement. In Sept. 2013, MPH enrolled its sixth class, with over 258 applicants having applied to the 20 available positions. Application numbers to the program have increased every year since its inception in 2009. As of 2013/14, a total of 87 graduates have gone on to find work in a wide range of public and private sector positions.

Five internships in the OVC Health Sciences Centre were funded, as were 15 Doctor of Veterinary Science students who conduct research in areas of priority for OMAFRA.

Some examples of their post-graduate research projects include:

- Peri-parturient management of hypocalcemia in dairy cows and its impact on health, performance and immune function.

- Role of European starlings (*Sturnus vulgaris*) in the epidemiology of zoonotic and antimicrobial resistant pathogens in dairy farms.

- Epidemiology of swine influenza on Canadian swine farms

- Immune system response to Bovine Respiratory Disease in cattle

- Indicators of early response to mycobacterium *Avium paratuberculosis* (MAP) infection in bovine blood

- Indicators of early response to mycobacterium *Avium paratuberculosis* (MAP) infection in bovine gut

These research projects support OMAFRA's research priority in animal production systems.

Both the MPH and internships are an example of HQP at work in a veterinary and public health context.

# OMAFRA - U OF G PARTNERSHIP AGREEMENT FINANCIAL REPORT

The financial reporting included in this Annual Report 2013/14 for the OMAFRA-U of G Partnership consists of two sections, as follows:

1. The "Audited Statement of Revenues and Expenses for the fiscal year May 1, 2013 to April 30, 2014", as submitted to OMAFRA on September 29, 2014 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 2013/14 (May 1, 2013 to April 30, 2014) for each of the four programs (Research, VCEP, AFL and AHL) as well as for the Agriculture Research Institute of Ontario (ARIO) Minor Capital Fund (see note *) funded, as applicable, through:
   - the Base 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. Note: remaining funds shown for 2013/14 are carry forwards),
   - the Growing Forward 2 fund,
   - the Total Partnership (Agreement + New Initiatives + Growing Forward 2).

   "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 (PS) 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 - U of G 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, 2013 - April 30, 2014). |
| OMAFRA – Other | Theses 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 within the University, 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 2013/14 Actuals - Revenue & Expenses of Entire Agreement by Program (*in thousands of dollars*)

### Base Agreement (Fund 110): All Programs

| | Object Category | Research | Vet Clinical Education | Agri-Food Lab | Animal Health Lab | ARIO Minor Capital | Total Agreement |
|---|---|---|---|---|---|---|---|
| Revenue | OMAFRA Agreement | (41,147) | (5,182) | (5,872) | (6,595) | - | (58,795) |
| | OMAFRA Other | (25) | - | (250) | (250) | (3,662) | (4,187) |
| | Sales Goods & Services | (4,942) | - | (8,127) | (4,560) | - | (17,629) |
| | Other Revenue & Interest | (1,757) | - | (20) | (3) | 12 | (1,792) |
| | Total Revenue | (47,871) | (5,182) | (14,269) | (11,408) | (3,674) | (82,404) |
| Expenses | Personnel | 18,774 | 5 | 9,831 | 8,362 | 16 | 36,988 |
| | Faculty Pool Costs | 8,900 | 1,900 | - | - | - | 10,800 |
| | Operating | 14,258 | 3,156 | 4,562 | 4,236 | 3,658 | 29,870 |
| | Internal Sales & Recoveries | (3,891) | 1 | (411) | (1,453) | - | (5,754) |
| | Indirect Costs | 9,830 | 120 | 287 | 263 | - | 10,500 |
| | Total Expense | 47,871 | 5.182 | 14,269 | 11,408 | 3,674 | 82,404 |
| | Net Expense (Revenue) | - | - | - | | - | - |

### New Initiatives (Fund 111): All Programs

| | Object Category | Total Research | Vet Clinical Education | Agri-Food Lab | Animal Health Lab | ARIO Minor Capital | Total New Initiatives |
|---|---|---|---|---|---|---|---|
| Revenue | OMAFRA Agreement | (4,655) | (496) | - | (185) | - | (5,337) |
| | OMAFRA Other | (10) | - | - | - | - | (10) |
| | Sales Goods & Services | - | - | - | - | - | - |
| | Other Revenue & Interest | (3) | - | - | - | - | (3) |
| | Total Revenue | (4,668) | (496) | - | (185) | - | (5,350) |
| Expenses | Personnel | 4,482 | 163 | - | 29 | - | 4,674 |
| | Faculty Pool Costs | - | - | - | - | - | - |
| | Operating | 224 | 363 | - | 156 | - | 743 |
| | Internal Sales & Recoveries | (38) | (30) | - | - | - | (68) |
| | Indirect Costs | - | - | - | - | - | |
| | Total Expense | 4,668 | 496 | - | 185 | - | 5,350 |
| | Net Expense (Revenue) | - | - | - | - | - | - |

## Growing Forward 2 – Additional Base (Fund 112): All Programs

| | Object Category | Total Research | Vet Clinical Education | Agri-Food Lab | Animal Health Lab | ARIO Minor Capital | Total New Initiatives |
|---|---|---|---|---|---|---|---|
| Revenue | OMAFRA Agreement | (317) | (351) | - | (413) | - | (1,081) |
| | OMAFRA Other | - | - | - | - | - | - |
| | Sales Goods & Services | - | - | - | - | - | - |
| | Other Revenue & Interest | - | - | - | - | - | - |
| | Total Revenue | (317) | (351) | - | (413) | - | (1,081) |
| Expenses | Personnel | 172 | 173 | - | 44 | - | 389 |
| | Faculty Pool Costs | - | - | - | - | - | - |
| | Operating | 145 | 196 | - | 369 | - | 710 |
| | Internal Sales & Recoveries | - | (18) | - | - | - | (18) |
| | Indirect Costs | - | - | - | - | - | - |
| | Total Expense | 317 | 351 | - | 413 | - | 1,081 |
| | Net Expense (Revenue) | - | - | - | - | - | - |

## Total Partnership (Renewed Agreement, New Initiatives & Growing Forward 2): All Programs

| | Object Category | Total Research [1] | Vet Clinical Education | Agri-Food Lab | Animal Health Lab | ARIO Minor Capital | Total Partnership |
|---|---|---|---|---|---|---|---|
| Revenue | OMAFRA Agreement | (46,119) | (6,029) | (5,872) | (7,193) | - | (65,213) |
| | OMAFRA Other | (35) | - | (250) | (250) | (3,662) | (4,197) |
| | Sales Goods & Services | (4,942) | - | (8,127) | (4,560) | - | (17,629) |
| | Other Revenue & Interest | (1,760) | - | (20) | (3) | (12) | (1,795) |
| | Total Revenue | (52,856) | (6,029) | (14,269) | (12,006) | (3,674) | (88,834) |
| Expenses | Personnel | 23,428 | 341 | 9,831 | 8,435 | 16 | 42,051 |
| | Faculty Pool Costs | 8,900 | 1,900 | - | - | - | 10,800 |
| | Operating | 14,627 | 3,715 | 4,562 | 4,761 | 3,658 | 31,322 |
| | Internal Sales & Recoveries | (3,929) | (47) | (411) | (1,453) | - | (5,839) |
| | Indirect Costs | 9,830 | 120 | 287 | 263 | - | 10,500 |
| | Total Expense | 52,856 | 6,029 | 14,269 | 12,006 | 3,674 | 88,834 |
| | Net Expense (Revenue) | - | - | - | - | - | - |

Note 1: See the following pages for the breakout of Research Program finances by priority / theme area.

## Summary 2013/14 Actuals – Revenue and Expenses by Research Sub- Program or Theme (*in thousands of dollars*)

### Base 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 | Comm | Research |
| Revenue | OMAFRA Agreement | (15,519) | (421) | (3,218) | (1,592) | (1,820) | (1,960) | (1,672) | (8,140) | (6,805) | - | - | - | (41,147) |
| | OMAFRA Other | (5) | - | - | - | - | - | - | (19) | (1) | - | - | - | (25) |
| | Sales Goods & Services | (360) | - | - | - | - | - | - | (4,423) | (159) | - | - | - | (4,942) |
| | Other Revenue & Interest | (298) | (1) | (48) | (9) | (21) | (25) | (35) | (552) | (768) | - | - | - | (1,757) |
| | Total Revenue | (16,182) | (422) | (3,266) | (1,601) | (1,841) | (1,985) | (1,707) | (13,134) | (7,733) | - | - | - | (47,871) |
| Expense | Personnel | 6,437 | 12 | 299 | 185 | 19 | 82 | 120 | 8,667 | 2953 | - | - | - | 18,774 |
| | Faculty Pool Costs | 4,349 | 393 | 950 | 1,171 | 850 | 788 | 409 | - | - | - | - | - | 8,900 |
| | Operating | 1,153 | 1 | 735 | 1 | 426 | 457 | 463 | 5,216 | 5,806 | - | - | - | 14,258 |
| | Internal Sales & Recoveries | (969) | - | - | - | - | - | - | (1,629) | (1,293) | - | - | - | (3,891) |
| | Indirect Costs | 5,212 | 16 | 1,282 | 244 | 546 | 668 | 715 | 880 | 267 | - | - | - | 9,830 |
| | Total Expense | 16,182 | 422 | 3,266 | 1,601 | 1,841 | 1,985 | 1,707 | 13,134 | 7,733 | - | - | - | 47,871 |
| | Net Expense (Revenue) | - | - | - | - | - | - | - | - | - | - | - | - | - |

### 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 | Comm | Research |
| Revenue | OMAFRA Agreement | (991) | (660) | (90) | (641) | (324) | (400) | (337) | - | - | (616) | (596) | - | (5,337) |
| | OMAFRA Other | (5) | - | - | - | (2) | - | (3) | - | - | - | - | - | (10) |
| | Sales Goods & Services | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Other Revenue & Interest | - | - | | - | (1) | - | - | - | - | - | (2) | - | (3) |
| | Total Revenue | (996) | (660) | (90) | (641) | (327) | (400) | (340) | - | - | (616) | (598) | - | (5,350) |
| Expense | Personnel | 907 | 501 | 445 | 459 | 452 | 720 | 574 | - | - | 20 | 404 | - | 4,674 |
| | Faculty Pool Costs | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Operating | 103 | 155 | (335) | 186 | (125) | (320) | (232) | - | - | 596 | 196 | - | 743 |
| | Internal Sales & Recoveries | (14) | 4 | (20) | (4) | - | - | (2) | - | - | - | (2) | - | (68) |
| | Indirect Costs | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Total Expense | 996 | 660 | 90 | 641 | 327 | 400 | 340 | - | - | 616 | 598 | - | 5,350 |
| | Net Expense (Revenue) | - | - | - | - | - | - | - | - | - | - | | - | - |

## Continued: Summary 2013/14 Actuals Revenue and Expenses by Research Sub-Program or Theme(*in thousands of dollars*)

### Growing Forward 2: 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 | Comm | Research |
| Revenue | OMAFRA Agreement | - | - | - | - | - | - | - | - | - | (94) | (39) | (184) | (317) |
| | OMAFRA Other | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Sales Goods & Services | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Other Revenue & Interest | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Total Revenue | - | - | - | - | - | - | - | - | - | (94) | (39) | (184) | (317) |
| Expense | Personnel | - | - | - | - | - | - | - | - | - | - | 28 | 144 | 172 |
| | Faculty Pool Costs | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Operating | - | - | - | - | - | - | - | - | - | 94 | 11 | 40 | 145 |
| | Internal Sales & Recoveries | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Indirect Costs | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Total Expense | - | - | - | - | - | - | - | - | - | 94 | 39 | 184 | 317 |
| | Net Expense (Revenue) | - | - | - | - | - | - | - | - | - | | - | - | - |

## Continued: Summary 2013/14 Actuals Revenue and Expenses by Research Sub-Program or Theme (*in thousands of dollars*)

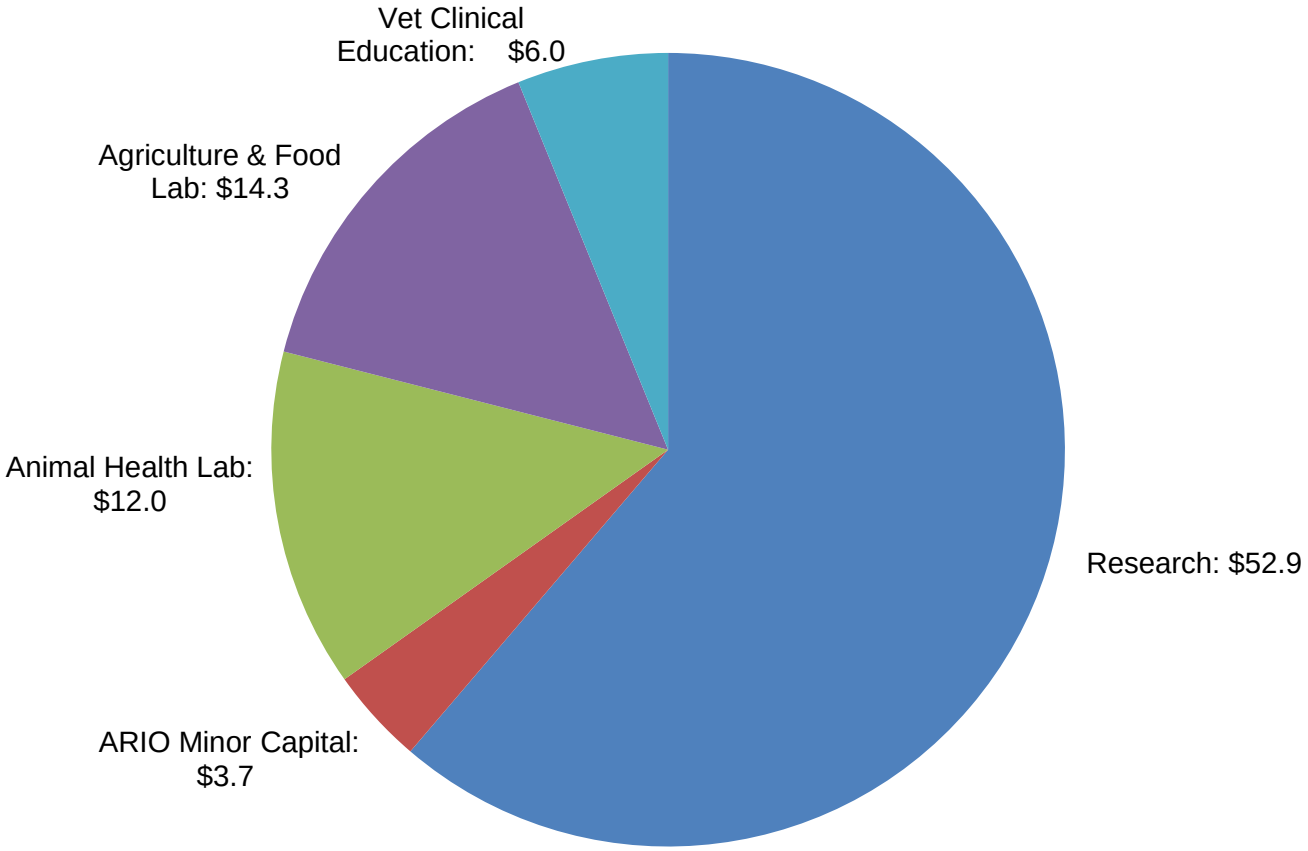
### Total Partnership (Base Agreement, New Initiatives & Growing Forward 2): Research

| | | 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 | Comm | Research |
| Revenue | OMAFRA Agreement | (16,510) | (1,081) | (3,308) | (2,233) | (2,144) | (2,360) | (2,009) | (8,140) | (6,805) | (710) | (635) | (184) | (46,119) |
| | OMAFRA Other | (10) | - | - | - | (2) | - | (3) | (19) | (1) | - | - | - | (35) |
| | Sales Goods & Services | (360) | - | - | - | - | - | - | (4,432) | (159) | - | - | - | (4,942) |
| | Other Revenue & Interest | (298) | (1) | (48) | (9) | (22) | (25) | (35) | (552) | (768) | - | (2) | - | (1,760) |
| | Total Revenue | (17,178) | (1,802) | (3,356) | (2,242) | (2,168) | (2,385) | (2,047) | (13,134) | (7,733) | (710) | (637) | (184) | (52,856) |
| Expenses | Personnel | 7,344 | 513 | 744 | 644 | 471 | 802 | 694 | 8,667 | 2953 | 20 | 432 | 144 | 23,428 |
| | Faculty Pool Costs | 4,349 | 393 | 950 | 1,171 | 850 | 778 | 409 | - | - | - | - | - | 8,900 |
| | Operating | 1,256 | 156 | 400 | 187 | 301 | 137 | 231 | 5,216 | 5,806 | 690 | 207 | 40 | 14,627 |
| | Internal Sales & Recoveries | (983) | 4 | (20) | (4) | - | - | (2) | (1,629) | (1,293) | - | (2) | - | (3,929) |
| | Indirect Costs | 5,212 | 16 | 1,282 | 244 | 546 | 668 | 715 | 880 | 267 | - | - | - | 9,830 |
| | Total Expense | 17,178 | 1,802 | 3,356 | 2,242 | 2,168 | 2,385 | 2,047 | 13,134 | 7,733 | 710 | 637 | 184 | 52,856 |
| | Net Expense (Revenue) | - | - | - | - | - | - | - | - | - | - | - | - | - |

## Summary 2013/14 Actuals - Fully Allocated Research Program Expenses by Research Sub- Program or Theme (*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 | Comm | Research |
| Total Theme Expenses as above: | 17,178 | 1,082 | 3,356 | 2,242 | 2,168 | 2,385 | 2,047 | 13,134 | 7,733 | 710 | 637 | 184 | 52,856 |
| Allocation of ARIO Research Station Costs | 14,191 | 24 | 1,892 | 1,893 | 814 | 986 | 1,067 | (13,134) | (7,733) | - | - | - | - |
| Fully Allocated Theme Expenses | 31,369 | 1,106 | 5,248 | 4,135 | 2,982 | 3,371 | 3,114 | - | - | 710 | 637 | 184 | 52,856 |

## Summary 2013/14 Actuals – Revenue and Expenses of Entire Agreement by Program ($millions)



# PROGRAM PERFORMANCE REPORTS

## Overall Agreement

Performance Indicators

Data collection 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 'Overall '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 of Guelph as a world leader in agri-food, veterinary and associated sciences. | |
| | Metric (a) | Overall University ranking. Same as metric R3 (b). |
| | Baseline: | Ranking as per 2008 results. U of G ranked 2nd in the 'comprehensive' university category. |
| | Target: | Maintenance or improvement of university standing **(2nd)** according to the Research Money Inc. ranking of Canadian universities. |
| | Results (2013/14): | The most current (2013) Research Money Inc. report of Canadian universities' standings ranks U of G **2nd** 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.<br>Research: **171.9**<br>VCEP**:** **45.9**<br>AFL: **53.0**<br>AHL: **71.0** |
| | Target: | 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 (2013/14): | Number of faculty, scientific and technical FTEs supported or leveraged by the Partnership research projects:<br>Research**:** **342.25**<br>VCEP: **45.9**<br>AFL: **89.2**<br>AHL: **81.9** |
| | | (Additional information: Number of faculty FTEs engaged in projects supportive of OMAFRA priorities, but not allocated to approved OMAFRA Partnership projects is estimated at 222 'Research' FTEs. When these 'Research FTEs' are 'converted' to full faculty FTEs, this represents 110 full faculty FTEs devoted to research related to theme priorities). |
| | | |
| | 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 such as international panels, and leadership of national and international research initiatives etc.. Same as metric R3 (a). |
| | Baseline: | 2008/09 results are the baseline. **25** faculty members were Canada Research Chairs, of which 10 had active Partnership Agreement research projects. |
| | Target: | Number of faculty/researchers/staff recognized by their peers, and significance of awards, appointments etc. to be **≥** baseline. |
| | Results (2013/14): | During 2013/14, **29** faculty members at the U of G were Canada Research Chair holders, of which 10 had active OMAF/MRA 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 |
| | Baseline: | For 2008/09, total dollars invested from third-party sources were reported below as:<br>• Research (operating): **$9.2** million (excluding all Provincial government funding). This is funding secured for research projects from third-party sources.<br>• AHL: **$3.6** million<br>• AFL: **$9.8** million<br>• VCEP: no revenue generation |
| | Target: | Total dollars invested/generated from third-party sources **≥** 2008/09 baselines. |
| | Results (2013/14): | Research (operating): **$11.1 million**<br>AHL: **$4.6 million**<br>AFL: **$8.1 million**<br>VCEP: no revenue generation |
| | Metric (b) | Total non-OMAFRA program revenue |
| | Baseline: | 2008/09, total non-OMAF/MRA program revenue<br>Research**: $6.4 million**<br>AHL: **$3.7 million**<br>AFL: **$9.5** million, **$0.3 million** from OMAF/MRA, not related to Partnership Agreement<br>VCEP: no revenue generation |
| | Target: | Total non-OMAF/MRA revenue **≥** 2008/09 baselines. |
| | Results (2013/14): | Research: **$4.9 million**<br>AHL: **$4.6 million**<br>AFL: **$8.1 million** |

| | | |
|---|---|---|
| | | VCEP: no revenue generation<br>This category records revenues for testing services provided to external clients by the Lab Services division (AFL and AHL), 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 - U of G staff engagement/satisfaction with overall Partnership |
| | Baseline: | Joint staff engagement survey distributed to all OMAF/MRA and U of G personnel involved with the partnership. |
| | Target: | Maintenance or improvement of 2008/09 survey results. |
| | Results (2013/14): | This PI was addressed in a 2012/13 study undertaken as part of the five year review of the Partnership Agreement, (Stoddard, 2012). It indicated positive levels of staff engagement / satisfaction with the overall Agreement.<br>The findings are detailed in OA3 of the 2012/13 Annual Report.<br><br>In 2013/14, OMAFRA and U of G staff continued to work closely and collaboratively as co-chairs for the four program areas of the Agreement, and co-leads for each of the seven research areas. |
| | | |
| 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 five year evaluation of the Partnership, to be conducted by an external third party. |
| | Baseline: | PIs OA4, 5 and 6 will be achieved through a 2012 midterm study similar to the Deloitte report of |

| | | |
|---|---|---|
| | | 2007 (U of G / OMAFRA Impact Study). |
| | Target: | Evaluation plan for year five to be undertaken and approved in 2009/10, describing content and format of 2012/13 report. Report was completed in 2012. |
| | Results (2013/14): | This PI was addressed in a 2012/13 study undertaken as part of the five year review of the Partnership Agreement (Price Waterhouse Coopers, Dec. 2012).<br>The findings are detailed in OA4 of the 2012/13 Annual Report.<br><br>Many examples of revenue-generating solutions, products and services developed through the Agreement can be accessed in the Agri-Food Yearbook posted annually on the U of G website.<br>Further information concerning revenues is also described in Research PI #1b: third party investment in research operating funding and PI #8b and c: number of licenses and patents applied for. |
| | | |
| 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 though 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 2012 midterm study similar to the Deloitte report of 2007 (U of G / OMAFRA Impact Study). |
| | Target: | Evaluation plan for year five to be undertaken and approved in 2009/10, describing content and format of 2012-13 report. Report was completed in 2012. |
| | Results (2013/14): | This PI was addressed in a 2012/13 study undertaken as part of the five year review of the Partnership Agreement (Price Waterhouse Coopers, Dec 2012).<br>The findings are detailed in OA5 of the 2012/13 Annual Report.<br><br>Current examples of economic and health benefits developed through the Agreement are shown in the Agri-Food Yearbook posted annually on the U of G website. |
| | | |

| 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 - U of G 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 2012 midterm study similar to the Deloitte report of 2007 (U of G / OMAFRA Impact Study). |
| | Target: | Evaluation plan for year five to be undertaken and approved in 2009/10, describing content and format of 2012/13 report. Report was completed in 2012. |
| | Results (2013/14): | This PI was addressed in a 2012/13 study undertaken as part of the mid-term review of the Partnership Agreement (Stoddard, Sept 2012).<br>The study findings were very positive and are detailed in OA6 of the 2012/13 Annual Report.<br><br>In 2013/14, external stakeholder satisfaction continues to drive the research priority setting, funding and mobilization of research results so that maximum benefits accrue to the Ontario public. |

# 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 wellbeing of the province and its citizens.

AGRICULTURE AND FOOD LABORATORY

- DNA fingerprinting methodology (MLVA) expanded across OMAFRA programs; nearly 4000 isolates characterized for database that facilitates tracking contamination sources of *Listeria monocytogenes*
- Successful 4th of five-year contract for milk composition with DFO (>800,000 samples)
- Refining and expansion of methodology for the testing of drug and pesticide residues introduced financial savings and value-added information and additional species testing for OMAFRA
- Neonicotinoid residues were incorporated into the Foods of Plan Origin and and Horticultural Technology testing programs at OMAFRA.

- AFL's Pest Diagnostic Clinic celebrated its 35th anniversary in 2013.
- The Canadian Veterinary Urolith Centre reached an important milestone in the analysis of its 100,000th stone
- Successful fourth year of CFIA chemical residue testing further aligning OMAFRA's efforts nationally

- Successful achievement of established benchmarks across all 7 performance indicators (98% compliance or greater where required)
- Accreditation to ISO/IEC 17025 standard & individual test accreditations by recognized bodies (e.g. SCC, CALA)

- Five successful collaborative research proposals
- Nineteen KTT events (presentations and posters)
- Nine peer-reviewed journal publications
- Contribution to 9 graduate students' programs

## Agriculture and Food Laboratory

Performance Indicators

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

| Key Outcome | Highly qualified & skilled lab personnel & equipment supported by required accreditation.<br>Improved lab and food safety technology & 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 the ISO/IEC 17025 standard.<br>• Individual test method accreditation by recognized bodies e.g. Standards Council of Canada (SCC), Canadian Association for Laboratory Accreditation (CALA).<br>• Maintenance of proficiency for individual test methods per program availability. |
| | Target: | Maintenance of accreditation |
| | Results (2013/14): | • LSD, including AFL, is accredited by both of Canada's internationally recognized accrediting bodies, Standards Council of Canada (SCC) and the Canadian Association for Laboratory Accreditation (CALA) to the ISO/IEC 17025 standard.<br>In 2013/14, under Schedule "F", LSD/AFL provided testing services for 3 programs within the Food Inspection Branch. The AFL is accredited to the ISO/IEC 17025 quality standard for specific tests listed in scope.<br>• In addition, LSD/AFL performs 32 tests for Horticulture and Agriculture Land Use program and Environmental Management program, accredited methods in this program may be accredited by SCC, CALA or OMAFRA soil fertility program.<br><u>Standards Council of Canada</u> |

| | | |
|---|---|---|
| | | LS 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). As of May 29, 2014, LS has 125 tests listed on the scope, 104 AFL tests and 21 AHL tests.<br>In the 2012/13 fiscal year, LSD/AFL reviewed its scope of accreditation and testing activities and significantly revised our SCC scope of accreditation. In total, 8 tests were added (7 AFL tests) and withdrew accreditation from 43 inactive tests.<br>On April 16, 2013, LS submitted a scope extension application to SCC to add 8 tests, including 5 AFL tests. The application is under review by the SCC technical assessors.<br><br>(Please refer to posted scope of accreditation for laboratory number 100 on the SCC website for full details.)<br><br><u>Canadian Association for Laboratory Accreditation</u><br>Lab Services is accredited by CALA for 14 environmental tests. 11 AFL tests and 3 AHL tests. The CALA accredited tests include 4 AFL microbiology test licensed under the Ontario Safe Drinking Water Act.<br>The accrediting bodies require a biennial assessment of the quality management system and tests listed on the scope of accreditation. On November 19, 2013, LS/AFL submitted the required responses to the SCC biennial assessment. On February 14, 2104, the SCC approved all corrective actions from the October 2013 biennial assessment. On May 29, 2014 the revised scope of testing was posted on the SCC website.<br>Note that some methods are used to analyze multiple parameters e.g., CHEM-041 MRD is used to analyze samples for amphenicols, beta-lactams, sulfonamides, and tetracyclines.<br><br><u>Proficiency Testing</u><br>In support of OMAFRA Schedule F testing in 2013/2014, the AFL analyzed and reported over 430 PT results. |
| Key Outcome | Scientific & statistical integrity of routine analytical test data to ensure quality, reliable results. | |
| Performance Indicator<br>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:<br>• Turnaround times for screenings and confirmation<br>• Corrected reports<br>• Non-conforming samples |
| | Baseline: | 98% compliance met. |
| | Target: | Maintain **98%** compliance with service level standard |
| | Results (2013/14): | The Agriculture and Food Laboratory has met or exceeded the requirement:<br>• Turnaround time for test results was met **99.5%** of the time over the full fiscal year 2013/14.<br>• Correct reports – 98% compliance met **(99.7%)**<br>• Non-conforming samples – 98% compliance met **(99.8 %)** |
| | | |
| Key Outcome | Strong linkages built to ensure effective, timely 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 [2011] or CAPA [2012]) and report all non-conformances, resolution and continuous improvement initiatives. | |
| | Metric | a) LabTrack (2011) or CAPA (2012) reporting of all non-conformances |
| | Baseline: | Service level standard is to continually improve through the process of documenting an reviewing incident report (LabTrack or CAPA) and associated follow-up and resolution initiatives |
| | Target: | To manage the incidents every year with demonstration of continuous improvements. |
| | Results (2013/14): | AFL understands that the focus of this performance measure is to demonstrate the AFL's ability to address those results *required for OMAFRA actionable response*.<br><br>A significant decrease in medium to high risk incident reports occurred in 2013/14. A total of 24 incident reports (versus 63 in 2012/13) were identified during the processing/testing/reporting of 69,523 tests reported for OMAFRA Schedule "F" samples, excluding the raw milk testing program. 19/24 incidents resulted from AFL non-conformance, 2/24 incidents resulted from OMAFRA non-conformance, 3/24 incidents resulted from *force majeure* situations. |

| | | |
|---|---|---|
| | | **Over 99.5% of these tests reported met the performance standards of the agreement**.<br><br>Improvements installed over the past year are aimed at eliminating recurrence of specific non-conformances and preventing future ones.<br>Specifically:<br>• Customization of submission documents in collaboration with OMAFRA programs continues to improve sample information consistency.<br>• New Sample Preparation tracking procedure implemented to provide increased information for Chemistry Unit samples.<br>• Enhancement of Microbiology lab processes including replacing manual with automated steps and use of rapid methods.<br>• Continued regular access to key AFL advisory staff on-site at one Stone Road. |
| | | |
| 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: | Baseline is service level standard of 98%. |
| | Target: | Maintain **98% compliance** with service level standard |
| | Results (2013/14): | **100% compliance:**<br>AFL's adherence to 95S-028 continues to be monitored through the IT Adverse Reporting Initiative and Regulatory Partnerships. There were no incidents related to reporting of adverse results in Schedule F programs during 2013/14.<br>The AFL LIMS adverse result alert program reported 1,977 adverse or presumptive positive test results during this fiscal year. These test results were reported to OMAFRA per 95S-028. |
| | | |
| Key Outcome | Capacity and capability to support coordinated and effective emergency management, and the ability and capacity to detect and confirm positive test results to provide effective response to unanticipated / urgent testing | |

| | | |
|---|---|---|
| | requirements and food safety, environmental health and plant health / pest emergencies. | |
| Performance Indicator AFL5 | Effective response to food safety, environmental health and plant health/pest emergencies & unanticipated urgent incidents / requirements in a reasonable timeframe using existing or new methodologies / tests. | |
| | Metric | Evaluation / case study of AFL's response to, and management of significant / unanticipated / urgent situations / events of environmental, health and plant / pest emergencies including any requirement for the development of new AFL tests / methodologies. |
| | Baseline: | Case study approach. |
| | Target: | Completion of case study. |
| | Results (2013/14): | There were four incidents in 2013/14 requiring urgent and effective response. Three incidents occurred in the Foods of Plant Origin Program and one in the Meat Inspection Program.<br>The OMAFRA programs were satisfied and appreciative of the level of response and diligence provided by the AFL. |
| | | |
| Key Outcome | Ability to detect contamination of the food supply and other testing projects through the implementation of statistically valid sampling plans and ensure the cost effective use of available resources. | |
| Performance Indicator AFL6 | Level of compliance with sampling schedule as described in the annual sampling and testing plan agreements and documented in year changes. | |
| | Metric | Percentage compliance with annual Testing and Sampling plans, by program (Schedule F). |
| | Baseline: | Baseline is service level standard of 98%. |
| | Target: | Maintain **98% compliance** with service level standard |
| | Results (2013/14): | The AFL met and exceeded the required **98% compliance** with service level standard [99.8% correct reports; 99.7% turnaround time achieved], achieving the testing requirements as specified in the annual testing and sampling plans for the full list of requested parameters across all programs.<br><br>OMAFRA Sampling Plan Request: 20,728 individual test samples (excluding 108,750 raw milk testing program contract samples)<br><br>AFL Tested: 17,894 individual test samples (per OMAFRA Sample Reconciliation Report for (2013/14)<br><br>The AFL found that 99.8% of the samples submitted by OMAFRA in the Food Safety Program |

| | | |
|---|---|---|
| | | (Dairy, Foods of Plant Origin and Meat) were suitable for testing; 100% of the samples submitted by OMAFRA in the Crop Technology Branch & other programs were suitable for testing.<br><br>OMAFRA strives to reach 100% with its annual sampling and testing plans. Several factors develop throughout the testing year that can affect the ability to meet this compliance goal. They include factors such as: sample collection issues; logistical and resource issues; and various other issues that OMAFRA works diligently to adapt and overcome. Some factors are however outside the control of OMAFRA such as: weather and seasonal issues; licensing issues; processing facilities going out of business; new facilities coming online; and other factors that can affect OMAF and MRA's ability to collect the agreed upon number of samples. |

| Key Outcome | Improved U of G research through laboratory-based expertise. | |
|---|---|---|
| Performance Indicator AFL7 | Contribution of AFL / U of G students to articles, posters and final project reports presented/published. | |
| | Metric (a) | Total number of publications in peer reviewed journals and / or final project reports presented, related to OMAFRA strategic research themes. |
| | Baseline: | There is no existing baseline. Producing more publications year over year does not provide an accurate measure of performance. Continuous improvement and measuring beneficial impacts of contributions is more in line with the intent of this measure |
| | Target: | Demonstration of continued contribution by the AFL; year-to-year fluctuation expected. |
| | Results (2013/14): | • 9 publications in peer-reviewed journals/book chapters and 5 research grant awards.<br>• 1 Post Doctoral Fellow trained under OMAFRA, OCE, MITACS and MOE research grants<br>• 5 Masters students trained under Food Safety and Quality Assurance program of Department of Food Science, University of Guelph<br>• 2 PhD candidates hosted under the Department of Food Science, University of Guelph |
| | | |
| | Metric (b) | Summary of knowledge transfer events re new practices, including number of attendees. |
| | Baseline: | There is no existing baseline. Conducting more events year over year does not provide an accurate measure of performance. Continuous improvement and measuring beneficial impacts of contributions is more in line with the intent of this measure. |
| | Target: | Demonstration of continued contribution by the AFL to knowledge transfer. |
| | Results (2013/14): | Nineteen 19 knowledge transfer events:<br>• 13 oral presentations (50 – 150 attendees)<br>• 6 poster presentations at scientific conferences (20 -100+ attendees) |

# 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

- 2013-2018 Disease Surveillance Plan (DSP) began May 1, 2013; planning for this major initiative got underway.
- AHL responded to the Porcine Epidemic Diarrhea Virus outbreak with testing capacity readied in advance.
- Animal Health Strategic Investment (2008-2013) concluded; AHSI magazine produced June 2013.
- Poultry industry emergency postmortem simulation completed.
- AAVLD accreditation was maintained (audited June 2014), and ISO/IEC 17025 scope of accreditation was expanded to include 'flexible scope'.
- Commissioning of the alkaline digester continued. The enhanced containment level 2 TSE/FAD lab was commissioned.
- Autoalerts of identification of notifiable hazards are sent by email to OMAFRA throughout the day.

- Use of AHL by farm animal vets was stable both geographically and by commodity.
- Continued high level of client satisfaction, and timely diagnostic reporting to OMAFRA.

## Animal Health Laboratory

Performance Indicators

Data collection for each Performance Indicator (PI) was completed with the assistance of OMAFRA. The table below summarizes AHL's 2013/14 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 (report only – no target.)<br>b) Percentage of available working time spent participating on federal/provincial animal health strategy committees |
| | 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.<br>Average per staff member = 2.9% of available working time |
| | Target: | **1.5% – 3.0 %** of available working time |
| | Results (2013/14): | a) 16 of 17 AHL vets/supervisors participated in 81 meetings of 25 international and national organizations (total 635 hrs).<br>17 of 17 AHL vets/supervisors participated in 104 meetings of 22 provincial organizations (total 454 hrs).<br>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 2013/14.<br>**b) Average per staff member:**<br>64.1 meeting hours per year spent on relevant committees, equivalent to **3.7%*** of available |

| | | |
|---|---|---|
| | | working time.<br>*The value presented this year is 3.7% vs. 3.8% in previous years. This is a result of revising the total possible working hours to include 50 weeks/year vs. 52 weeks/year, to account for at least 2 week vacation. |
| | | This PI is supported by a table 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. Two international organizations are included (AAVLD and ACVP), as participating in this capacity contributes to international and national policy. As requested, this tabulation has otherwise been limited to national and provincial bodies or committees to which AHL veterinary staff members belong. Many AHL staff are also ordinary members of various international organizations and local organizations, which have not been included.<br><br>Participation in the large number of provincial and national veterinary organizations provides an opportunity to interact with both private practitioner colleagues as well as industry, and brings a laboratory perspective on issues of the day that impact or inform policy development.<br><br>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 - U of G Agreement. 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 bodies.<br><br>Cross-Canada representation at the Canadian Animal Health Laboratorians Network (CAHLN) in St. Hyacinthe, QC, included provincial, university and federal laboratories (past-president Grant Maxie attended and was named Laboratorian of the Year). Other annual meetings held concurrently were the Canadian Association of Veterinary Pathologists (CAVP), the Canadian Animal Health Surveillance Network (CAHSN), and the TSE Lab Network. |

| Key Outcome | Acts as a critical resource effectively contributing to animal health policy development and in ongoing program delivery for OMAFRA |
|---|---|
| Performance Indicator AHL2 | Diagnostic services offered by the AHL are appropriate to detect hazards* present in Ontario and test results are provided within published turnaround times. |

| | |
|---|---|
| Metric: | Ability of the lab to provide high quality diagnostic services for hazards* within published turnaround times (TATs).<br>*Appendix A & B, Ontario Regulation 277/12. (Reporting of Hazards and Findings). Animal Health Act 2009 |
| Baseline: | N/A |
| Target: | No target to be set |
| Results (2013/14): | AHL, Laboratory Services, University of Guelph |

<u>Notifiable Tests Ordered</u>

| Work item | No. of Work items | No. of Cases |
|---|---|---|
| CFIA African swine fever | 3 | 2 |
| CFIA Anaplasmosis | 1 | 1 |
| CFIA Bluetongue | 2 | 1 |
| CFIA Classical swine fever | 3 | 2 |
| CFIA Scrapie ELISA | 4 | 4 |

<u>Notifiable Tests Completed</u>

| Work item | No. of Work items | No. of Cases |
|---|---|---|
| CFIA African swine fever | 3 | 2 |
| CFIA Anaplasmosis | 1 | 1 |
| CFIA Bluetongue | 2 | 1 |
| CFIA Classical swine fever | 3 | 2 |
| CFIA Scrapie ELISA | 4 | 4 |
| Rabies FA | 83 | 81 |
| Salm Serotyping | 981 | 699 |

Notifiable Ecode Cases

| TME Code | No. of Cases |
|---|---|
| *Chlamydia psittaci* | 1 |
| *Clostridium botulinum* | 2 |
| *Coxiella burnetii* | 7 |
| *Listeria monocytogenes* | 15 |
| avian encephalomyelitis virus (AE) | 1 |
| avian herpesvirus type 1 (AHV-1)/ILT | 5 |

Notifiable Alerts

| Work item | No. of Work items | No. of Cases |
|---|---|---|
| AEV AGID V2 | 15 | 15 |
| AEV rt-RT-PCR | 1 | 1 |
| AIV RT-PCR | 21 | 3 |
| Botulism MIT (Serum) | 2 | 2 |
| *C. burnetii* PCR | 30 | 22 |
| *C. burnetii* ELISA | 2 | 2 |
| *C. psittaci* RT PCR | 2 | 1 |
| CFIA Anaplasmosis | 1 | 1 |
| CFIA Scrapie ELISA | 1 | 1 |
| CWD ELISA | 4 | 1 |
| Cell Cult Isolation | 3 | 1 |
| Culture Bact | 32 | 20 |
| Eq herpesvirus 1 rt PCR | 4 | 4 |
| HSFP Env Culture | 25 | 16 |
| IHC Influenza A Virus | 11 | 11 |
| IHC WNV | 3 | 3 |

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| ILV rt-RT-PCR | 10 | 5 | |
| Influ A vir MultiS-screen | 28 | 5 | |
| *L. monocytogenes* Isol | 5 | 4 | |
| S pullorum-typhoid tube | 2 | 2 | |
| SIF H1N1 ELISA | 1 | 1 | |
| SIF H3N2 ELISA | 6 | 1 | |
| SIF Virus Typing | 10 | 5 | |
| Scrapie ELISA | 1 | 1 | |
| Sw infl RT-PCR | 74 | 27 | |
| VTEC PCR Genotyping | 13 | 9 | |
| WNV IgM ELISA-IOWA | 3 | 3 | |
| WNV rRT-PCR | 48 | 41 | |

A compilation of emerging hazards and first-diagnoses in Ontario is maintained and updated frequently by Dr. Beverly McEwen as the "*Impact of the AHL diagnostic system on issues of animal health, public health and trade related to Ontario's livestock and poultry industries*". This document, currently 12 pages long, is shared with OMAFRA. Examples of events in 2013/14 included an outbreak of neuropathogenic equine herpesvirus 1, *Anaplasma marginale* in cattle, and PEDV and PDCov in swine.

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| 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: | For 2008/09,<br>By Commodity: Equine (EQ): 70%; Food Animal (FA): 73%<br>By Geographic Area: North 64% Central 58%; East 78% West 65%<br>≥ 65% for each commodity; ≥ 60% for each region |

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| | | By Commodity<br><br>Food Animal (FA): Proportion of FA accredited facilities submitting FA samples to the AHL = 276/282 (97.8%)<br><br>Numerator: total number of accredited facilities with FA submissions (whether or not they are identified as FA accredited facilities in the CVO database)<br>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<br><br>By Geographic Area (Area Code)<br><br>Proportion of EQ & FA accredited facilities in each area submitting EQ and/or FA samples to the AHL:<br>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).<br>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.<br><br>North Area Code 705, 289, 807 = (Average 37.3%)<br>East Area Code 613 = (70.9%)<br>Central Area Code 416, 647, 905, = (Average: 72.7%)<br>West Area Code 519 = (90.7%)<br><br>Equine: Proportion of EQ accredited facilities submitting EQ samples to the AHL = 207/462 (44.8%)<br><br>Numerator: total number of accredited facilities with EQ submissions (whether or not they are identified as EQ accredited facilities in the CVO database)<br>Denominator: total number of Ontario accredited facilities identified as EQ in the CVO database (whether or not they actually do any equine work) + all other accredited facilities which have submitted EQ samples to the AHL |
| | Target: | 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 |

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| | | submitted EQ or FA samples (respectively) to the AHL.<br><br>Note: The difference between the reported percentage and the actual percentage is a result of the fact that some companion animal clinics hold food animal certifications for the purposes of dispensing medication but do little to no actual diagnostic work with food animals. As a result, the denominator is artificially large with a resulting lower percentage. All Ontario food animal and equine practitioners are aware of the availability of AHL services, and are able to access AHL resources on an as-needed basis.<br><br>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 FA samples to the AHL, and is presented by region, using telephone area code. |
| | Results (2013/14): | |
| | | 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.<br><br>Note: The difference between the reported percentage and the actual percentage is a result of the fact that some companion animal clinics hold food animal certifications for the purposes of dispensing medication but do little to no actual diagnostic work with food animals. As a result, the denominator is artificially large with a resulting lower percentage. All Ontario food animal and equine practitioners are aware of the availability of AHL services, and are able to access AHL resources on an as-needed basis.<br><br>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 FA 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 | Timely communication of relevant changes in the patterns of existing disease or the appearance of new | |

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| Indicator AHL4 | 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 (2008/09) |
| | Target: | **≥ 90%** satisfaction rating |
| | Results (2013/14): | By agreement with OMAFRA, the AHL Client Satisfaction Survey is conducted biennially, rather than annually. This survey was conducted in fall 2013, and will be again in 2015. Of the 900 surveys sent to clients, 100 (11.1%) were returned.<br>As an additional documented form of feedback on client service, minutes of the bi-monthly AHL/OVC-HSC/PBI liaison meetings (AHL, OVC Health Sciences Center, and Pathobiology) and the annual AHL Feedback Group meeting (a range of AHL clients attend) were reviewed. Meeting minutes are available upon request. Satisfaction is high with the timeliness of communications; however we do not have a numerical satisfaction rating.<br><br>*Question 12: Communication of relevant changes in disease occurrences is timely.*<br>***96%** of clients responding to this survey question were satisfied with the timeliness of communication of relevant changes in disease occurrences. Analysis of results from bi-annually AHL client satisfaction survey question 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, 4, and 5) to the total number of clients responding.* |

| Key Outcome | Early detection and effective response to foreign animal diseases and other serious diseases with human/animal health or economic consequences | |
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| 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<br>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: | Satisfactory handling of all cases by AHL |
| | Results (2013/14): | a) The AHL selected 4 cases from their 2013/14 caseload, with potential significance to animal health and/or public health. The 4 cases were:<br><br>1. Index case of porcine epidemic diarrhea (PED) in Ontario and Canada<br>2. A case of fowl cholera in 43-week-old broiler-breeders in Ontario<br>3. Cases of Equine herpesvirus-1 neuropathogenic strain at Woodbine Racetrack, Toronto ON, summer 2013<br>4. Salmonellosis in a group of bearded dragons, July 2013<br><br>Excerpts from the OMAFRA evaluation, completed in January 2015, are as follows:<br><br><u>1.0 Case G14-005413</u><br>Index case of porcine epidemic diarrhea (PED) in Ontario and Canada<br>*Drs. Murray Hazlett, Davor Ojkic, Jim Fairles*<br>OMAFRA comment:<br>The AHL led the development of a test for PEDV in Canada. The test was developed and validated well in advance of the PEDV outbreak and then was distributed to all labs in the Canadian Animal Health Laboratory Network. The test was later combined into a panel that tested for other swine coronaviruses (transmissible gastroenteritis and porcine delta coronavirus). The test successfully detected the first case of PEDV in Canada.<br>Dr. Tim Pasma |

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| | | 2.0 Case G14-019472<br>A case of fowl cholera in 43-week-old broiler-breeders in Ontario<br>*Dr. Emily Martin*<br>OMAFRA comment:<br>Dr. Martin followed the required diagnostic steps during her evaluation of this case. Despite the non-pathognomonic presentation of Fowl Cholera (Otitis media, bacterial osteomyelitis of cranial bones, meningitis) the laboratory identified Pasteurella multocida as a causative agent. A full differential diagnosis was performed to exclude Avian Influenza, Newcastle disease, and Mycoplasma as causative agents. Dr. Martin, on further enquiry, found out that the flock had been vaccinated against fowl cholera, and mortality decreased to the normal level. Indicating the vaccination history of birds was effective to guide OMAFRA's internal risk assessment. The diagnostic techniques used were accurate and timely, and reporting protocols were thoroughly followed.<br>Dr. Csaba Varga<br><br>3.0 Cases G14- 044836, G14-044943, G14-045157, G14-045161, G14-045168<br>Cases of Equine herpesvirus-1 neuropathogenic strain at Woodbine Racetrack, Toronto ON, summer 2013<br>*Drs. Davor Ojkic, Jim Fairles*<br>OMAFRA comment:<br>Although I wasn't at OMAFRA during the time of the EHV-1 outbreak, I was involved as a practitioner. I believe the events described by AHL were accurate. The samples were run in a very efficient manner and the ramping up of the testing, the attention to courier service, providing testing material and a very fast turnaround time were critical to control. OMAFRA was able to assist the ORC and practitioners in preventing the spread of the disease from Barn 1 to the rest of the backstretch and outside of the track boundaries and affecting the economics of racing for a protracted period of time.<br>Dr. Alison Moore<br><br>4.0 Case G13- 055204<br>Salmonellosis in a group of bearded dragons, July 2013<br>*Dr. Marina Brash*<br>OMAFRA comment:<br>OMAFRA did not take any further action on this case since Salmonella is commonly isolated from reptiles. The veterinarian had been directed to notify his client of the zoonotic potential by both Dr. Brash and the standard comment in the report, so this aspect of the case had already been taken |

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| | | care of.<br><br>OMAFRA would take action, including notifying MOHLTC, if there were increasing numbers of cases of this type.<br>Dr. Janet Alsop<br><br>b) <u>Utilization of the Lab by 3rd party sources</u><br>The AHL was used by approximately 118 third-party sources (excluding OMAFRA and Ontario veterinary clinics), including 10 federal ministries, 1 Ontario ministry, and approximately 108 other private organizations including other diagnostic laboratories, large FA producers, genetic and cell line companies, feed companies, shipping companies, Canadian universities, Canadian hospitals and more.<br><br>*Each complete case description and narrative prepared by the AHL (along with the case evaluations prepared by OMAFRA staff) is available upon request.* |

| Key Outcome | Diagnostics/tests meet best practice standards | |
|---|---|---|
| Performance Indicator AHL6 | The University maintains appropriate accreditations at the Animal Health Laboratory, but not limited to AAVLD, CFIA and ISO registration | |
| | Metric: | a) Review of accreditation reports in order to assess performance and maintenance of accreditation<br>b) Review of client satisfaction survey in order to assess performance<br>c) Review of actual adherence to published turnaround times (TATs)<br>d) Review of proficiency testing results to assess performance |
| | Baseline(a): | 2008/2009 AHL accreditations & certifications |
| | Target: | Maintenance of accreditations & certifications |
| | Results (2013/14): | a) <u>Review of accreditation reports:</u><br><br>The University maintains appropriate accreditations at the Animal Health Laboratory (AHL), including ISO/IEC 17025, AAVLD and CFIA.<br>American Association of Veterinary Laboratory Diagnosticians (AAVLD) accreditation<br>AHL is accredited by the AAVLD, meeting AAVLD accreditation requirements for full accreditation, all species. For 2013/14, AHL maintained AAVLD accreditation. The AAVLD accreditation follows a 5-year cycle; the AAVLD accreditation site visit was June 15-19, 2014. . Four assessors inspected the AHL quality program, facilities and diagnostic testing. AHL is waiting for the official site visit report from the AAVLD Accreditation Committee.<br><br>*<u>ISO/IEC 17025 accreditation</u>*<br>LSD, including AHL, is accredited by both of Canada's internationally recognized accrediting bodies, the Standard Council of Canada (SCC) and the Canadian Association for Laboratory Accreditation (CALA) to the ISO/IEC 17025 standard, for specific tests listed on our scopes of accreditation.<br><br>LSD/AHL is accredited by SCC in the program specialty areas (PSAs): Agriculture Inputs, Food, Animal Health and Plant Protection (AFAP) and Test Method Development and Evaluation and Non-routing Testing (TMNENRT). As of August 11, 2014 LSD had 120 tests in AFAP PSA including 20 tests performed by AHL. |

On March 16, 2013, AHL applied to add the 3 tests to the scope of accreditation:

1. BAC-028 Culture detection of *Salmonella* spp. in hatchery samples and in poultry environmental samples
2. BAC-029 Culture detection of *Salmonella* Pullorum*, Salmonella* Gallinarum and other *Salmonella* spp.
3. MYC-117 *Mycoplasma hyopneumoniae* ELISA.

BAC-028 and BAC-029 support the Ontario Hatchery and Supply Flock program.
The three tests were officially added to the scope of testing on July 29, 2013.

The SCC biennial assessment occurred October 1-4, 2014. Eight assessors audited Laboratory Services quality system and accredited tests for 4 days. As part of the biennial assessment, AHL expanded it scope of accreditation to include:

1. the program specialty field, Test Method Development and Non-routine testing, which includes two procedures:
    a. AHL-011 Bench and field validation for AHL laboratory tests
    b. AHL-050 Management of AHL test method development and non-routine testing
2. three additional tests
    a. CHEM-055 ICP-MS analysis of metals in tissues
    b. CHEM-057 Determination of iodine in raw and processed milk by inductively coupled plasma-mass spectrometry
    c. V-005 Polymerase Chain Reaction – Type A influenza viruses and Avian H5 and H7 Heamagglutinin subtypes, Avian Paramyxovirus type 1 (APMV-1), Classical Swine Fever, Foot and Mouth Disease
3. a flexible scope under Medical, Veterinary

The flexible scope is the accreditation of the laboratory by techniques. AHL's flexible scope of accreditation is:

<u>Veterinary:</u>

Description of Activities:
The Animal Health Laboratory identifies unknown hazards in a range of matrices, for example, animal samples, feed, soil, plants. Hazards include infectious agents (bacteria, mycoplasmas, yeast, molds, viruses, and parasites), organic and inorganic elements and compounds. Infectious agents are detected directly or indirectly through various technologies, for example, culture, ELISA and PCR,

Techniques for which the laboratory is accredited:

1. Culture detection of microorganisms
2. Inorganic analysis by inductively coupled plasma spectroscopy (ICP)
3. Enzyme linked immunosorbent assay (ELISA)
4. Agglutination
5. Polymerase chain reaction

In conjunction with the AHL director's office, the quality assurance unit manages the list of tests under the flexible scope of accreditation. As it names applies, the flexible scope allows the laboratory greater flexibility to add tests to the scope of accreditation. All tests listed under the flexible scope of accreditation meet the same requirements of tests listed on the SCC fixed scope of accreditation.

LSD/AHL submitted the response to the SCC biennial assessment on November 11, 2013. The new scope of accreditation was formally accepted and posted to the SCC website on May 29, 2014.

Following the SCC approval of the flexible scope and due to re-organization and streamlining of tests, AHL withdrew accreditation of 4 individual tests on June 26, 2014.

LSD/AHL is accredited by the Canadian Association for Laboratory Accreditation (CALA) for 15 environmental tests, including 3 AHL tests. The CALA biennial assessment occurred Oct 1-4, 2014. All assessment findings were resolved and accepted by CALA on February 18, 2014.

*Canadian Food Inspection Agency (CFIA) accreditation*
AHL is accredited by the CFIA – Retrovirology Centre for Expertise (RCE) for, equine infectious anemia (EIA) ELISA testing. In 2013/14, AHL maintained this accreditation.

Baseline / Target / Results(b/c)

| Target | Baseline 2008/09 | Results 2013/14 |
|---|---|---|
| **≥ 90%** satisfaction rating | 96% satisfaction rating | 96% satisfaction rating<br>**95.1**% AHL TAT rating |

Results (2013/14):

b) Review of client satisfaction survey

By agreement with OMAFRA, the AHL Client Satisfaction Survey will be conducted biennially,

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| | | rather than annually. This survey was conducted in fall 2013. Alternative support documentation includes feedback on client service, minutes of the bi-monthly AHL/OVC-HSC/PBI liaison meetings (AHL, OVC Health Sciences Center Veterinary Teaching Hospital, Pathobiology) and the annual AHL Feedback Group meeting (a range of AHL clients attend) were reviewed.<br><br>Meeting minutes are available upon request.<br><br>*Question 1: Employees respond in a timely manner*<br>*Question 4: Published turnaround times are met*<br><br>*Of clients responding to the 2013 survey, 95% were satisfied with the timeliness of employee response, and 97% were satisfied that published turnaround times were met. The average satisfaction rating was **96%***<br><br>c) <u>Review of adherence to published turn around times (TATS)</u><br><br>The actual adherence to published turnaround times from the AHL Laboratory Information Management Systems (LIMS) was **95.1%.**<br><br>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.<br>The AHL has done this by proactively measuring and analyzing their TAT performance to identify areas needing continuous improvement. A component of the AHL's AAVLD accreditation is an analysis of the adherence to quoted TAT expectations as published in the AHL User's Guide and Fee Schedule.<br>A detailed explanation of the 2013/2014 TAT statistics report is available upon request. |
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| | Baseline (d): | d) <u>Review of Proficiency Testing Results</u><br>Performance on Proficiency Test (PT) Panels :<br>Biological Panels: 98% pass rate<br>Chemistry Panels: 95% satisfactory<br>3% questionable<br>2% unsatisfactory |

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| | Target: | Biological Panels:<br>**≥ 95%** pass rate<br>Chemistry Panels:<br>**≥ 95%** satisfactory rating |
| | Results (2013/14): | The AHL participated in 40 different proficiency test (PT) programs in 2013/14. PT programs are divided into 2 main categories:<br>1. Biological programs – a panel of samples is tested, or identification agrees with consensus ID and results are usually pass / fail.<br>2. Chemical programs produce numerical results and the results are usually categorized as satisfactory, questionable, or unsatisfactory.<br><br>When a PT result is identified as questionable or unsatisfactory, the problem is investigated, and, for unsatisfactory results, corrective action is applied and documented.<br><br>Chemical PT programs<br>In 2013/14 the chemical sections of AHL, Clinical Pathology and Toxicology/ Soil & Nutrient, participated in 21 different PT programs. Note that multiple sets of samples were tested within each PT program.<br><br>In 2013/14, AHL reported over 1,400 chemical PT results. The numbers of reported results are down from last year due to problems receiving MAP, NAPT and RIQAS proficiency samples. The OMAFRA soil PT program results are not included in these totals since the OMAFRA soil PT program is based on NAPT proficiency samples results and including both programs would double count results. A summary of chemical PT results is available for onsite review.<br><br>Overall, the **chemistry** results are as follows:<br>1. **satisfactory 97.5%** (satisfactory = 94.6% acceptable and 2.8% questionable)<br>2. **unsatisfactory 2.5%**<br>Biological PT programs<br>In 2013/14 AHL reported 106 **biological results** or panels as shown in Table 1 (next page) and **98.1%** of results were satisfactory (satisfactory = 97.2% acceptable and 0.9% questionable). |

**Table 1. 2013/14 AHL Biological Proficiency Results**

| Lab Section | Proficiency program | Parameter | Scoring criteria | Results reported |
|---|---|---|---|---|
| Bacti | NVSL – Johne's Direct PCR & Liquid Media (Bacti= Bacteriology) | Johne's disease fecal proficiency panel (*Liquid media results pending*) | Panel passes if 3 non-critical samples or less were missed | 2 |
| Bacti | VLA QAP Bacteriology | Disease diagnosis and susceptibility | Agrees with benchmark result | 2 |
| Bacti | VLA VETQAS | Salmonella | Agrees with benchmark result | 10 |
| Histology | UKNEQAS (Immunochemistry) | Veterinary Immunocyto-chemistry | Comparison of results | 20 |
| Mol Biol | CFIA Scrapie panel exchange | Scrapie genotype: 10 CFIA samples tested by 3 AHL analysts. 10 AHL samples/ results confirmed by CFIA | Agree with reference lab (CFIA) | 39 |
| Parasitology | VLA-QAP parasitology | Parasite identification | Agrees with consensus ID | 4 |
| Pathology | VLA-QAP Histopathology | Disease diagnosis | Agrees with consensus ID | 3 |
| Virology | NVSL Johne's proficiency | Johne's diagnosis (serology) | Agree with consensus diagnosis | |
| Virology | CFIA- BSE | BSE panel | Panel passes | 4 |
| Virology | CFIA-CWD | CWD & scrapie panel - certified analysts | Analyst passes panel | 4 |
| Virology | CFIA EIA | EIA panel - certified analysts | Analyst passes panel | 9 |
| Virology | CFIA (CAHSN) | FMD ELISA | Analyst passes panel | 4 |

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| Virology | CFIA (CAHSN) | AIV ELISA | Analyst passes panel | 1 |
| Virology | CFIA (CAHSN) | CSF real-time PCR | Analyst passes panel | 2 |
| Virology | CFIA (CAHSN) | AIV/APMV rRT-PCR | Analyst passes panel | 6 |
| Virology | CFIA (CAHSN) | AIV AGID panel | Analyst passes panel | |
| Virology | CFIA (CAHSN) | FMD PCR | Analyst passes panel | 3 |
| Virology | ILS - *Leptospira* | *Leptospira* panel | Panel passes | |
| Virology | Boehringer-Ingelheim | PRRSV rtRT-PCR | Comparison with other labs | 20 |
| Virology | Boehringer-Ingelheim | PCV-2 rtPCR | Comparison with other labs | 10 |
| Virology | USDA, APHIS, NVSL | PRRSV X3 antibody ELISA | Assessment for improvement | 20 |
| Virology | USDA, APHIS, NVSL | PRRSV IFA antibody North American | Assessment for improvement | 20 |
| Virology | USDA, APHIS, NVSL | PRRSV IFA antibody Euro-like | Assessment for improvement | 20 |

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| 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: | **≥ 90%** satisfaction rating |
| | Results (2013/14): | By agreement with OMAFRA, the AHL Client Satisfaction Survey is conducted biennially, rather than annually. This survey was conducted in fall 2013. Alternative support documentation includes feedback on client service, minutes of the bi-monthly AHL/OVC-HSC/PBI liaison meetings (AHL, OVC Health Sciences Center, Veterinary Teaching Hospital, Pathobiology) and the annual AHL |

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| | | Feedback Group meeting (a range of AHL clients attend) were reviewed.<br>Meeting minutes are available upon request.<br>*Question 5: Telephone enquiries are handled well.*<br>overall satisfaction rating of 95%, i.e. ratings of 5,4,3.<br>*Question 6: Email enquiries are handled well.*<br>overall satisfaction rating of 94%<br>*Question 8: Test results assist in problem solving.*<br>overall satisfaction rating of 99%<br>*Question 13: The services provided by AHL meet my organization's needs.*<br>overall satisfaction rating of 99%<br>*Question 15: What has been your average overall level of satisfaction with service from the AHL?*<br>overall satisfaction rating of 97%<br>*Question 17: Will you continue to use the services of the AHL? 99%*<br>*Question 18: Would you recommend the AHL to others? 94%*<br>*96.5% of clients responded YES to the above two questions.*<br><br>***Overall, the average satisfaction rating for the above questions was 96.7%***<br><br>Client responses (as above) show an across-the-board high level of satisfaction with the AHL services. There has been significant improvement to the services that AHL provides including,<br>• AHL / IT Is working on a program to produce a compiled report for clients.<br>• "Specimen receipt confirmation" created for the client which states that "the information above is based on our interpretation of your submission form and lists the testing procedures that we have ordered in our LIMS." This allows the client to make any adjustments to their submission.<br><br>There are additional areas for improvement, some of which were identified by clients. For example, the following comments contain suggestions for improvement:<br>"Personally prefers when emails contain web-links. Highlights relevant topics with option to expand."<br>The digital version of the AHL newsletter now contains highlights and links to each article in the email to the newsletter on our website. Clients also received the pdf copy of the quarterly |

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| | | newsletter emailed to them to also view or print.<br>“Clients would be willing to pay more for faster results”<br>Virology is now working on streamlining results in order to provide next day results on most tests for clients.<br>“”…make submission form totally computerized and end the use of the paper submission form which is cumbersome and takes too long”<br>AHL is updating all of the submission forms and making them fillable pdf versions. |
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| 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: | Adherence to the milestones in Schedule G of the OMAFRA - U of G Agreement |
| | Baseline: | Years 1 to 5: milestones as defined in Schedule G of the Agreement |
| | Target: | Years 5 to 10: After the Year 5 review, the Parties shall develop further milestones for the balance of the term of the Agreement |
| | Results (2013/14): | Several activities involving the AHL occurred in 2013/14 related to emergency preparedness.<br><br>**AHL Guelph Postmortem FAD Emergency Exercise**<br>“Sneezing chicken disease” Simulation<br>November 6, 2013<br><br>Exercise summary and after action plans:<br><br>On November 6, 2013, a foreign animal disease (FAD) emergency exercise of “sneezing chicken disease” (highly pathogenic avian influenza) was held at the AHL Guelph postmortem laboratory. The objectives were to test and validate the Standard Operating Procedure (SOP) *AHL-046 Postmortem procedures for handling a reportable/foreign animal disease (FAD) suspect*, and to evaluate joint co-ordination and communication among the AHL, Department of Pathobiology (OVC), University of Guelph, and the Canadian Food Inspection Agency. |

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| | | Participants at the AHL Laboratory included Dr. Emily Martin, Dr. Maria Spinato, Ms. Megan MacAlpine, Mr. Rick Roth. External evaluator was Dr. Csaba Varga, OMAFRA.<br><br>Comments from the various stakeholders and after-action plans included:<br><br><u>CFIA</u> - Dr. Robyn Budgeon:<br>Dr. Budgeon attended the hotwash and reviewed notification protocols with attendees. She confirmed that the tentative diagnosis of a FAD should not be released to the client. If asked for PM findings, staff should respond "We have forwarded the samples to CFIA. Please contact the CFIA for additional information". The LIMS report should not be released to the client.<br><br>Dr. Budgeon offered CFIA resources to arrange a training session for AHL and OMAF staff involving donning/doffing and sample collection/decontamination procedures.<br>Action #1: Maria will co-ordinate CFIA training session at the AHL.<br><br><u>OMAF Evaluator</u> - Dr. Csaba Varga:<br>Dr. Varga commented that the simulation was well-organized and participants were knowledgeable and well-prepared. Resources were judged to be sufficient to meet the goals of the exercise, and communication networks among the AHL and government authorities functioned successfully.<br>Recommendations by the official evaluator were to ensure farm identification information is included by the submitter to facilitate timely disease control responses, to develop a user-friendly flow chart for pathologists/technicians that could be posted for easy reference, and to facilitate consultation by emailing digital photographs of gross lesions to other pathologists/veterinarians.<br>Action #:2 Emily will develop a flow chart and consult with mammalian pathologist(s).<br><br><u>AHL Staff:</u><br>1) FAD SOP is difficult to follow.<br>Action #3: Emily and Maria will revise FAD SOP and prepare flow chart as an appendix for easier reference.<br><br>2) There was confusion among SR and Virology lab staff related to sample management from PM room →SR →Virology.<br>Action #4: Emily and Maria will raise this issue at January 16 MTM for additional discussion.<br><br>3) SR entry was not considered "contaminated" for the purpose of this exercise. Who will co- |

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| | | ordinate decontamination if required?<br>Action #5: Emily and Maria will raise this issue at January 16 MTM for additional discussion.<br><br>4) Removal of PPE/PAPR was difficult to perform. See action item #1.<br>5) Clothing in the shower room was insufficient (inappropriate sizes).<br>Action #6: Megan will stock the shower room with additional clothing in appropriate sizes. The FAD kits in 1841, 1843 and dictation room will also be restocked and include sufficient disease alert signs.<br><br>Maria Spinato January 10, 2014<br>Pathologist, Postmortem Supervisor<br>Animal Health Laboratory<br>University of Guelph<br><br>**Exercise summary: AHL-Kemptville Emergency FAD Exercise Oct 11, 2013**<br><br>On October 11, 2013 a foreign animal disease (FAD) simulation of avian influenza was held at the AHL-Kemptville necropsy facility. The role of the AHL-Kemptville was to perform a necropsy of commercial layer birds, and, following our Standard Operating Procedure (SOP) *AHL-K-016- Post mortem room and general laboratory procedures for handling a foreign animal disease (FAD) suspect*, conduct the appropriate sampling, decontamination and reporting.<br><br>The AHL-Kemptville participants were Dr. Andrew Brooks, Dr. Jan Shapiro, Mr. Tom McLean. The external evaluators were Dr. Erin Wilson (CFIA Ottawa District Office) and Dr. James Byrne (CFIA Brockville District Office).<br><br>The AHL-Kemptville was assessed by the evaluators as having fully met the objectives within the scope of the exercise. Participants were well-prepared and all tasks were completed within the suggested time limits.<br><br>Comments and recommendations from the evaluators and action items for continued improvement:<br><br>*Exercise objective #1* • Establish a secure perimeter to limit entry and exposure of additional people.<br>Evaluator comment/recommendation: Can someone else be tasked with this role other than a |

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| | | pathologist? Campus security?<br><br>***Response:*** *SOP AHL K – 016 section 5.2.3.1.2 states that if an AHL staff member is not available to lock the doors and post disease alert signs the physical plant supervisor or a designate may be asked to do this. However, to date physical plant personnel have not participated in a simulation. Action: In the 2014 simulation we will involve physical plant personnel in the securing of the laboratory. (Assigned to A. Brooks Oct 2014)*<br><br>*Exercise objective #3* • Collect samples from suspect carcass, package and disinfect container.<br>Evaluator comment/recommendation: CFIA may expect duplicate samples e.g. one set for NCFAD Winnipeg and one for AHL Guelph.<br><br>***Response:*** *SOP AHL K – 016 section 5.2.1.1 states that the attending pathologist receives guidance from CFIA regarding sample collection. Duplicate samples (formalin fixed and non-fixed samples) can be readily obtained and a set of samples can be held in the AHL Kemptville postmortem room (formalin fixed tissues can be stored at room temperature, other samples can be stored either chilled or frozen in the postmortem room).*<br><br>*Exercise objective #4* • Dispose of suspect carcass.<br>Evaluator comment/recommendation: The AHL Kemptville is currently using an elderly incinerator. May have to be switched to a digester in the future.<br><br>***Response:*** *The incinerator has been in operation since 1980. Since that time the incinerator has undergone extensive modifications including switching from burning oil to natural gas and a complete re-line of the refractory, in addition to other repairs. Presently the incinerator is in good working order and is inspected annually for overall function by the electrical and HVAC service providers. The refractory is inspected biennially. Function of the incinerator is observed and recorded (as of the current draft version of SOP-K-011) during each burn such that any problems should be detected and corrected early. Frequency of use has declined significantly over the past few years, since most routine carcass waste is now sent for rendering, which should extend the lifespan of the incinerator. However, in the event of a FAD-suspect, SOP AHL K – 016 does not sufficiently describe contingency plans for carcass disposal should the incinerator be out of service.*<br>*Action: SOP AHL K – 016 should be modified to describe the contingency plan for disposal of a FAD-suspect carcass if the incinerator is not in operation. (Assigned to A. Brooks June 2014)* |

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| | | *Exercise objective #5* • Disinfect necropsy lab.<br>Evaluator comment/recommendation: Review the Virkon® percent for Newcastle disease and salmonella.<br><br>***Response*****:** *SOP AHL – 035 PM Room Cleaning and Disinfection Procedures states that the Virkon® percentage for disinfecting Salmonella pullorum is 2% with contact time of 10 minutes, for other Salmonella species 1%. The Virkon® percentage for Newcastle disease is 2% with contact time of 10 minutes. This particular exercise involved influenza which requires a 1% Virkon® concentration with minimum contact time of 10 minutes.*<br><br>Evaluator comments/recommendation: The discussion about disinfecting surfaces outside the lab did not occur – time constraints for purposes of exercise.<br><br>***Response****: Some areas (i.e. unloading dock, walk in cooler) were excluded from the scope of the exercise in the pre-exercise meeting in order to ensure that the exercise was completed on time and to ensure that specimens could be received (there was a horse en route to the lab for postmortem that morning). Accordingly, the expected actions for this objective in the evaluation guide indicated that some decontamination was excluded from the exercise scope.*<br><br>*Exercise objective #6* • Decontaminate exposed personnel.<br>Evaluator comment/recommendation: Importance of nasal passages in carrying virus, blowing nose? Leave Kleenex with contaminated disposables.<br><br>***Response:*** *SOP AHL – K – 016 indicates in appendix 11.1 that there is a risk of a virus being transported in the nose and throat, but the SOP does not sufficiently describe the procedure of blowing the nose and disposition of the potentially contaminated tissue.*<br>*Action: SOP AHL – K – 016 should be reviewed and modified if necessary to clarify this step in the decontamination of personnel. (Assigned to A. Brooks June 2014)*<br><br>*Exercise objective #7* • Exit from Necropsy Lab.<br>Evaluator comments/recommendation: May be overkill, but disinfect areas upstairs, fridge, after samples leave.<br><br>***Response:*** *In section 5.2.4 of SOP AHL – K – 016 the client reception area and trim room floors are disinfected with Virkon® and the door handles are sprayed with Lysol. These disinfection steps* |

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| | | *occur after the laboratory has been locked down. Also, in AHL – K – 016 all non-fixed samples leaving the postmortem room are double bagged, the outer bag is then surface disinfected in Virkon® for 15 minutes and then placed in a 3rd clean biohazard bag as the samples are transferred out of the postmortem room. The histology jars are also surface disinfected with Virkon® for 15 minutes. The risk of contaminating the fridge (or other surfaces) in which samples are held pending pickup by CFIA is minimal but the SOP does not specifically address decontaminating these surfaces.*<br>*Action: Review AHL SOP K– 016, and revise if necessary, instructions for disinfection of surfaces that might be contaminated by the samples while awaiting pickup by CFIA. (Assigned to A. Brooks June 2014)*<br><br>Evaluator comment/recommendation: Personnel in contact with livestock will be referred to CFIA for recommendations on going home.<br><br>***Response:*** *Some AHL Kemptville staff either have livestock at home or live in close proximity to livestock. SOP AHL – K – 016 appendix 11.1 states that it is generally recommended that a person who has been in contact with infected animals should not go near susceptible animals for 3 days. In the event of a FAD-suspect, the SOP also refers personnel with any questions regarding a particular disease agent or susceptible species to contact CFIA for further information.*<br><br>Additional comments from the evaluators:<br>1. Good knowledge of traffic flow patterns into the building. Targeted priority entrances first.<br>2. Good adherence to contact time for disinfection.<br>3. Excellent job taking the exercise seriously.<br>4. Efficient use of phone lists.<br>5. Good job having pre-arranged notification lists.<br><br>Andrew Brooks<br>Pathologist, Laboratory Head - Kemptville<br>Animal Health Laboratory<br>University of Guelph, Kemptville Campus<br><br>The FAD exercise was deemed a success in both of the AHL postmortem laboratories. Plans are underway to address the recommendations of evaluators. It is anticipated that the AHL will conduct annual table-top or operational exercises to enhance and maintain its emergency preparedness status. |

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| | | On March 19-20, 2014, Dr. Maxie participated in a foot-and-mouth disease table-top exercise in Ottawa organized by CFIA to further test the capability of CAHSN laboratories across Canada to respond effectively to a serious FAD incursion. The AHL is well prepared to respond and has adequate surge capacity to deal with up to 1,000 PCR tests per day, which could be needed in the recovery phase of an FAD outbreak.<br><br>With the conduct of the notifiable exercise and the participation in a full disease outbreak simulation, the Milestones as defined in Schedule G of the Agreement were achieved. |
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| 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: | **≥ 85 %** satisfaction rating |
| | Results (2013/14): | *<u>Question 14:</u> Animal Health Lab uses AHL Newsletters and our website as well as meeting updates, scientific publications, and personal email and telephone consultation for knowledge transfer to veterinarians.*<br><br>These were ranked in their effectiveness: 5= very effective, 1=not effective.<br><br>Many clients (68% of survey respondents) are aware of and use the AHL Newsletter, LabNotes and/or the AHL website, with 91.3% of those respondents finding them effective. Awareness of meeting updates and use of scientific publications was somewhat less (42%), but of those, 91.2% found them effective. Of all survey respondents, 81% were aware of and make use of personal email and telephone consultation with 97.6% of those finding these consultations effective. **Overall, the satisfaction rating for this question was 93.4%**<br><br>*<u>Question 20:</u> Do you receive sufficient information of testing services that are available from the AHL?*<br>78% of respondents said YES and 12% said NO |

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| | | **Overall, the satisfaction rating was 85.5%**<br><br>By agreement with OMAFRA, the AHL Client Satisfaction Survey will be conducted biennially, rather than annually. This survey was conducted in fall 2013. As an alternative documented form of feedback on client service, minutes of the bi-monthly AHL/OVC-HSC/PBI liaison meetings (AHL, OVC Health Sciences Center -Veterinary Teaching Hospital and Pathobiology) and the annual AHL Feedback Group meeting (a range of AHL clients attend) were reviewed.<br><br>Meeting minutes are available upon request.<br><br>Many clients are aware of and use the AHL Newsletter, LabNotes and/or the AHL website. Knowledge transfer from the AHL to clients and partners occurs via in-person discussions, newsletters, contributions of scientific articles, and peer-reviewed publications.<br><br>The 17 veterinarians/supervisors 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, who is AHL's Client Service Veterinarian, provides frequent updates to the Ontario Association of Swine Veterinarians and the Ontario Association of Bovine Practitioners.<br><br>More broadly, the AHL provides a wealth of information with emphasis on disease trend updates in the quarterly AHL Newsletter, which is distributed widely as well as being posted on the AHL website, and is well regarded. As well, AHL staff occasionally submit contributions to OMAFRA's newsletter, "Ceptor".<br><br>AHL staff are regular participants at numerous conferences, e.g., the OVMA annual conference, both as exhibitors, and as guest speakers or expert panel members. Dr. Fairles (supported by Ms. Josie Given), actively markets the services of the AHL, and is in regular contact with AHL clients.<br><br>As a matter of course, the AHL has added many new testing methodologies and tests; such, as the PEDV-TGEV-PDCoV triplex PCR test, 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., concerns surrounding chicken jerky products for dogs, testing of undifferentiated diarrhea in pigs. |

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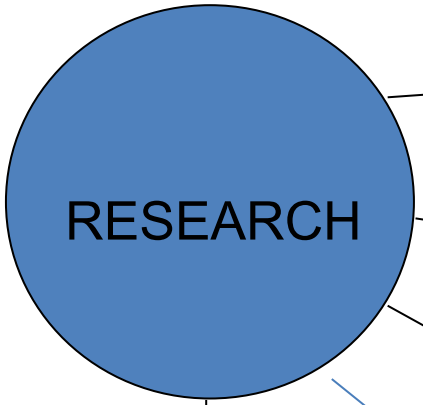
| | | Finally, AHL staff contribute to a number of peer-reviewed scientific publications every year.<br>From the analysis of survey questions related to knowledge transfer effectiveness, there are some areas for potential improvement which should be considered.<br><br>While, in general, client responses 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. The planned expert networks within the DSP should help to address this opportunity for improvement. |

# 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 funding restored to all seven OMAFRA priority areas.

Strategic review of Knowledge Translation & Transfer program in 2013 informs knowledge mobilization research projects and events.

'Gryphon's LAAIR' program launched to move research technologies toward commercialization

New industry liaison and germplasm technology transfer positions result in 24 new academic-industry research partnerships.

Returns to the germplasm portfolio accounted for 42% of total royalty revenues in 2013/14.

Number of Highly Qualified Personnel Program graduates reaches 100.

Construction progress made in the Livestock Research & Innovation Centre (LRIC) – dairy facility.

LRIC is part of ARIO's ten year infrastructure strategy to provide modern research capacity needed by Ontario's agri-food industry.

## Research Program

Performance Indicators

Data collection for each Performance Indicator (PI) was completed 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 U of G's Catalyst Centre and Budget Office.

| Key Outcome | Research programs reflect OMAFRA strategic needs, coordinate U of G's capacity and mobilize the province's unique competitive strengths. | |
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| Performance Indicator R1 | Comparison of actual versus planned OMAFRA - U of G Research Program spending, in total, and in each of the research theme areas. | |
| | Metric R1 (a-i) | Annual actual dollars in the OMAFRA - U of G partnership research program spent on research versus planned, in total by research theme. |
| | Baseline: | Baseline is the allocation of project planned $ for 2008/09 by theme. |
| | Target: | Ratio of actual to planned dollars spent of **1:1.** |
| | Results (2013/14): | The table below outlines the total amount of research funds, by theme, committed to projects and the amount of funds available for the Fall 2013 Call. It shows the total committed to projects approved for 2013/14 ($2.9M), and the total budgeted ($3M), a ratio of 2.9:3.0 or **almost 1:1**. |

**Research Program Project Operating Funds**

| Research Themes | Total Committed to Projects (April 1/08 - April 30/13) | Total Committed to Projects Approved for 2013/14* | Budget for 2013/14 | Total Commitments for 6-Year Theme Budget | Overall 6-Year Theme Budget |
|---|---|---|---|---|---|
| Ag Policy & Rural Dev | 4,015,585 | 0 | 0 | 4,015,585 | 4,000,000 |
| Bioeconomy | 5,000,000 | 0 | 0 | 5,000,000 | 5,000,000 |
| Emergency Mgmt | 2,500,000 | 354,465 | 300,000 | 2,854,465 | 2,800,000 |
| Environmental Sust. | 4,983,648 | 0 | 0 | 4,983,648 | 5,000,000 |
| Food for Health | 4,979,436 | 486,557 | 700,000 | 5,465,993 | 5,700,000 |
| Product Development | 4,293,420 | 0 | 0 | 4,293,420 | 4,500,000 |
| Production Systems | 12,227,911 | 2,052,176 | 2,000,000 | 14,280,087 | 14,000,000 |
| Total | 38,000,000 | 2,893,198 | 3,000,000 | 40,893,198 | 41,000,000 |

* includes commitments to 2nd & 3rd year projects approved to start in fiscal 2014/15 & 2015/16

**Note**: In fall 2012, a call for research proposals was only issued for three research themes: Emergency Management, Food for Health and Production Systems. That is why the table above shows no funds committed for the remaining themes: Product Development, Environmental Sustainability, Bioeconomy and Ag Policy & Rural Development.

OMAFRA's New Direction Program Research Program was used to fund proposals for Ag Policy & Rural Devel, Bioeconomy and Environ Sustainability that year.

| | Metric R1 (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. |
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| | 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: | 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 (2013/14): | See table below, which indicates the number of research proposals submitted in each research theme area. |

**2013/2014 (Results from Call 2012 for projects to begin May 1, 2013)**

| Theme | Ag Policy & Rural Devel | Bioeconomy | Emerg Mgmt | Env Sust | Food | Prod Dev | Prod Syst I | Prod Syst II | Total |
|---|---|---|---|---|---|---|---|---|---|
| Number of active projects | 21 | 20 | 20 | 22 | 21 | 15 | 51 | 46 | 198 |
| Number of LOIs | 0 | 0 | 14 | 0 | 23 | 0 | 82 | N/A | 119* |
| Number of Proposals | 0 | 0 | 11 | 0 | 7 | 0 | 33 | 32 | 68* |
| Number of proposals funded | 0 | 0 | 8 | 0 | 6 | 0 | 25 | 31 | 55** |

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

** Some proposals were funded under more than one theme

**Note**: In fall 2012, a call for research proposals was only issued for three research themes: Emergency Management, Food for Health and Production Systems. That is why the table above shows no funds committed for the remaining themes: Product Development, Environmental Sustainability, Bioeconomy and Ag Policy & Rural Development.

OMAFRA's New Direction Program Research Program was used to fund proposals for Ag Policy & Rural Devel, Bioeconomy and Environ Sustainability that year.

**Total for the 5-year period 2008/09 to 2012/13**

| Theme | Ag Policy & Rural Devel | Bioeconomy | Emerg Mgmt | Env Sust | Food | Prod Dev | Prod Syst I | Prod Syst II | Total |
|---|---|---|---|---|---|---|---|---|---|
| Number of active projects | 102 | 70 | 68 | 116 | 93 | 68 | 222 | 302 | 1,041** |
| Number of LOIs* | 49 | 54 | 51 | 100 | 184 | 66 | 237 | N/A | 741* |
| Number of Proposals* | 64 | 38 | 48 | 79 | 61 | 54 | 176 | 122 | 642* |
| Number of proposals funded** | 40 | 26 | 42 | 45 | 36 | 25 | 94 | 118 | 426** |

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

** Some proposals were funded under more than one theme

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| Metric R1 (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: | Average for 2008/09 was 2.3:1 third party investment to Agreement research operating funding. |
| Target: | Leveraged dollars to OMAFRA research operating funding (in total, and by theme) to be **≥ 2008/09 baselines (2.3:1).** |

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| Results (2013/14): | The 2013/14 results fell slightly short of the target with a ratio of **2.1:1** third party investment to Agreement funding. The total amount of third party investment was $11.2 million. Total OMAFRA operating funds of $5,358,226 were committed to projects within fiscal 2013/14.<br>*Note: There has been a change in methodology for calculating the ratios, effective 2013/14 fiscal year, in that "Cash and In-kind Leveraged" through active research projects is divided by "Budget Allocated to Active OMAFRA-UofG Research Projects", (rather than 'Budgets committed to projects approved for the year', as used previously for the calculation).* |

| Funding leveraged in 2013/2014 per research theme | Ag Policy & Rural Devel | Bioeconomy | Emerg Mgmt | Env Sust | Food | Prod Dev | Prod Syst Tier I and II | **Total** |
|---|---|---|---|---|---|---|---|---|
| Cash and in-kind leveraged | 110,783 | 640,857 | 636,493 | 696,675 | 1,242,164 | 766,023 | 7,767,025 | **11,163,345** |
| Operating budget allocated to active projects | 405,340 | 404,506 | 565,710 | 538,691 | 722,433 | 555,860 | 2,165,686 | **5,358,226** |
| Ratio of 3rd party leveraging to allocated operating budgets | 0.3:1 | 1.6:1 | 1.1:1 | 1.3:1 | 1.7:1 | 1.4:1 | 3.6:1 | **2.1:1** |
| | | | | | | | | |
| Total 5-year leveraging from 2008/09 to 2012/13 per research theme | Ag Policy & Rural Devel | Bioeconomy | Emerg Mgmt | Env Sust | Food | Prod Dev | Prod Syst Tier I and II | Total |
| Cash and in-kind leveraged | 1,398,453 | 6,655,251 | 4,349,950 | 7,457,078 | 8,761,308 | 5,089,715 | 55,298,515 | 89,010,270 |
| Ratio of 3rd party leveraging to allocated operating budgets | 0.4:1 | 1.3:1 | 1.7:1 | 1.5:1 | 1.8:1 | 1.2:1 | 4.5:1 | 2.3:1 |

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| | Metric R1(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 of external research dollars relative to $51.4 million OMAFRA – U of G Agreement Research expenditures, or a ratio of 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: | Total external dollars leveraged is to be ≥ 2008/09 baseline of **$54.6 million**. |
| | Results (2013/14): | 2013/14 results: **$35.2 million** of external funds were leveraged from OMAFRA's $52.9M investment. See notes following the tables below for explanations. |

| Fiscal Year | Total U of G Research Funding (' 000s) (Note 1) | Total OMAFRA Partnership Research Funding ('000s) | Funding Leveraged from OMAFRA Agreement | | | | | Ratio |
|---|---|---|---|---|---|---|---|---|
| | | | Total Funding from All Sources (Est. ' 000s) | Breakdown by Source (Note 2) | | | | |
| | | | | Federal | OMAFRA | Other Provincial | Business / Industry / Private / Other | |
| **2013/2014** | *127,687* | *52,856* | *35,149* | *17,069* | *2,411* | *891* | *14,778* | ***(35.2:52.9) 0.7:1*** |
| 2012/2013 | *127,089* | *57,665* | *31,847* | *19,923* | *1,783* | *1,754* | *8,387* | *(31.9:57.7) 0.6:1* |
| 2011/2012 | *141,748* | *56,958* | *37,129* | *24,740* | *1,253* | *418* | *10,718* | *(37.1:57.0) 0.7:1* |
| 2010/2011 | *141,494* | *52,309* | *49,525* | *23,206* | *1,668* | *7,783* | *16,868* | *(49.5:52.3) 0.9:1* |
| 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 - U of G Agreement for projects (across all U of G Departments/researchers) which support the objectives of OMAFRA's research priorities. "Total U of G Research Funding" is the total of all research projects (including OMAFRA - U of G 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, Food Safety, etc.; "Other Provincial" includes funding from all other provincial ministries or agencies; and " business/industry/private/other " includes all other sources.

Explanation of Results: Total funding 'Leveraged from the OMAFRA Partnership' from all sources (including OMAFRA outside the Partnership and other provincial ministries, as well as federal, and business/industry/private/other sources) increased by ~$3.4M in 2013/14 compared to 2012/13. The leveraged funding from federal sources drops by almost $3M, but this was offset by an increase of ~$6.5M from business/Industry/Private and other sources of leveraged funding.

Total funding leveraged from the OMAFRA Partnership from all sources (including OMAFRA outside the Partnership and other Provincial Ministries) remains substantially below the 5-year average for the 2008/09 to 2012/13 period, with funding in 2013/14 from federal and other provincial sources being substantially lower than the 5-year average for these sources. It is encouraging to see leveraged funding from business/industry/private and other sources rebound to above the 5-year average for these sources, reversing the declining trend observed over the past several years.

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| | Metric R1 (d) | Number and list of active research projects funded, by program area. |
| | Baseline: | Number of active research projects established as per performance indicator 1(a-ii), above. |
| | Target: | Targets for number of projects funded in each area to be **≥ 2008/09 levels**. |
| | Results (2013/14): | In 2013/14, the total number of projects funded greatly exceeded that of 2008/09. |

| Number of Active Projects by Theme | **2013/14** | 2012/13 | 2011/12 | 2010/11 | 2009/10 | **2008/09** |
|---|---|---|---|---|---|---|
| Agricultural and Rural Policy: | 21 | 28 | 23 | 27 | 19 | 14* |
| Bioeconomy – Industrial Uses: | 20 | 23 | 22 | 17 | 10 | 5 |
| Emergency Management: | 20 | 29 | 22 | 16 | 12 | 2 |
| Environmental Sustainability: | 22 | 29 | 33 | 30 | 19 | 15 |
| Food for Health: | 21 | 30 | 27 | 24 | 10 | 9 |
| Product Development: | 15 | 25 | 18 | 16 | 10 | 5 |
| Production Systems Tier I: | 51 | 76 | 67 | 51 | 38 | 13 |
| Production Systems Tier II: | 62 | 70 | 75 | 77 | 51 | 43 |
| Total number of Active Projects: | **232** | 310***** | 287**** | 230*** | 160** | **92** |

* one project funded by Research Program Director discretionary fund

**9 projects are funded in more than one theme

*** 28 projects are funded in more than one theme

****26 projects are funded in more than one theme

*****32 projects are funded in more than one theme

Go to http://www.uoguelph.ca/omafra_partnership/research/en/researchresult/FundedProjects.asp for a complete listing of 2013/14 projects.

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| | Metric R1 (e) | Level of utilization of research stations. |
| | Baseline: | Established based on 2008/09 data.<br>Utilization to be reported in three ways: i) number of projects using each station, ii) percentage of utilization and iii) dollar value of research station usage |

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| Target: | Research station utilization to be **≥ 2008/09 levels.** |
| Results (2013/14): | See table below. |

| **Animal Research Stations** | | Number of OMAFRA - U of G Projects | | Percentage of Utilization- (Note #1) | | Value (in 1,000's of $) of Research Station Utilization (Note #5) | |
|---|---|---|---|---|---|---|---|
| | Units | 2013/14 | Average of 5 years (2009/10 - 2013/14) | 2013/14 | Average of 5 years (2009/10 - 2013/14) | 2013/14 | Average of 5 years (2009/10 - 2013/14) |
| Alma Aquaculture (see Note #2) | tanks | 8 | 6 | 29% | 23% | $ 488,120 | n/a |
| Arkell Poultry | animals | 9 | 10 | 65% | 63% | $605,540 | n/a |
| Arkell Swine | animals | 7 | 7 | 50% | 47% | $1,130,460 | n/a |
| Arkell Equine | animals | 6 | 7 | 103% | 101% | $390,800 | n/a |
| Elora / Ponsonby Dairy | animals | 6 | 7.2 | 46% | 64% | $1,189,200 | n/a |
| Elora Beef | animals | 1 | 1.9 | 67% | 95% | $1,024,180 | n/a |
| Ponsonby Sheep | animals | 1 | 2 | 61% | 101% | $253,000 | n/a |
| | | | | | | | |
| Ponsonby General Animal Facility (see Note #3) | animals | 4 | 5.8 | 82% | 97% | $286,600 | n/a |
| | | | | | | | |
| Alfred Dairy (Note #4) | animals | 2 | 2 | 27% | 42% | $104,400 | n/a |
| Kemptville Dairy (Note #4) | animals | 1 | 1 | 27% | 24% | $288,485 | n/a |
| New Liskeard Beef (Note #4) | animals | 2 | 2 | 36% | 32% | $396,860 | n/a |
| Ridgetown Swine | animals | Ridgetown swine facility was closed for use in January 2013 | | | | | |
| | | | | | | | |
| | | | | | | | |

| Crop Research Stations | Units | Number of OMAFRA - U of G Projects | | Percentage of Utilization (Note #1) | | $ value of Research Station for Active OMAFRA / UofG Projects | |
|---|---|---|---|---|---|---|---|
| | | 2013/14 | Average of 5 years (2009/10 - 2013/14) | 2013/14 | Average of 5 years (2009/10 - 2013/14) | 2013/14 | Average of 5 years (2009/10 - 2013/14) |
| Bradford (Muck Crops) | acres | 26 | 8.6 | 88% | 79% | $265,300 | n/a |
| Elora (Field Crops) | acres | 48 | 27.6 | 33% | 46% | $432,820 | n/a |
| Guelph (turf, agroforestry) | acres | 20 | 13.2 | 93% | 78% | $221,880 | n/a |
| Simcoe (horticultural crops) | acres | 16 | 12.8 | 41% | 42% | $603,500 | n/a |
| Vineland (horticultural crops) | acres | 5 | 4.36 | 32% | 30% | $988,800 | n/a |
| Woodstock (field Crops) | acres | 7 | 8 | 21% | 16% | $126,500 | n/a |
| | | | | | | | |
| Kemptville/Winchester (field crops) | acres | 54 | 13.6 | 77% | 55% | Note #6 | n/a |
| New Liskeard (field crops) | acres | 28 | 8.2 | 90% | 86% | $72,005 | n/a |
| Emo (field crops) | acres | 20 | 5.8 | 50% | 81% | $96,515 | n/a |
| Ridgetown | acres | 61 | 23.8 | 87% | 62% | $178,250 | n/a |
| Huron | acres | included with Ridgetown | | included with Ridgetown | | included with Ridgetown | |
| Cedar Springs | acres | included with Ridgetown | | included with Ridgetown | | included with Ridgetown | |

Explanatory Notes:

Note #1: "Percentage of Research Station Utilization":

**Livestock Research Stations** (Poultry, Swine. Equine, Beef, Sheep, Dairy),

For most of these stations, the methodology for calculating Research Station Utilization statistics was modified in 2013 / 2014 in order to produce data that presents a much more realistic snapshot of station utilization than was given by the methodology used in previous years (2008 - 2013).

Most of these are 'breeding' herds/flocks, where herd/flock replacement animals are generated within the herd/flock and grown to maturity. Also, many researchers tend to focus their research efforts on particular demographic segments of the overall herd/flock (i.e., calves; transition and

lactating cows; mature laying hens; weaner or grower pigs, etc.), and consequently, there are often large segments of the overall breeding herd/flock demographics that may see little or no use (but nevertheless these animals must be maintained, in order to generate the required replacement stock for the herd/flock).

The previously used calculation methodology expressed the '% station utilization' as the "total no. of research animal-days utilized in the year" divided by the "overall total number of animal-days available" in the year. In that scenario, use of, say, 90 animals on a research trial for a period of 50 days out of the year would be utilization of 4500 (=90x50) research animal days, out of an overall total days available of 32,850 (=90x365), or a 13.7% utilization rate (assuming none of the animals were utilized for another period within the same year).

As noted above, since researchers tend to heavily utilize certain demographic segments of a herd/flock, but other segments are often utilized relatively little, this previous methodology generally greatly underestimated the true utilization of the herds/flocks (i.e., utilized research demographics were greatly diluted by animals needed to be maintained for herd/flock replacement purposes).

In the modified method adopted for 2013 / 2014 (and to be used in future years), the utilization rate (for Arkell Poultry, Arkell Swine, Arkell Equine, Elora Beef, Ponsonby Sheep, and the Elora/Ponsonby, Alfred and Kemptville dairy herds) is now presented as "Average % of Animals in Use for Research" and is calculated as the "total no. of animals utilized for research at any point in time within the year" as a percentage of the "average number of animals in the herd/flock for that year".

This methodology provides a much better recognition of the fact that certain demographic segments of the herd/flocks are very heavily (perhaps 100%) utilized for varying (short or longer) portions of the year, but avoids the often very substantial 'diluting' effect of the often large portion of a year (i.e., large number of days) some of these animals may not be 'on-trial' and also from other demographic segments having no utilization for research during the year (i.e., necessary to be kept as herd/flock replacement animals).

Given the diversity of the livestock herd/flocks at the research stations, no single 'utilization rate' calculation can give a perfect picture of the true utilization of herd/flock animals for research. The modified methodology for calculating "% Research Station Utilization" was, as noted above, applied to Arkell Poultry, Arkell Swine, Arkell Equine, Elora Beef, Ponsonby Sheep, and the Elora/Ponsonby, Alfred and Kemptville dairy herds. This modified methodology was not utilized for calculating the "5 Station Utilization" for the Alma Aquaculture or the Ponsonby General Facility as detailed in the respective notes below.

**Crops Research Stations** (Bradford; Elora; Guelph; Simcoe; Vineland; Woodstock; Kemptville/Winchester; New Liskeard; Emo; Ridgetown),

The methodology used to calculate "% Research Station utilization" remains unchanged from previous years, calculated as "total acreage in research studies as a percentage of the total station acreage available for research studies in the year". Given that crops research typically requires a 3-year rotation cycle (one year in research trials followed by two years out of trials, to allow assessment of residual effects and preparing for optimized uniformity of land going into new trials) this would generally suggest utilization rates of ~33% if research land is 'fully utilized'. This can be affected, however, by rotations which can may be as short as 2 years or may need to be extended to 4 years depending on the nature of the research), and there are situations, such as the long-term cropping systems research plots at Elora and Ridgetown, where these are in-use as research trials every year (thus raising the average effective utilization rate for the station).

Note #2: Alma Aquaculture: There was no change made in how utilization rate was calculated for the Alma Aquaculture Research Station, as the previously used method (based on the number of tanks utilized for research relative to the total number of tanks available, rather than on the numbers of fish utilized and for how long) actually closely approximates the new methodology adopted for most of the other livestock stations.

Note #3: Ponsonby General Animal Facility (PGAF): There is no resident herd or flock in the Ponsonby General Animal facility. Rather, groups of animals are moved into the facility for a period of time, either for conducting specific research trials, or to hold animals in preparation for research trials. Animals are generally moved out of the General Facility soon after the research trials are completed. Consequently, the "% Station utilization" rate for this facility was retained as "total no. of research animal-days utilized in the year" divided by the "overall total number of animal-days available", since neither of the two 'dilution effects' (portions of demographics not utilized for research; year-round resident research animals only used for a portion of the year) are applicable to animals housed at PGAF.

Other Notes:

Note #4: Alfred, Kemptville and New Liskeard Livestock herds: Due to the nature of data records at these three locations, the multi-year averages for these locations were restricted to 3-years at Alfred Dairy and New Liskeard Beef, and 2 years at Kemptville Dairy.

Notes #5: "$ Value of Research Station Utilization": The methodology for reporting these values was altered for the 2013/2014 fiscal year. The values shown are the actual values for full operation of the specified station. (In previous years, comparable values would have been pro-rated by the "% research station utilization" values, which resulted in artificially low values for station utilization costs.) As a result of the new methodology, the 5-year average station costs have been omitted. (However, a fair assumption is that station operation costs in previous years closely approximated the values shown for 2013/2014.)

Notes #6: Research station operating costs for the Kemptville and Winchester crops research areas are not segregated out from the overall Kemptville research stations operations financial records.

| Key Outcome | A critical mass of world class faculty, technical staff and graduate students addressing OMAFRA critical challenges and opportunities. | |
|---|---|---|
| Performance Indicator R2 | Total faculty and research personnel employed by the University related to OMAFRA research themes, and the proportion funded through the OMAFRA - U of G Research Program. | |
| | Metric (a) | Total number of faculty full time equivalents (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: | Number of FTEs to be **≥ 2008/09 baseline of 128 Faculty Research FTEs** |
| | Results (2013/14): | **110 Faculty Research FTEs**<br>See notes below for explanation of results. |

| | 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 - U of G Partnership) |
| **2013/14 Total** | **222** | **98** | **514** |
| 2012/13 Total | 218 | 100 | 505 |
| 2011/12 Total: | 236 | 105 | 593 |
| 2010/11 Total: | 224 | 102 | 654 |
| 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 (DOE)" 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 Research Performance Indicator R#2 a) Total number of U of G Faculty FTEs and list of faculty and CARG researchers showing area of expertise related to Theme areas).

For 2013/14 it is estimated that the "Total number of Faculty FTEs showing expertise related to Theme areas" (i.e., engaged in research supportive of OMAFRA priorities) is approximately 195 'Research FTEs' (compared to ~200 in 2013/14 and an average of 220 over the 5-year period 2008/09 to 2012/13).

Compared to 2012/13 metrics, the number of researcher engaged in OMAFRA supportive research in 2013/14 increased slightly from 218 to 222, although the average portion of their research FTE decreased slightly from 92% to 88% (hovering close to the 5-yar ave. of 90%). These 195 'Research FTEs' would equate to approximately 97.5 full person FTEs of time devoted to research, if one were to assume, reasonably, that on average (across all U of G faculty) a 'research FTE' represents 0.5 of each faculty member's full FTE (see note above explaining 'Research FTE' and diversity across Colleges).

As in previous years, there was a broad diversity between departments, with 105 out of 122 researchers in OAC (86%) receiving funding in 2013/14 for research related to OMAFRA priorities (for 301 out of 363 or 83% of OAC research projects), whereas in the College of Social & Applied Human Sciences (CSAHS) only 7 out of 53 researchers (13%) received funding for research related to OMAFRA priorities (for169 out of 113 or 14% of CSAHS research projects) and in the College of Management and Economics (CME) only 8 out of 35 researchers (23%) received funding for research related to OMAFRA priorities (for 10 out of 52 or 19% of CME research projects). For added context, these 222 researchers across all U of G Colleges that received funding awards for research supportive of OMAFRA priorities represented 43% of all 521 researchers receiving awards for any research in 2013/2014.

Overall, there was a slight increase in the number of projects supportive of OMAFRA research priorities which received funding in 2013/14 (514 up from 505 in 2012/13) but still below the 593 OMAFRA-supportive projects in 2011/12). This trend mirrored the broader University trend wherein there was an increase in the overall number of projects that received research funding outside of the OMAFRA-U of G Partnership (1,138 in 2013/14 up from 1,091 in 2012/13 but below 1,253 in 2011/12).

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

| | Metric R2 (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: | Retain the number of faculty FTEs to the 2008/09 level **(65),** but may erode due to inflation & other financial pressures. |
| | Results (2013/14): | Number of faculty FTEs specifically allocated to OMAFRA Partnership research projects:<br>**Total: 66.04** plus an HQP Director at **0.20** (this is not included below). The 6.67 decrease in FTEs is a result of not including the Agricultural Policy & Rural Development, Bioeconomy, Environmental Sustainability and Product Development themes in the Call for LOIs/Full Proposals in Fall 2012. |

| Research Theme | **2013/14** | 2012/13 | 2011/12 | 2010/11 | 2009/10 | **2008/09** |
|---|---|---|---|---|---|---|
| Ag Policy & Rural Devel: | 5.00 | 6.69 | 5.98 | 4.31 | 3.31 | 2.10 |
| Bioeconomy – Industrial Uses: | 3.19 | 4.79 | 3.31 | 2.86 | 1.79 | 1.20 |
| Emergency Management: | 6.18 | 4.85 | 3.74 | 3.22 | 2.32 | 0.80 |
| Environmental Sustainability: | 5.76 | 8.82 | 9.57 | 9.37 | 5.20 | 5.10 |
| Food for Health: | 8.96 | 10.10 | 8.63 | 6.60 | 3.69 | 2.20 |
| Product Development: | 3.28 | 4.31 | 2.76 | 2.94 | 3.37 | 2.50 |
| Production Systems Tier I: | 21.12 | 19.98 | 19.09 | 17.87 | 22.81 | 25.20 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Production Systems Tier II: | 11.65 | 13.17 | 15.71 | 15.82 | 12.38 | 13.00 |
| | | Production Systems Tier III & IV | 0.90 | | | | | |
| | | Totals | **66.04** | 72.71 | 68.79 | 62.99 | 54.87 | **52.10** |
| | | | | | | | | |
| | Metric R2 (b-ii) | Total number of research personnel FTEs (i.e. post-doctoral students, graduate students, research associates), that are funded through the OMAFRA – U of G Partnership, in total and by research theme area. | | | | | | |
| | Baseline: | 2008/09: 113 research personnel (post-doctoral students, graduate students, research associates) funded through OMAFRA approved projects. | | | | | | |
| | Target: | Retain the number of research personnel FTEs to the 2008/09 level **(113)**, but may erode due to inflation & other financial pressures. | | | | | | |
| | Results (2013/14): | **Total number of research personnel FTEs**: **253.13**<br>Note: A 2013/14 change in the reporting template has provided a more thorough reporting of research personnel FTE's, thus providing a more accurate account of the FTE's. | | | | | | |
| | | By Research Theme | **2013/14** | 2012/13 | 2011/12 | 2010/11 | 2009/10 | **2008/09** |
| | | Ag Policy & Rural Devel: | 23.20 | 19.45 | 16.50 | 14.20 | 14.13 | 4.00 |
| | | Bioeconomy – Industrial Uses: | 11.20 | 15.35 | 14.25 | 15.46 | 5.00 | 0.09 |
| | | Emergency Management: | 18.79 | 27.17 | 23.75 | 23.06 | 7.50 | 1.90 |
| | | Environmental Sustainability: | 23.95 | 17.37 | 15.10 | 12.85 | 10.01 | 11.80 |
| | | Food for Health: | 45.52 | 40.61 | 34.80 | 23.46 | 15.85 | 5.14 |
| | | Product Development: | 13.77 | 23.32 | 20.21 | 13.21 | 7.38 | 0.29 |
| | | Production Systems Tier I: | 96.32 | 65.81 | 56.28 | 40.87 | 18.18 | 57.18 |
| | | Production Systems Tier II: | 20.38 | 34.83 | 34.91 | 30.77 | 42.70 | 32.44 |
| | | Totals | **253.13** | 243.91 | 215.80 | 173.88 | 120.75 | **112.84** |
| | | | | | | | | |

| | | |
|---|---|---|
| | Metric<br>R2 (b-iii) | Number of faculty, CARG researchers and research personnel FTEs that are funded through the OMAFRA - U of G Partnership in total and by research theme area. |
| | Baseline: | 2008/09: Established at 172 faculty and CARG researchers funded through the partnership in total. |
| | Target: | To retain the number of FTEs as close to the 2008/09 level **(172),** but may erode due to inflation & other financial pressures. |
| | Results (2013/14): | Total number of faculty, CARG & research personnel FTEs: **342.25**<br><br>Note: A 2013/14 change in the reporting template has provided a more thorough reporting of personnel FTE's, thus providing a more accurate account of the FTE's. |

| Total FTEs by Theme | **2013/14** | 2012/13 | 2011/12 | 2010/11 | 2009/10 | **2008/09** |
|---|---|---|---|---|---|---|
| Ag Policy & Rural Devel: | 28.20 | 22.80 | 20.78 | 18.86 | 20.89 | 6.24 |
| Bioeconomy | 14.94 | 20.14 | 18.93 | 19.04 | 7.69 | 2.10 |
| Emergency Management: | 23.88 | 32.12 | 25.58 | 26.61 | 9.82 | 2.65 |
| Environ Sustainability: | 34.65 | 25.34 | 25.42 | 24.61 | 19.59 | 19.59 |
| Food for Health: | 54.13 | 50.76 | 43.82 | 30.41 | 7.34 | 7.34 |
| Product Development: | 16.78 | 27.63 | 22.91 | 16.15 | 2.79 | 2.79 |
| Production Systems Tier I: | 118.98 | 87.27 | 77.15 | 60.87 | 84.74 | 84.74 |
| Production Systems Tier II: | 50.69 | 49.10 | 52.32 | 48.19 | 46.52 | 46.52 |
| Totals | **342.25** | 315.16 | 286.91 | 244.74 | 181.98 | **171.97** |

| 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 R3 (a) | Number of faculty/researchers/staff related to the research theme areas, recognized by their peers through research chairs, awards of recognition, appointment to prestigious positions (international panels) and leadership of national and international research initiatives |
| | Baseline: | In 2008/09, 25 U of G faculty members were Canada Research Chair holders, of which 10 had active OMAFRA research projects. Same as performance indicator OA1 (c). |
| | Target: | Recognition as indicated by awards, appointments etc. to be **≥** 2008/09 of **25** faculty members. |
| | Results (2013/14): | During 2013/14, **29** faculty members at the U of G were Canada Research Chair holders, of which 10 had active OMAFRA research projects. |
| | | |
| | Metric R3 (b) | U of G's position compared to other Canadian universities, and their ranking in the previous year in the comprehensive category as published annually by Research Money Inc. |
| | Baseline: | Research Money Inc.'s 2009 rankings put U of G in second place among Canadian 'comprehensive' universities. Same as metric OA1 (a). |
| | Target: | U of G's ranking to be **second or better** among comprehensive universities in Canada. |
| | Results (2013/14): | Research Money Inc.'s most current (2013) rankings put U of G in **second** place among Canadian 'comprehensive' universities. The 2014 results will be available October 2014 and will be reported in the 2014/15 Annual Report. |
| | | |
| | Metric R3 (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 - U of G research program directors. |
| | Target: | Number of faculty publishing in high impact journals to be **≥** 2008/09 baseline of **91**. |
| | Results | Total number of faculty published in high impact journals: **33** |

| | | |
|---|---|---|
| | (2013/14): | No explanation is available concerning the results in comparison to the targets. |

| **No. of Faculty by Theme** | **2013/14** | 2012/13 | 2011/12 | 2010/11 | 2009/10 | **2008/09** |
|---|---|---|---|---|---|---|
| Ag Policy & Rural Devel: | 5 | 8 | 8 | 3 | 2 | 3 |
| Bioeconomy – Industrial Uses: | 1 | 6 | 2 | 1 | 3 | 3 |
| Emergency Management: | 1 | 5 | 0 | 0 | 2 | 0 |
| Environmental Sustainability: | 2 | 4 | 12 | 8 | 5 | 5 |
| Food for Health: | 4 | 11 | 13 | 2 | 1 | 7 |
| Product Development: | 0 | 4 | 6 | 4 | 0 | 6 |
| Production Systems I & II: | 18 | 42 | 44 | 44 | 75 | 67 |
| **Totals** | **33** | 80 | 85 | 62 | 88 | **91** |

| | | |
|---|---|---|
| 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 R4 (a) | Report how composition of advisory committee is representative of stakeholders in each theme |
| | Baseline: | 2008/09 baseline for stakeholder representation is described in 'Theme Research Proposal Review'. |
| | Target: | Adequate representation of stakeholders on advisory committees, as achieved in 2008/09 |
| | Results (2013/14): | See table below that indicates representation of stakeholders in 2013/14, with representation from research/scientific, OMAFRA/other government, and user community/industry/non government. |

| Theme | Ag Policy & Rural Devel | | 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 | 4 | 4 | 4 | 2 | 5 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 3 | 2 |
| OMAFRA / Gov't | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 2 | 2 | 3 | 3 | 3 | 4 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| User Community / Industry / Non-Gov't | 5 | 3 | 3 | 3 | 2 | 1 | 3 | 2 | 2 | 2 | 4 | 4 | 3 | 5 | 3 | 3 |
| Total | 14 | 12 | 12 | 9 | 12 | 9 | 10 | 9 | 9 | 9 | 9 | 9 | 10 | 12 | 9 | 9 |

LOI – Letters of Intent
FP – Full Proposals

| | | |
|---|---|---|
| | Metric R4 (b) | Total number of publications in peer reviewed journals and % of those appearing in high impact journals (as identified by U of G Research Program Directors). |
| | Baseline: | 2008/09 baseline of 265 publications, 57% of which were in 'high impact' journals. |
| | Target: | Number of publications and % in high impact journals to be **≥** 2008/09 baseline of **265** and **57%** respectively. |
| | Results (2013/14): | Total number published in peer reviewed journals: **112;** total percentage in high impact journals: **30%.**<br>No explanation is available concerning these results in comparison to the target. |

**Total number of publications in peer reviewed journals (by theme), & ratio in high impact journals**

| **Research Theme** | **2013/14** | 2012/13 | 2011/12 | 2010/11 | 2009/10 | **2008/09** |
|---|---|---|---|---|---|---|
| Ag Policy & Rural Devel: | 5 – 100% | 8 - 88 % | 5 - 63% | 3 - 100% | 3 - 66% | 8 - 50% |
| Bioeconomy – Industrial Uses: | 7 – 14% | 26 - 35% | 23 - 9% | 6 - 17% | 3 - 66% | 8 -75% |
| Emergency Management: | 8 – 13% | 10 - 50% | 3 - 0% | 0 - 0% | 2 - 50% | 0 - 0% |
| Environmental Sustainability: | 4 – 50% | 16- 25% | 19 - 63% | 8 - 100% | 9 - 89% | 6 -67% |
| Food for Health: | 17 – 24% | 20 - 65% | 17 - 76% | 7 - 29% | 5 - 20% | 17 -35% |
| Product Development: | 2 – 0% | 7 - 71% | 13 - 46% | 10 - 40% | 14 - 0% | 10 -10% |
| Production Systems I & II: | 69 – 26% | 90 - 57% | 82 - 54% | 62 - 71% | 144 - 59% | 216 -58% |
| **Totals** | **112 – 30%** | 177 - 56% | 162 – 52% | 96 - 65% | 180 - 49% | **265 -57%** |

| | | |
|---|---|---|
| | | |
| | Metric R4 (c) | Number of collaborations and/or partnerships with external institutions. |

| | | |
|---|---|---|
| | Baseline: | Number of collaborators in 2008/09 (265) will be the baseline. |
| | Target: | Number and significance of collaborations and/or partnerships targeted to be **≥** 2008/09 baseline of **265**. |
| | Results (2013/14): | i) Total number of collaborators for continuing projects in 2013/14: **476**<br>ii) Total number of collaborators for new projects approved for 2013/14: **53***<br>(** Fall 2012 call for research proposals only in Emergency Management, Food for Health and Production Systems themes)*<br><br>Research Theme — # of Collaborators by Theme Continuing Projects in 2013/14 — # of Collaborators by Theme* New Projects for 2013/14<br>Ag Policy & Rural Devel: 37 (includes 11 OMAFRA staff) — 0 (includes 0 OMAFRA staff)<br>Bioeconomy – Industrial Uses: 79 (includes 16 OMAFRA staff — 0 (includes 0 OMAFRA staff)<br>Emergency Management: 33 (includes 19 OMAFRA staff) — 8 (includes 3 OMAFRA staff)<br>Environmental Sustainability: 65 (includes 21 OMAFRA staff — 0 (includes 0 OMAFRA staff)<br>Food for Health: 71 (includes 8 OMAFRA staff) — 6 (includes 3 OMAFRA staff)<br>Product Development: 42 (includes 2 OMAFRA staff) — 0 (includes 0 OMAFRA staff)<br>Production Systems I & II: 149 (includes 50 OMAFRA staff) — 39 (includes 21 OMAFRA staff) |
| | Results (2012/13) | i) Total number of collaborators for continuing projects in 2012/13: 326<br>ii) Total number of collaborators for new projects approved for 2012/13: 146 |
| | Results (2011/12) | i) Total number of collaborators for continuing projects in 2011/12: 345<br>ii) Total number of collaborators for new projects approved for 2011/12: 124 |
| | Results (2010/11) | i) Total number of collaborators for continuing projects in 2010/11: 168<br>ii) Total number of collaborators for new projects approved for 2010/11: 269 |
| | Results (2009/10) | i) Total number of collaborators for continuing projects in 2009/10: 203<br>ii) Total number of collaborators for new projects approved for 2009/10:167 |
| | Results (2008/09) | i) Total number of collaborators for continuing projects in **2008/09: 230**<br>ii) Total number of collaborators for new projects approved for **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. |
| | Results (2013/14): | The benefits to the economy, environment and health and well-being of Ontarions, generated from the Research Program are described in case studies presented in the 2014 Agri-Food Yearbook. |
| | | |
| Key Outcome | Highly skilled U of G graduates meet changing workforce demands | |
| Performance Indicator R6 | Level of engagement of University graduate students in OMAFRA - U of G research projects. | |
| | Metric R6 (a) | Total number of graduate students working on research projects related to each Agreement theme areas |
| | Baseline: | 140 grad students in 2008/09. |
| | Target: | Number of grad students to be maintained at 2008/09 level **(112),** but may decline due to inflation. |
| | Results (2013/14): | |

| **Graduate Students by Research Theme** | **2013/14** | 2012/13 | 2011/12 | 2010/11 | 2009/10 | **2008/09** |
|---|---|---|---|---|---|---|
| Agricultural and Rural Policy: | 19.05 | 19.10 | 15.00 | 12.60 | 21.00 | 4.00 |
| Bioeconomy – Industrial Uses: | 9.30 | 12.90 | 7.50 | 8.45 | 0.50 | 5.00 |
| Emergency Management: | 15.68 | 12.41 | 15.80 | 9.00 | 5.00 | 3.00 |
| Environmental Sustainability: | 21.24 | 17.27 | 19.55 | 11.05 | 4.50 | 8.00 |
| Food for Health: | 35.80 | 29.96 | 22.85 | 15.87 | 8.00 | 4.00 |
| Product Development: | 13.00 | 20.95 | 14.25 | 9.50 | 5.00 | 4.00 |
| Production Systems Tier I & II: | 94.49 | 80.38 | 65.40 | 51.20 | 57.00 | 112.00 |
| Totals | **208.56** | 192.97 | 160.35 | 117.67 | 101.00 | **140.00** |

| | | |
|---|---|---|
| | Metric R6 (b) | Total number of graduate students enrolled in the Highly Qualified Personnel (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 (2013/14): | **33** graduate students were enrolled in the HQP program during 2013/14. This number was comprised of : 0 students from the first year (2009/10), 6 from the second year (2010/11), 4 from the third year (2011/12), 12 from the fourth year (2012/13) and 11 in the fifth year (2013/14) of the HQP program. |
| | | |
| | Metric R6 (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 | In 2012-13 (the baseline year), 31 HQP students graduated, of which **95%** were estimated to be employed in sectors or fields related to their research areas of study. |
| | Results (2013/14): | The estimate of the percentage of HQP graduates working in their field has not changed. Examples of HQP graduates now working in their areas of study are shown in the 2014 Agri-Food Yearbook. |

| 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 R7 (a) | Total number of knowledge transfer events related to new practices and technologies in each theme area. |
| | Baseline: | See table below for 2008/09 baseline of knowledge transfer events. Note: 2008/09 results have been incorporated into average for past five years. |
| | Target: | Number of knowledge transfer events ≥ 2008/09 baseline. Note: 2008/09 results have been incorporated into average for past five years. |
| | Results (2013/14): | The table below shows knowledge transfer events for 2013/14 in each research theme area, compared to average of past five years. |

**Knowledge Transfer Events by Research Theme**

| | Ag Policy & Rural Devel | | Bioeconomy | | Emerg Mgmt | | Env Sust | | Food & Health | | Prod Dev | | Prod Syst Tiers I & II | | Total | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2013 /14 | Avg of past 5 years | 2013/ 14 | Avg of past 5 years | 2013/ 14 | Avg of past 5 years | 2013/ 14 | Avg of past 5 years | 2013 /14 | Avg of past 5 years | 2013/ 14 | Avg of past 5 years | 2013/ 14 | Avg of past 5 years | **2013/14** | **Avg of past 5 years** |
| Peer-reviewed journal publications | 5 | 6.80 | 7 | 10.40 | 8 | 2.80 | 4 | 10.60 | 17 | 11.40 | 2 | 12.00 | 69 | 119.60 | **112** | **173.60** |
| Presentations at scientific conferences, | 12 | 18.20 | 14 | 18.00 | 34 | 9.40 | 17 | 23.40 | 20 | 14.00 | 5 | 9.20 | 114 | 132.80 | **216** | **223.80** |
| Articles published in the public press | 14 | 18.00 | 3 | 17.40 | 10 | 9.40 | 1 | 10.60 | 7 | 5.20 | 1 | 3.00 | 81 | 113.40 | **117** | **177.00** |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| New presentations posted on the internet | 1 | 7.60 | 0 | 13.00 | 3 | 3.60 | 0 | 13.80 | 2 | 7.40 | 0 | 5.80 | 22 | 34.00 | **28** | 85.20 |
| Presentations to stakeholder or industry | 26 | 30.40 | 7 | 24.80 | 23 | 14.20 | 27 | 40.40 | 21 | 23.80 | 11 | 10.80 | 164 | 187.60 | **279** | 332.00 |
| | | | | | | | | | | | | | | | | |

| | | |
|---|---|---|
| | Metric R7 (b) | Examples of utilization of new knowledge by stakeholders |
| | Baseline: | Anecdotal reports of utilization of new knowledge by stakeholders |
| | Target: | Annual reports of utilization of new knowledge by stakeholders |
| | Results (2013/14): | Examples in 2013/14 included:<br>• Prof. Lefa Teng of Uof G's College of Economics & Management who is working with Pillitteri Estates Winery and other Ontario wineries to develop champagne-style icewine to match Chinese taste preferences, further expanding Ontario's icewine market where it enjoys a reputation of the highest quality.<br>Read more examples of stakeholder utilization of new knowledge in the 2014 Agri-Food Yearbook. |
| | | |
| | Metric R7 (c) | Total number of licenses and patents and those applied for. Same metric as R8 (b) & (c). |
| | Baseline: | 9 patents filed in 2008/09<br>17 licenses granted in 2008/09 |
| | Target: | No. of patent applications **≥** 2008/09, which was **9**<br>No. of licenses granted **≥** 2008/09, which was **17** |
| | Results (2013/14): | Total number of OMAFRA related patents applications: 16 |

| Patents filed by theme: | **2013/14** | 2012/13 | 2011/12 | 2010/11 | 2009/10 | **2008/09** |
|---|---|---|---|---|---|---|
| Ag Policy & Rural Development: | 0 | 0 | 0 | 0 | 0 | 0 |
| Bioeconomy – Industrial Uses: | 3 | 3 | 3 | 4 | 5 | 0 |
| Emergency Management: | 0 | 0 | 0 | 0 | 0 | 0 |
| Environmental Sustainability: | 0 | 0 | 0 | 0 | 0 | 0 |
| Food for Health: | 0 | 0 | 1 | 2 | 1 | 0 |
| Product Development: | 11 | 7 | 3 | 1 | 0 | 2 |
| Production Systems (Animals): | 1 | 0 | 1 | 4 | 3 | 7 |
| Production Systems (Crops): | 1 | 3 | 0 | 4 | 1 | 0 |
| Totals: | **16** | 13 | 8 | 15 | 10 | **9** |

Note: Fluctuation in the number of patent applications is common. Applications are only made for technologies

that have been evaluated to have strong patentability. On average most years, the CC has outperformed the baseline of 9 applications.

Total number of OMAFRA related licenses granted: **49**

| **License & amending agreements by research theme**: | **2013/14** | 2012/13 | 2011/12 | 2010/11 | 2009/10 | **2008/09** |
|---|---|---|---|---|---|---|
| Ag Policy & Rural Development: | **0** | 0 | 0 | 0 | 0 | **0** |
| Bioeconomy – Industrial Uses: | **3** | 2 | 3 | 0 | 1 | **0** |
| Emergency Management: | **0** | 0 | 0 | 0 | 0 | **0** |
| Environmental Sustainability: | **0** | 0 | 0 | 0 | 0 | **0** |
| Food for Health: | **0** | 0 | 1 | 0 | 0 | **0** |
| Product Development: | **1** | 4 | 0 | 1 | 1 | **0** |
| Production Systems (Animals): | **0** | 2 | 2 | 1 | 1 | **0** |
| Production Systems (Crops): | 45 | 6 | 27 | 13 | 18 | 16 |
| Totals: | **49** | 14 | 32 | 15 | 20 | **17** |

Note: There were considerably more germplasm licenses granted this year due to the recent decision to include Amending Agreements

Metric R7 (d)

Ratio of third-party investment leveraged by OMAFRA research funding, in each theme area.
Same metric as R1 (b), but this PI identifies the leveraging by research theme.

Baseline:

Third-party investment in 2008/09, the baseline year by each theme area (shown below):

| 2008/09 Theme | Ag Policy & Rural Devel | Bio-economy | Emergency Mgmt | Env Sust | Food | Prod Dev | Prod Syst Tiers I and II |
|---|---|---|---|---|---|---|---|
| Cash and in-kind leveraged | 283,900 | 323,626 | 500 | 1,037,475 | 782,324 | 734,324 | 5,990,994 |
| Ratio of 3rd party leveraging to allocated operating budgets | 1:1 | 0.7:1 | 0.1:1 | 1.8:1 | 2.2:1 | 1.1:1 | 4.1:1 |

Target:

Ratio of third-party investment leveraged by OMAFRA research funding, by each theme area, **≥ 2008/09**

| | | |
|---|---|---|
| | Results (2013/14): | **The 2013/14 ratio of third party investment to Agreement funding was 2.1:1**. Total amount of third party investment - $11.2m.<br>Ratio is based on total OMAFRA operating funds of $5,358,226 committed to projects within fiscal 2013/14.<br>(*Note: There has been a change in methodology for calculating the ratios, effective 2013/14 fiscal year, in that "Cash and In-kind Leveraged" through active research projects is divided by "Budget Allocated to Active [OMAFRA-UofG Research] Projects" (rather than 'Budgets committed to projects approved for the year', as used previously for the calculation.)* |

| **Funding leveraged in 2013/2014 per research theme** | Ag Policy & Rural Devel | Bio-economy | Emerg Mgmt | Env Sust | Food | Prod Dev | Prod Syst I and II |
|---|---|---|---|---|---|---|---|
| Cash and in-kind leveraged | 110,783 | 640,857 | 636,493 | 696,675 | 1,242,164 | 766,023 | 7,767,025 |
| Budget Allocated to active projects | 405,340 | 404,506 | 565,710 | 538,691 | 722,433 | 555,860 | 2,165,686 |
| Ratio of 3rd party leveraging to OMAFRA operating $ | 0.3:1 | 1.6:1 | 1.1:1 | 1.3:1 | 1.7:1 | 1.4:1 | 3.6:1 |
| | | | | | | | |
| **Total 5-year leveraging from 2008/09 to 2012/13 by theme** | Ag Policy & Rural Devel | Bio-economy | Emerg Mgmt | Env Sust | Food | Prod Dev | Prod Syst I and II |
| Cash and in-kind leveraged | 1,398,453 | 6,655,251 | 4,349,950 | 7,457,078 | 8,761,308 | 5,089,715 | 55,298,515 |
| Ratio of 3rd party leveraging to OMAFRA operating $ | 0.4:1 | 1.3:1 | 1.7:1 | 1.5:1 | 1.8:1 | 1.2:1 | 4.5:1 |

| Key Outcome | Research results commercialized | |
|---|---|---|
| Performance Indicator R8 | Patents, products (technologies, software, germplasm, registered trademarks, copyright), licenses granted to existing or start-up companies, existing businesses spun out and community-based service businesses created, and the economic impact.<br>R8 is also a performance indicator for the Joint Intellectual Property Committee of the Partnership. | |
| | Metric R8 (a) | Number of disclosures and technology assessments, by research theme |
| | Baseline: | 364 total disclosures and technology assessments in 2008/09 |
| | Target: | Number of disclosures and technology assessments **≥** 2008/09 baseline of **364**. |
| | Results (2013/14): | Total number of OMAFRA related disclosures: **167** |

| Disclosures by theme: | **2013/14** | 2012/13 | 2011/12 | 2010/11 | 2009/10 | **2008/09** |
|---|---|---|---|---|---|---|
| Ag Policy & Rural Devel: | 0 | 0 | 0 | 0 | 0 | 0 |
| Bioeconomy – Industrial Uses | 3 | 2 | 3 | 3 | 1 | 0 |
| Emergency Management | 0 | 0 | 0 | 0 | 0 | 0 |
| Environmental Sustainability: | 0 | 0 | 0 | 0 | 1 | 0 |
| Food for Health: | 0 | 0 | 1 | 0 | 2 | 0 |
| Product Development: | 6 | 6 | 5 | 2 | 1 | 2 |
| Production Systems (Animals): | 3 | 1 | 1 | 4 | 16 | 3 |
| Production Systems (Crops): | 155 | 258 | 68 | 151 | 100 | 359 |
| Totals: | **167** | 267 | 78 | 160 | 121 | **364** |

Note: Fluctuation in disclosure numbers is due primarily to fluctuation in the number of seed varieties that have been disclosed in a particular year. For example, in the 2008/09 fiscal year, there was an inordinately large disclosure of 176 tomato varieties.

A similar event also occurred in 2012/13, with the disclosure of 100 grape varieties, however the total disclosures fall short of the 2008/09 numbers. Despite fewer disclosures in recent years, royalty revenues have continued to increase on an annual basis.

| | | |
|---|---|---|
| | Metric R8 (b) | Number of patent applications filed, by research theme |
| | Baseline: | 9 patents filed in 2008/09 |
| | Target: | 2010-13: Number of patent applications to be **≥** 2008/09 baseline of **9**. |
| | Results (2013/14): | Total number of OMAFRA related patents filed: **16** |

| Patents filed by research theme: | **2013/14** | 2012/13 | 2011/12 | 2010/11 | 2009/10 | **2008/09** |
|---|---|---|---|---|---|---|
| Ag Policy & Rural Development: | 0 | 0 | 0 | 0 | 0 | 0 |
| Bioeconomy – Industrial Uses: | 3 | 3 | 3 | 4 | 5 | 0 |
| Emergency Management: | 0 | 0 | 0 | 0 | 0 | 0 |
| Environmental Sustainability: | 0 | 0 | 0 | 0 | 0 | 0 |
| Food for Health: | 0 | 0 | 1 | 2 | 1 | 0 |
| Product Development: | 11 | 7 | 3 | 1 | 0 | 2 |
| Production Systems (Animals): | 1 | 0 | 1 | 4 | 3 | 7 |
| Production Systems (Crops): | 1 | 3 | 0 | 4 | 1 | 0 |
| Totals: | **16** | 13 | 8 | 15 | 10 | **9** |

Note: Fluctuation in the number of patent applications is common. Applications are only made for technologies that have been evaluated to have strong patentability. On average most years, the CC has outperformed the baseline of 9 applications.

| | | |
|---|---|---|
| | Metric R8 (c) | Number of licenses granted by theme |
| | Baseline: | 17 licenses granted in 2008/09 |
| | Target: | Number of licenses granted to be **≥** 2008/09 baseline of **17**. |

| | | |
|---|---|---|
| | Results (2013/14): | Total number of OMAFRA related licenses granted: **49** |

License & amending agreements by research theme:

| | **2013/14** | 2012/13 | 2011/12 | 2010/11 | 2009/10 | **2008/09** |
|---|---|---|---|---|---|---|
| Ag Policy & Rural Development: | 0 | 0 | 0 | 0 | 0 | 0 |
| Bioeconomy – Industrial Uses: | 3 | 2 | 3 | 0 | 1 | 0 |
| Emergency Management: | 0 | 0 | 0 | 0 | 0 | 0 |
| Environmental Sustainability: | 0 | 0 | 0 | 0 | 0 | 0 |
| Food for Health: | 0 | 0 | 1 | 0 | 0 | 0 |
| Product Development: | 1 | 4 | 0 | 1 | 1 | 0 |
| Production Systems (Animals): | 0 | 2 | 2 | 1 | 1 | 0 |
| Production Systems (Crops): | 45 | 6 | 27 | 13 | 18 | 16 |
| Totals: | **49** | 14 | 32 | 15 | 20 | **17** |

Note: There were considerably more germplasm licenses granted in 2013/14 than in the previous year due to the recent decision to include amending agreements.

| | | |
|---|---|---|
| | Metric R8 (d) | Number of patents issued |
| | Baseline: | Five patents issued, as per 2008/09 |
| | Target: | Number of patents issued to be **≥** 2008/09 baseline of **5.** |
| | Results (2013/14): | Total number of OMAFRA related patents issued: **3** |

| Patents issued by research theme: | **2013/14** | 2012/13 | 2011/12 | 2010/11 | 2009/10 | **2008/09** |
|---|---|---|---|---|---|---|
| Ag Policy & Rural Development: | 0 | 0 | 0 | 0 | 0 | 0 |
| Bioeconomy – Industrial Uses: | 0 | 0 | 0 | 0 | 0 | 1 |
| Emergency Management: | 0 | 0 | 0 | 0 | 0 | 0 |
| Environmental Sustainability: | 0 | 0 | 0 | 0 | 0 | 0 |
| Food for Health: | 2 | 0 | 0 | 0 | 0 | 0 |
| Product Development: | 1 | 0 | 0 | 1 | 0 | 0 |
| Production Systems (Animals): | 0 | 0 | 0 | 2 | 0 | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Production Systems (Crops): | 0 | 1 | 0 | 0 | 0 | 4 |
| Totals: | **3** | 1 | 0 | 3 | 0 | **5** |

Note: Patents are evaluated and issued by the Patent Office. The U of G's Catalyst Centre does not have control over the schedule of evaluations/issuances by CIPO or USPTO, or other patent offices around the world. The CC has a healthy pipeline of patent applications which are managed by the Technology Transfer team, and will eventually lead to issued patents.

| | |
|---|---|
| Metric R8 (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: | Total dollar value to be ≥ 2008/09 baseline of **$1.3 million.** |
| Results (2013/14): | Total dollar value of revenue generated from licenses associated with OMAFRA-supported research: **$1.3 million** |

Revenue from OMAFRA-supported non-seed research from fiscal year end April 30, 2014:

Revenue from OMAFRA-supported seed research fiscal year-end March 31, 2014:

| License revenue generated | **2013/14** | 2012/13 | 2011/12 | 2010/11 | 2009/10 | **2008/09** |
|---|---|---|---|---|---|---|
| Non-seed research | $417,038 | $494,156 | $666,490 | $893,551 | $590,258 | $778,731 |
| Seed research | $922,625 | $884,120 | $789,445 | $699,280 | $610,221 | $561,851 |
| TOTAL: | **$1,339,664** | $1,378,276 | $1,455,935 | $1,592,832 | $1,200,480 | **$1,340,583** |

*Note: Non-seed research revenues decreased slightly in 2013/14 due to a number of technologies which have recently come off patent. As new technology deals are negotiated this number is expected to remain steady and grow in coming years.

Revenue from seed-based technologies has increased 4% over the 2012/13. This reflects the growing portfolio of seed varieties that have gained market traction and continue to see increased sales for both seeds and crop.

| | |
|---|---|
| Metric R8 (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 | Three case studies presented annually. |
| | Results (2013/14): | Examples of research projects advancing commercialization in 2013/14 include:<br>• Bridgestone Tires and other partners are supporting Prof. Dave Wolyn, Dept. of Plant Agriculture in developing a program for industrial-scale production of Russian dandelion, a potential replacement source pf natural rubber.<br>• Dairy Farmers of Ontario and other partners are supporting Prof. Claudia Wagner-Riddle, School of Environmental Sciences to identify manure application and storage methods that reduce production of methane, a significant greenhouse gas.<br>• Researchers at Vineland Research & Innovation Centre are breeding new varieties of apples and tender fruits that better thrive in Ontario's current climate and meet consumers' exacting preferences.<br><br>Read about these case studies and many more in the 2014 Agri-Food Yearbook. |
| 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.<br>Similar to metric OA6. | |
| | Metric | This outcome would also be assessed by the Expert Review of each theme area schedule at the end of five years. |
| | Baseline: | This performance indicator will be addressed through an assessment similar to the 'U of G / OMAFRA Impact Study' (Deloitte, 2007), to be conducted in 2012/13. An assessment was completed in 2012. |
| | Target: | A 2012/13 expert review of awareness of research outcomes and impacts among decision makers. |
| | Results (2013/14) | This PI was addressed in a 2012/13 study undertaken as part of the year five review of the Partnership Agreement (Stoddard, Sept 2012).<br>The study findings were very positive and are detailed in OA6 of the 2012/13 Annual Report.<br>In 2013/14, stakeholder awareness of research outcomes continues to be a priority. The Agreement's many 'knowledge translation and transfer' activities mobilize research knowledge directly to stakeholders, tailored to their sector's needs. |
| Key Outcome | Awareness of research outcomes and impacts among decision makers, staff and stakeholders | |
| Performance | Media citations related to research in OMAFRA research theme areas. | |

| Indicator R10 | | |
|---|---|---|
| | Metric (a) | Total number of media citations |
| | Baseline: | A total of 190 media citations were identified by researchers in their 2009 U of G annual and final reports. Additionally, 135 media articles were picked up by clipping services. This 2008/09 baseline is likely a significant underestimate of media pick-up but it represents the best available measure. |
| | Target: | Number of media citations to be **≥** 2008/09 baseline of **190.** |
| | Results (2013/14) | From researchers' 2013/14 annual and final research reports, number of media citations:<br><br>Ag Policy & Rural Devel: 14<br>Bioeconomy – Industrial Uses: 3<br>Emergency Management: 10<br>Environmental Sustainability: 1<br>Food for Health: 7<br>Product Development: 1<br>Production Systems I & II: 81<br><br>These media citations were identified by researchers in their 2013/14 U of G annual and final reports. This count is again, likely a significant underestimate of media pick-up. |

# 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

- Continued high success rates continue for OVC graduates on North American licensing exams
- Continued very high employer satisfaction rates with recent graduates

- Full accreditation from American and Canadian veterinary medical associations (AVMA / CVMA) continued

- Curricular enhancements made to the final year Rural Community Practice and Food Animal streams, for implementation in the 2014-15 academic year.

- The Centre for Public Health and Zoonoses hosted the 2013 annual international *Rabies in the Americas* conference, the longest running and largest conference specific to rabies in the world.

Targets achieved for all five VCEP Performance Indicators

## 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 five PIs in the Agreement.

| Key Outcome | Maintain American Veterinary Medical Association / Canadian Veterinary Medical Association 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: | Maintain AVMA/CVMA Accreditation |
| | Results (2013/14): | On March 26, 2014, OVC was granted a continuation of its full accreditation based on a vote by the AVMA/CVMA Council on Education. These two organizations represent the highest standard of achievement for veterinary medical education in the world.<br>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.<br><br>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. The Council expressed concerns and is requiring further information regarding the following areas;<br>*-"… budget and personnel reductions are not adversely affecting the educational quality of the DVM program"*<br>*-"… the status of funding for construction of a replacement Specialty Hospital for Companion Animals"* |

| | | |
|---|---|---|
| | | *-"… adequacy of clinical case numbers, especially in small animal and horses, to ensure that curricular objectives are being met"*<br>*- "…the impact of the increased class size on the clinical program and student learning".*<br>*- "…impact of faculty loss/recruitment on delivery of the professional curriculum".* |

| Key Outcome | Attracts and retains highly qualified clinical faculty from around the world as a source of new knowledge. | |
|---|---|---|
| Performance Indicator VCEP2 | An appropriate number of high quality faculty. | |
| | Metric | Number of faculty provided by U of G OMAFRA Agreement funding |
| | Baseline: | Baseline established as the number of faculty positions supported through the Agreement in 2009/10, at 12.4 faculty FTEs. |
| | Target: | Maintain 2008 level (baseline level likely to decline due to flatlined budget) of faculty at **12.4.** |
| | Results (2013/14): | VCEP funding of $1.9M contributed to the support of **11** faculty, which is 9.5% of the total OVC 115 faculty FTE . |
| | | |

| Key Outcome | Provide a comprehensive training program for undergraduate veterinary students. | |
|---|---|---|
| Performance Indicator VCEP3 | Readiness of graduates for employment<br>(Provide a comprehensive training program for undergraduate veterinary students) | |
| | Metric | Percentage 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: | Maintain percentages from 2007/08 annual student and employer surveys<br>2007/08 Results:<br>Of **graduates** who responded, **97%** were satisfied<br>Of the **employers** who responded **95%** were satisfied |
| | Results (2013/14): | The 2013/14 percentages indicating student and employer satisfaction were higher than the baseline. Specifically:<br><br>Of **graduates** who responded (n = 81), **99%** 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.<br>Of the **employers** who responded (n = 54), **100%** were satisfied (i.e. rated the new graduate as Superior, Very Good, or Good) with their employee's overall performance/competence to do the job for which they were hired.<br><br><u>2012/13 Results:</u><br>Of graduates who responded 98% were satisfied<br>Of the employers who responded 100% were satisfied<br><u>2011/12 Results:</u><br>Of graduates who responded 100% were satisfied<br>Of the employers who responded 96% were satisfied<br><u>2010/11 Results:</u><br>Of graduates who responded 100% were satisfied<br>Of the employers who responded 95% were satisfied |

| | | |
|---|---|---|
| | | <u>2009/10 Results:</u><br>Of graduates who responded 98% were satisfied<br>Of the employers who responded 92% were satisfied<br>**<u>2007/08 Results:</u>**<br>Of graduates who responded, **97% were satisfied**<br>Of the employers who responded **95% were satisfied** |
| | | |
| 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 | Percentage of VCEP students who pass the North American Veterinary Licensing Exam (NAVLE), compared to the percentage average of other North American institutions. |
| | Baseline: | Baseline is the 2008/09 pass rate for NAVLE students. |
| | Target: | That OVC students continue to meet or exceed the mean pass rate for all students writing the NAVLE exam, which was **97%** in the baseline year. |
| | Results (2013/14): | |

| | Dec 2013 & Apr 2014 | | Dec 2008 & Apr 2009 | |
|---|---|---|---|---|
| | OVC | ALL | OVC | All |
| Number Taking Exam | 122 | 3942 | 106 | 3009 |
| Number Passing | 118 | 3729 | 104 | 2908 |
| Percent Passing | **97** | **95** | **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: | Maintain funding for **15.1** DVSc students working in areas of priority to OMAFRA. |
| | Results (2013/14): | **15.1** DVSc students were funded under the OMAFRA-UofG Agreement |

# SCHEDULE G: BUSINESS CONTINUITY, EMERGENCY RESPONSE AND SURGE CAPACITY PLANNING

"After the Year 5 review, the Parties shall develop further milestones for the balance of the term of the Agreement." *(Article 5.3, OMAFRA-U of G Agreement)*

## Agriculture and Food Laboratory

During the 2013/14 fiscal year, AFL maintained the 'Emergency Surge Capacity' process. Additional yearly milestones have not been defined.

The business continuity communication plans were utilized on one occasion in 2013/14, at the time of a University-wide closure due to inclement weather, enacting essential services protocol.

OMAFRA is notified of incidents with the potential to impact receipt of OMAFRA samples or delivery of results to OMAFRA with established project requirements.

AFL will continue to work in partnership with OMAFRA to test and to implement continuous improvements to the Business Continuity, Emergency Response and Surge Capacity Planning documents and processes. Schedule "G" activities consolidate our organizations' efforts to address incidents and events of critical concern. The outcomes of these incidents and recovery activities influence our abilities to fulfill our collective mandate to protect the public health of Ontarians through food safety.

## Animal Health Laboratory

After the Year 5 review, the Schedule G milestones are determined annually. AHL works with its partners to meet its responsibilities under Schedule G. For 2013/14, it participated in several activities related to emergency preparedness. See performance indicator AHL8 for details. Business Continuity and Emergency Response plans remain in place.

**Business Continuity**

The list of "essential staff" for LSD is updated every fall in order to define staff expected to report to work in the case of a weather event, e.g., snow day. The only events in 2013/14 were the ice storm of December 22, 2013, which had no effect on operations of AHL-Guelph or AHL-Kemptville, and the two snow days on December 23 & 24$^{th}$ during which essential staff reported for work as expected, but clients were not served. Combining this unexpected University closure along with the snow days left staffing short, even though service did continue throughout the holiday period.

Surge capacity is maintained year-round, and has benefited from the acquisition of high-volume equipment funded by OMAFRA. The major high-volume emergency testing event in 2013/14 occurred as the result of the incursion of porcine epidemic diarrhea (PED) into Ontario in January 2014. Based on the emergence of PED in the USA in May 2013, the AHL had a triplex real-time PCR test (PEDV-TGEV-PCoV) validated and ready for use, and identified the index case in Canada on January 22, 2014. The test was shared with labs across Canada.

63 infected herds were identified in Ontario as of summer 2014. In the initial 5 weeks of the outbreak, the AHL tested 200 samples per day, on a 6-day/week basis. Including environmental testing, ~13,000 PEDV tests were conducted by the AHL, without interruption of normal workload.

In March, 2014, porcine deltacoronavirus (PDCoV) was also identified in pigs in Ontario with signs of vomiting and diarrhea. The triplex PCR test was hence updated to replace the generic porcine coronavirus (PCoV) with PDCoV. The presence of the highly contagious PEDV in Ontario highlighted the need for strict biosecurity and biocontainment of such important pathogens, and led to the plan for renovation of Specimen Reception in AHL-Guelph.

**Emergency Preparedness**

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.

On October 11, 2013 (Kemptville) and November 6, 2013 (Guelph), a foreign animal disease (FAD) simulation was held in the AHL post-mortem laboratories. There were two objectives of the exercises: 1) to test and validate the standard operating procedures regarding management of a FAD investigation in the post-mortem laboratory; 2) to evaluate joint coordination and communication among the AHL, University of Guelph, and the Canadian Food Inspection Agency.

Both laboratories were involved with autopsy of birds infected with suspected “Sneezing chicken disease”, collection of tissue samples, and communicating with CFIA staff who were involved in picking up samples to forward for confirmatory testing. AHL staff conducted appropriate steps for disposing of infected carcasses, disinfection of contaminated facilities and decontamination of AHL staff. For further details see performance indicator AHL8.

As noted above, the major emergency situation that arose in animal health in Ontario during 2013/14 was the emergence of porcine epidemic diarrhea (PED). The AHL was prepared with a triplex PCR, and worked 6 days a week for the first 5 weeks of the outbreak to provide rapid response to the testing needs of field and OMAFRA veterinarians.

# SCHEDULE N: JOINT INTELLECTUAL PROPERTY (OMAFRA AND U OF G)

The Joint Intellectual Property Management Committee is a sub-group of the Research Committee. It is co-chaired by the OMAFRA Director of Research & Innovation Branch, and the U of G Director of the Catalyst Centre.

The Joint IP Committee uses Research Performance Indicator #8 as its metric:

*Patents, products, licenses granted to existing or start-up companies, existing businesses spun out and community-based service businesses created and the economic impact.*

Please see page 99 for reporting details.

For a description of 2013/14 highlights in 'research commercialization' of joint intellectual property, please see page 16.

The table below is a listing of relevant intellectual properties licensed and patented under the Agreement as of the end of 2013/14.

## APPENDIX A–1: LICENSED TECHNOLOGIES BY INVENTOR

(2013/14)

| Inventor / Tech ID | Technology Title | Status |
|---|---|---|
| Mohanty 20140319b | Bioblack | Licensed - Exclusive |
| Mohanty 20140319a | Biochar | Licensed - Exclusive |
| Kott 20140318 | Corn Embryos | Option |
| Mohanty 20130901 | Biocomposite materials containing natural fibre and biochar | Option |
| Raizada 20140101a | Screening for Nitrogen Fixation | Option |
| ZZ Soybean 20140213c | SeCan 11-35C | Germplasm License - Exclusive |
| ZZ Apple 20130906 | Apple Rootstock V1 to V7 | Germplasm License - Exclusive |
| ZZ Wheat 20131017 | C5-116 wheat | Germplasm License - Exclusive |
| ZZ Soybean 20140213a | SeCan 11-05C | Germplasm License - Exclusive |
| ZZ Soybean 20140213d | SeCan 11-40C | Germplasm License - Exclusive |
| ZZ Soybean 20140213b | SeCan 11-12C | Germplasm License - Exclusive |

| | | |
|---|---|---|
| ZZ Tomato 20140428 | 2014 Schedule 1 Amendment | Amending Agreement |
| ZZ Soybean 20131216 | AMEND #5 | Amending Agreement |
| ZZ Soybean 20131119e | Amendment 2 OAC Erin | Amending Agreement |
| ZZ Soybean 20131119d | Amendment 1 OAC Prudence | Amending Agreement |
| ZZ Soybean 20131119c | Amendment 1 OAC Oxford | Amending Agreement |
| ZZ Soybean 20131119b | Amendment 1 OAC Huron | Amending Agreement |
| ZZ Soybean 20131119a | Amendment 1 OAC Heritage | Amending Agreement |
| ZZ Soybean 20131111c | Amendment 2 OAC Madoc | Amending Agreement |
| ZZ Soybean 20131111b | Amendment 2 OAC Lakeview | Amending Agreement |
| ZZ Soybean 20131111a | Amendment 2 OAC Brooke | Amending Agreement |
| ZZ Soybean 20130930b | Amendment 2 OAC Bayfield | Amending Agreement |
| ZZ Soybean 20130930 | Amendment 2 OAC Bayfield | Amending Agreement |
| ZZ Soybean 20130920b | Amendment 1 OAC Avatar | Amending Agreement |
| ZZ Soybean 20130920a | Amendment 1 to OAC Brooke | Amending Agreement |
| ZZ Soybean 20130429s | Amend# 1 - DH4202 | Amending Agreement |
| ZZ Soybean 20130429r | Amend #1 - DH5170 | Amending Agreement |
| ZZ Soybean 20130429q | Amend #1 - DH4173 | Amending Agreement |
| ZZ Soybean 20130429p | Amend #1 - DH748 | Amending Agreement |
| ZZ Soybean 20130429o | Amend #1 - DH715L | Amending Agreement |
| ZZ Soybean 20130429n | Amend #1 - DH618 Soybean | Amending Agreement |
| ZZ Soybean 20130429m | Amend #1 - DH530 | Amending Agreement |
| ZZ Soybean 20130429l | Amend #2 - DH420 Soybean | Amending Agreement |
| ZZ Soybean 20130429k | Amend #2 - DH410 | Amending Agreement |
| ZZ Soybean 20130429j | Amend #2 - MFA Soybean | Amending Agreement |

| | | |
|---|---|---|
| ZZ Soybean 20130429i | Amend #1 - RCAT 1001 | Amending Agreement |
| ZZ Soybean 20130429h | Amend #1 - RCAT 1008 | Amending Agreement |
| ZZ Soybean 20130429g | Amend #1 - RCAT 0908 | Amending Agreement |
| ZZ Soybean 20130429f | Amend #1 - RCAT 0905N | Amending Agreement |
| ZZ Soybean 20130429e | Amend #1 - PRO 30-05 | Amending Agreement |
| ZZ Soybean 20130429d | Amend #2 - OAC Sunny | Amending Agreement |
| ZZ Soybean 20130429c | Amend #1 - Katrina | Amending Agreement |
| ZZ Soybean 20130429b | Amend #1 - OAC Prodigy | Amending Agreement |
| ZZ Soybean 20130429a | Amend #2 - RCAT 0804 | Amending Agreement |
| ZZ Seed 20130513 | Amendment #2, Schedules to Option Agreement | Amending Agreement |
| ZZ Oat 20130429b | Amend #1 - RC Amaze Oat | Amending Agreement |
| ZZ Oat 20130429a | Amend #1 - OAC Markdale OAT | Amending Agreement |
| ZZ Barley 20131119 | Amendment 1 OAC Kawartha | Amending Agreement |
| ZZ Barley 20130917 | Amendment #1 OAC Ripley | Amending Agreement |

## APPENDIX A-2: OMAFRA FUNDED TECHNOLOGY RESULTS

(2013/14)

| | Catalyst Centre Total | # OMAFRA | % OMAFRA |
|---|---|---|---|
| **Disclosures** | 192 | 167 | 87% |
| Non-Seed | 37 | 12 | 32% |
| Seed | 155 | 155 | 100% |
| **Agreements** | 55 | 49 | 89% |
| Non seed licenses | 11 | 5 | 45% |
| Seed licenses | 44 | 44 | 100% |
| **Active Licenses** | 212 | 172 | 81% |
| Non-seed | 63 | 23 | 37% |
| Seed | 149 | 149 | 100% |
| **Patents Filed** | 35 | 17 | 49% |
| **Patents Issued** | 15 | 3 | 20% |
| **Royalty Revenue** | $ 2,174,340 | $ 674,537 | 31% |
| Non-Seed | $ 1,251,714 | $ 177,376 | 14% |
| Seed | $ 922,626 | $ 497,160 | 54% |

## APPENDIX A-3: MOST SIGNIFICANT ROYALTY-BEARING GERMPLASM VARIETIES

(2013/14)

| Species | Variety | 2013/14 net revenue | |
|---|---|---|---|
| | | $ | % of total royalty |
| Barley | Dignity | 38,805 | 4% |
| Soybean | DH 410 | 127,157 | 14% |
| Soybean | DH 530 | 103,551 | 11% |
| Soybean | OAC Wallace | 95,290 | 10% |
| Soybean | RCAT Corbett | 60,062 | 7% |
| Beans | Lightning | 18,783 | 2% |
| Asparagus | Guelph Millennium | 130,030 | 14% |
| Tomato | [confidential] | 34,623 | 4% |

# APPENDIX A-4: PROOF OF PRINCIPAL (POP) FUNDED RESEARCH PROJECTS

(2013/14)

| Project Title | Primary Investigator | Value | Result |
|---|---|---|---|
| Vegetated roofing system refinement and manufacturing | Youbin Zheng | $49,410 | Provisional patent application filed |
| Development of a vaccine for necrotizing enteritis of foals | John Prescott | $35,000 | Patents filed using research results generated & Option agreement secured |
| Optimization of a Serological Test for Johne's Disease | Lucy Mutharia | $50,000 | Patents filed – Collaboration formed. Seeking licensees |
| High rosmarinic acid mint to treat inflammation in horses | Laima Kott | $18,500 | Success – License issued |
| Boar taint solution | Jim Squires | $24,000 | Success – POP research lead to industry sponsored research project |
| Tomatoes with early red colouring | Steve Loewen | $12,225 | Research ongoing |
| Phosphopeptide-based interventions | Yoshi Mine | $25,000 | Marketing of technology to industry ongoing |
| Soy cheese (blend of soy & milk protein soft cheese) | Milena Corredig | $5,500 | Scientific success – marketing of technology to industry ongoing |
| 1,3-Diacylglycerols for hard fat applications | Rob Lencki | $45,000 | Scientific success – marketing of technology to industry ongoing |

# APPENDIX B: OMAFRA - U OF G AUDITED STATEMENT OF REVENUES AND EXPENSES

See separate attachment, following.