

**UNIVERSITY  
of GUELPH**



**Ontario Ministry of Agriculture,  
Food and Rural Affairs**

**SCIENCE, TECHNOLOGY AND PEOPLE**

# **ANNUAL REPORT FOR FISCAL YEAR 2005/2006**

## **OMAFRA-FUNDED RESEARCH, EDUCATION AND LABORATORY SERVICES PROGRAMS**

Integrated Research, Education and Laboratories Programs  
Serving Ontario's Agriculture and Food Industries

September 30, 2006

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Report compiled by Ken Hough, Christine Taub and Office of Research support staff.

# EXECUTIVE SUMMARY

## Background

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 Agreement. This is the fourth Annual Report under the current 5-year agreement between the University of Guelph (U of G) and OMAFRA, which was signed March 20, 2002. As agreed to and signed by both parties the OMAFRA / U of G Agreement has been extended by one year to March 31, 2008.

The period covered by this Annual Report is the University's 2005/2006 fiscal year (May 1, 2005 though April 30, 2006). The report covers the activities, budgets, expenditures and performance measures for each of the four program areas encompassed by the Agreement – **Research, Diploma Education, Veterinary Clinical Education** and **Laboratory Services**.

## Summary of Activities and Results

All Performance Measures Agreements (PMAs) of the OMAFRA/U of G Agreement are reported on in much greater detail later in this report. The PMAs were unchanged from the previous year.

Within the research area, three projects were implemented under the newly constituted Bioproducts **Research Program** following the submission of Letters of Intent (LOI) and full proposals through the fall and winter of the previous fiscal year. Operating funding for the Bioproducts program was transferred in part from ending projects in the Animal and Plant program. A second call for LOI and proposals under the Bioproducts Program was conducted in 2005/2006.

The initial call in the Sustainable Production Systems Program resulted in 32 LOI submitted. The LOI Review Committee selected 19 of these for submission of full proposals (18 submitted). Following external peer review of the science embodied in the proposals, the Full Proposal Review Committee recommended 7 of these for funding, beginning in May 2006.

All remaining Plant Program projects entered their final year of funding, being due for completion in April 2006. In the Animal Program, several projects initiated one or two years previously were extended to have a completion date of April 2007. This was done in order to distribute the awarding of operating monies being transferred to the Sustainable Production Systems Program out over two years. A second call for LOI in the SP2 program was planned for summer 2006.

All new projects initiated under these programs are implemented as integrated issue-based or 'value chain' projects

There were 278 active research projects in 2005/06. This is down slightly from the 297 projects in the 2004/05 fiscal year, primarily because each project under the new integrated proposal structure encompasses a number of research areas that formerly would have each been addressed through individual projects. Highlights from some projects in all six research programs are provided in the Research Program Overview section of this report.

Research funding received by the University of Guelph outside of but related to the OMAFRA Agreement increased to \$66.9 million in 2005/06, up 15% from the \$58.0 million reported for 2004/05.

The numbers of articles in the popular press in 2005/06 are down slightly from last years numbers this is due to many of the popular press articles are now written by SPARK writers. Committee memberships in 2005/06 increased substantially. The numbers of presentations at scientific conferences increased substantially and exceeded the 2003/04 numbers. Presentations to industry and stakeholder groups decreased from the previous year; (see table 1.2.1 for details).

The SPARK (Students Promoting Awareness of Research Knowledge) program was again a prolific source of 71 articles for a variety of publications, providing profile for U of G research projects in 2005/06. These articles appeared in a number of media, including a variety of commodity organization publications, agri-food sector print publications, syndicated columns, periodicals, and the University's **Research** magazine. Through the agreement with OMAFRA's Town & Country Ontario television, the SPARK students continue to contribute InfoBreaks to that program as well.

OMAFRA/ARIO received \$676,129 in royalties during this past fiscal year. This represents an increase of 11% over the previous years' amount of \$608,829. It should be noted that the germplasm revenue from the previous year included \$122,687 in collections of unpaid royalties from years prior to that.

The delivery of Diploma Programs, 2005/06 has again been a year of making further adjustments and fine-tuning of programs following the major changes that have occurred since 2003/04. Enrolments in Diploma Programs at regional campuses increased in 2005/06, from 857 to 861 or 1.0 % from the previous year. Student graduations, employment statistics and attrition data are detailed in the report (Tables 2.2.2 and 2.2.4). 2005/06 marked a significant change as the title "campus" was adopted by each of the regional colleges.

Total revenues from Continuing Education (CE) Programs at the regional campuses continue to grow, exceeding \$5.3 million in 2005/2006.

The Veterinary Clinical Education Program (VCEP) continued to provide support for the Veterinary Teaching Hospital, advanced clinical training, an externship and a 1-year post-graduate Veterinary Internship Program. As well, 29 of the 50 students enrolled in the graduate D.V.Sc. Program were supported by the VCEP Program.

The Laboratory Services Division (LS) continued to provide high-quality testing and diagnostic services to public and private clients in the agriculture, food and veterinary industries. The Animal Health Laboratory (AHL) performed about 677,000 procedures in support of disease surveillance. The Analytical Laboratory performed approximately 1,007,000 procedures for plants, soil, water and food. As a result of developing new programs in 2003/04 to expand on the number of test methods accredited to ISO 17025 standards, 36 new tests were accredited in 2005/06. LS is the first non-government laboratory to become accredited for method development and non routine testing. In addition, LS became licensed for water testing. Total revenue from outside the agreement increased to \$12.0 million from \$9.1 million in 2004/05.

# 1. Research Program

## 1.1 Accomplishments in 2005/2006

### Management Accomplishments

- Continuing the pattern established with the introduction in 2004/2005 of the Food and Environment programs based on integrated, outcomes-based research proposals, the first three proposals were initiated in the new **Bioproducts Research Program** in fiscal 2005/2006. The implementation of these three projects, based on ~\$370K of annual project operating funding, was delayed until late summer, following a longer than expected proposal and approval process. However, each of these projects progressed well through the balance of the fiscal year. The Bioproducts Research Program is a new venture under the OMAFRA / U of G Agreement, building on the University's research expertise in life, physical and chemical sciences. However, the introduction of this program challenges Guelph researchers to develop linkages with bioproducts industry end users and build collaborations with researchers from other universities and institutes who have complementary expertise and contacts in bioproducts applications. Additional calls for LOI and proposals through the fall and winter of 2005/2006 were undertaken, resulting in an additional proposal being approved for commencement in summer 2006. A further call for LOI is underway in summer 2006 to seek additional suitable proposals to fund within the \$1 million budget for the Bioproducts Research Program.
- Following the planning and extensive communications efforts over the previous year with U of G researchers (Guelph, Ridgetown Kemptville and Alfred campuses) regarding the implementation of the **Sustainable Production Systems Program** (SP2), the call for Letters of Intent (LOI) was issued in July 2005. A total of 32 LOI were submitted and evaluated by the SP2 LOI Review Committee who selected 19 for submission of a full proposal. Researchers were directed to provide information on potential intellectual property arising from their research, and explain how any constraints to freedom to operate, licensing or commercialization would be addressed. Each full proposal (18 submitted) was distributed for peer review of the proposal science (encompassing 15 US, 2 international and 3 Canadian Universities, plus 11 Agriculture and Agri-Food Canada (AAFC) and 3 United States Department of Agriculture (USDA) scientists) and then evaluated by the SP2 Full Proposal Review Committee (comprised of different people than the LOI Review Committee, but with a similar makeup – agri-food industry representatives, and personnel from other research institutions and other government Ministries in addition to OMAFRA and U of G research people). The Committee recommended that 7 of these proposals receive operating funding – 5 livestock-based (2 swine, 1 poultry, 1 beef, 1 livestock reproduction) and 2 crops-based (1 each in pest management and controlled environment systems). Since the available funding (~\$900K) was insufficient to fund all seven proposals at 100%, the team leaders were consulted and all agreed they could proceed with slightly modified milestones and deliverables if funded at 90% of their original request.
- Within the **Food and Resources Management and Environment** programs, the second annual reports for the integrated, outcomes-based ('value-chain') proposals received in winter 2006 showed acceptable progress was being achieved in most. However, in a few Food program projects limited progress was reported on several milestones. Leaders for these projects were requested to submit an interim report as of September 2006 demonstrating how the researchers planned to get their research back on the originally projected timelines in

order to justify further investment of OMAFRA operating funds.

- The Plant Research Program entered its fourth and final year in 2005/2006, with final reports being filed for the projects, most of which had been underway for the past four years. As of April 30, 2006, all funding in the Plants Program would be transferred to the Sustainable Production Systems and Bioproducts research programs.
- In the Animal Program, a large number of projects were due for completion by April 2006 with the assigned operating funding due for reallocation to the Bioproducts and Sustainable Production Systems programs. However, a number of projects in each of the 7 species sub-programs had been extended to end in April 2007, at which time the assigned operating funding will be transferred to these other programs.
- A fundamental change within the OMAFRA / U of G Agreement was implemented in May 2005 with the introduction of the Research Station Services and Access (RSSA) Fees that are levied on a per research unit basis, i.e., number of acres used or number of 'animal days' used. The RSSA Fees cover all of the direct operating costs of the research stations, but exclude building or land ownership, maintenance or capital costs (these are still paid for entirely by OMAFRA). The fees are intended to:
  - Ensure equitable sharing of the cost of the research stations among all research partners benefiting from their use,
  - Improve the sustainability of the research stations over the long term and allow budgets to adapt to inflation,
  - Ensure that the cost of operating the research stations will be transparent to all stakeholders,
  - Provide a mechanism whereby more OMAFRA program funding is available for investment in project operating awards, yet ensure that combined partner / OMAFRA project operating support levels are maintained and funding partners do not face an undue burden when paying their share of the RSSA fees.
- Another change in 2005/2006 was the implementation of indirect costs charges on all research grants as of June 2005. Although these indirect costs charges are not applicable to OMAFRA/ U of G Research Program funds, they are noted here because they are levied on research grants and contracts that are used as partner funding for OMAFRA/ U of G projects. Previously, indirect cost charges were levied only on all research contracts. Indirect costs are expenditures that can not be classified as a direct cost of a single program and include such expenses as:
  - Central services such as finance, personnel, custodial, security, environmental health & safety, animal care services, mail, library, central computing & communications
  - Operation & maintenance of the physical plant including heat, hydro, lights and equipment and building repair & replacement
  - Departmental costs such as secretarial/clerical support staff, office equipment & supplies, computing systems & IT support staff

Indirect costs are higher for 'Contract Research' projects where Intellectual Property protection and/or specific financial or reporting deliverables are required (versus research 'grants' where IP protection is not an issue and reporting requirements are generally basic). Specific rates for indirect cost charges apply at different campuses or research stations (since some of the indirect cost activities are covered by funding through the OMAFRA/U of G Agreement) and are calculated as a percentage of direct project costs not including funds directed to RSSA fees or to graduate student stipends.

In August 2005 the Minister of Agriculture, Food and Rural Affairs announced that ownership of the 3 regional campuses (Alfred, Kemptville, Ridgetown) and 14 OMAFRA research stations (Alma, Arkell, Bradford, Cedar Springs, Elora, Emo, Guelph, Huron, New Liskeard, Ponsonby, Simcoe, Vineland, Winchester, Woodstock) was to be transferred from the Ontario Realty Corporation to the Agricultural Research Institute of Ontario. As a result of this transfer, the University would undertake oversight of the facility operations and maintenance (O&M) programs for the facilities on these sites, with the O&M budget to be transferred from ORC effective April 1, 2006. Planning and preparation for the transfer was conducted in cooperation with OMAFRA through the fall and winter of 2005/2006. In April 2006 the University hired Remo Pallottini to be Facilities Manager, ARIO Properties.

Dr. Alan Wildeman was reappointed to a second five-year term as Vice-President (Research).

## **Highlights of Research Accomplishments**

Several highlights of the past year's research are listed below under each of the research program areas.

### **Animal Research Program**

Many projects in the Animal Research Program completed their final year in the 2005/06 fiscal period, coinciding with the transition to a new structure of enlarged, team-based, and cross-disciplinary research within the recently established Sustainable Production Systems Program (SP2). Accordingly, approximately 50% of the research projects within the Animal Program were completed as of April 2006. Overall, there were fewer projects registered in the Animal Program than in previous years, and most new research initiatives within the individual species sub-programs were being re-engineered by our faculty to comply with the updated submission requirements of the SP2 Program. Consequently, this summary represents the annual reporting of highlights of the Animal Research Program and its species subprograms for 2005/06. The remaining 96 projects in the Animal Program will be reported on in next year's Annual Report.

In spite of the transition period of the Animal Program, research faculty continued to make impressive contributions in their respective areas of species based research. Our strength is that the research capacity at the University of Guelph remains focussed around both individual animal species, as well as discipline areas of expertise, so we expect a relatively smooth and productive evolution of the species subprograms described below into the new SP2 initiative.

### **Highlights of the Animal Program:**

#### **Aquaculture Sub-program:**

Much of the interdisciplinary work in the aquaculture program has been driven by the combined goals of; improving the environmental fitness of farms, reducing conflicts between the wide variety of aquatic user-groups in the province, enhancing fish health and consumer product quality, and facilitating the development of appropriate legislative tools to regulate aquaculture through enhanced interface between scientists and policy experts within the public sector. Below are a few highlights of our achievements in these areas.

- Fish health studies have advanced our understanding of antimicrobial resistance of *Flavobacterium psychrophilum*, one of Ontario's most significant fish pathogens in farmed stocks. Further work on evaluating acute phase, inflammatory reactions in rainbow trout has also helped in our understanding

of innate protective mechanisms in fish, and may be useful in the genetic selection of more pathogen resistant strains of domestic trout.

- Faculty completed a number of significant industry sponsored research projects in the last fiscal year. A variety of contracted studies for both domestic and foreign feed supply companies have helped to refine more cost-effective feed formulas, as well as assisted in the selection of various alternate protein feed ingredients, which will help to reduce both the environmental impacts of nutrient release from fish farms, as well as xenobiotic accumulation in consumable flesh. This is important work which provides assistance to the private sector in near-commercial product development.
- Continued advancements were made in the improvement of nutrient and energy modeling work in fish nutrition, and these have led to the development of enhanced diet formulations that significantly reduced both fecal and soluble waste outputs. This work has the potential to help lower water quality impacts from commercial farms, especially cage-aquaculture facilities, which utilize open-lake, and open-system configurations. Research findings from these studies have assisted both the Ontario Ministry of Natural Resources as well as the Ministry of Environment in refining their regulatory approaches to aquaculture.
- Stable isotope work on feed ingredients and fecal waste, along with complementary studies on evaluating the Biochemical Oxygen Demand (BOD) of various fish diets, has enabled a better understanding of the dispersion characteristics and fate of solid waste materials produced by aquaculture. These studies will improve environmental sustainability through more precise modelling of water quality and hypolimnetic impacts of cage aquaculture.
- Engineering research on hybrid membrane filters has now been completed, and improved technology for the reduction of solid and phosphorus wastes from recirculation facilities is now available.
- Over the last year, we have presented our work on the development of an enhanced decision support tools, which are now being considered by both provincial and federal regulatory authorities for incorporation into their licence evaluation framework. This tool has permitted the bridging of the latest scientific information on fish health, and quantitative environmental assessment approaches, with the regulatory and policy framework which governs aquaculture in Ontario. Several program faculty made significant steps forward in the last fiscal year in communication outreach with our government partners in this area.
- Finally, the program has completed several important studies in fish behaviour and welfare assessment which will hopefully lead to improved acceptability of fish farming practices by the general public.

#### **Beef Sub-program:**

The beef research program was very active in 2005/06, encompassing a large contingent of discipline research expertise, and completing a wide array of studies in nutrition, feeding, genetics and animal health. Below are a few examples of significant highlights of recent research studies which are expected to have substantive, positive impacts in the near-term for Ontario's Beef industry.

- Several studies which bridged the nutrition and genetics areas will be used to devise strategies to improve selection of more 'efficient' animals that will permit feeding strategies to enhance nutrient and energy utilization (and therefore feed efficiency) in beef cattle. These works are important to the long-term economic viability of the beef industry, and will allow for fine-tuning various strategies to meet marketplace needs for unique consumer products.

- Novel research focussed on pneumonic pasteurellosis looked at methods to exploit immuno-modulating factors that can be used to enhance an animal's responsiveness to vaccination at early life history stages. This important work will ensure the development of improved vaccines which will lead to better individual and herd health, which will enable continued economic competitiveness of Ontario's beef industry.
- Improved understanding of ways to increase the utilization of cull cow beef will help reduce product inconsistency and allow greater usage of this product in the Canadian marketplace.
- Several genetics studies were aimed at natural selection for tenderness, in order to enhance consumer acceptability and economic returns through accessing unique market opportunities made possible by a 'guaranteed tender' product. Various studies were underway to develop selection tools which will be used to improve this important trait.
- Modified feeding strategies are being developed to improve production costs and decrease carcass fat levels. The approaches are showing several benefits including; reduced feed usage, improved product quality, lower manure production, and reduced greenhouse gas emissions. These are significant benefits to both small and large-scale beef producers.
- Identification of risk factors associated with *E. coli* 0157:H7 in beef animals will help to lower food and waterborne illness from this pathogen. Because cattle are a major reservoir for this organism, better control mechanisms are necessary to control negative impacts on public health, along with the associated impacts to the beef industry due to negative image. This research is expected to have significant benefits for the industry in Ontario, and across Canada.

#### **Dairy Sub-program:**

- Sickness behaviour was investigated in neonatal dairy calves with diarrhea. There were substantial changes in activity, physiological parameters and intake. Treatment with a non-steroidal anti-inflammatory agent one time resulted in significant improvements in calf behaviour, appetite, and performance as compared to placebo-treated calves.
- Epidemiological studies have confirmed that *Cryptosporidia parvum* is a very common cause of diarrhea in dairy calves, and that time spent with the dam and some housing features are strong risk factors for this infestation. Also, the specific agents involved can also cause human infections and represent a considerable potential for zoonotic disease.
- Studies are underway and nearing completion, which will summarize the prevalence and risk factors for stillbirth in Canadian dairy herds. Stillbirth occurs in approximately 10% of Holstein calvings in Canada, and about 13% at first-calving. The ratio between maternal and calf weight seems to be an important factor.
- Feeding strategies to influence the methane emissions from dairy cattle are currently ongoing. Portable monitoring equipment has been developed and implemented to study this subject, both in a research setting and on commercial dairy farms. It has been found that methane emissions are approximately 15% reduced with cracked corn in the ration, as opposed to steam-flaked corn.
- Approximately 20% of Ontario dairy cattle experience postpartum anestrus. In other words, between calving and the beginning of the intended breeding period, a large percentage of Ontario cows do not commence cyclic reproductive activity. Postpartum negative energy balance and other periparturient

disease are strong risk factors for this problem. Supplemental progesterone has been established as one method of dealing with this issue.

- The Dairy Farmers of Ontario are in the process of mandatory installation of Time and Temperature Recorders in the bulk tank and pipeline of every Ontario herd by the beginning of 2007. A research study has documented the impact of these devices on the bacteriological milk quality of the implementation of these instruments. It has been found that significant improvement in Bactoscan readings follows use of this equipment.
- Studies on management of pain at dehorning in dairy calves have yielded interesting results. Unless this procedure is done in very young calves, there is considerable pain associated with the dehorning event. The use of non-steroidal anti-inflammatory agents is a beneficial addition to the administration of local anesthetic.
- An extremely large study in hundreds of dairy herds has collected, analyzed, and interpreted information collected by commercial hoof trimmers in Ontario herds. Approximately 30 – 35 % of cows have lesions at the time of trimming. The most common lesion identified was digital dermatitis (hairy heel wart disease). However, lesions involving the hoof horn, such as sole ulcers or white line disease had a greater impact on reduced production.

#### **Equine Sub-program:**

- Equine influenza: Twenty-three outbreaks of respiratory disease were reported in Ontario from October 2003 to October 2005. Nasopharyngeal swabs and paired serum samples were collected from a total of 115 horses. Overall Equine influenza was diagnosed in 13 outbreaks in Ontario, as demonstrated by the Single Radial Haemolysis test. Surprisingly, seroconversion or presence of a high titer against equine Rhinovirus (ERV1) was present in 12 of the 23 outbreaks and further all except 1 outbreak of equine influenza virus infection was isolated or recognized along ERV-1. In conclusion, equine influenza virus AE2-H3N8 was found to be an important cause of equine respiratory disease affecting the young performance Ontario horses. Undoubtedly, the ERV1 (similar to the well recognized one in human as the common cold virus) was a common contributor to equine respiratory viral diseases. Unfortunately the ERV-1 is not included in any of the available equine viral vaccines worldwide.
- Implants for the treatment of septic arthritis: Septic arthritis is a common problem in horses that results from trauma, surgery or intraarticular injection. Without prompt and aggressive treatment, irreversible career-ending joint tissue damage may occur. Current therapy consists of systemic and intra-articular antibiotics combined with joint lavage, debridement and drainage. A sustained high local concentration of antibiotics must be present to eliminate bacteria from an infected joint: which is not being achieved by systemically administered antimicrobials. Local delivery techniques exist to achieve high antimicrobial concentrations. The study showed that biodegradable antibiotic impregnated hyaluronic acid implants for sustained antibiotic delivery provided an aggressive, yet time efficient and low risk, treatment for septic arthritis in horses. Further the information resulting from the present study enables clinicians to more effectively treat equine joint infections caused by antibiotic resistant bacteria.
- Colic: Colic is one of the most common medical problems encountered in the equine industry. Abnormalities in gastrointestinal motility may arise following various insults to the digestive tract. These abnormalities may be a result of intestinal inflammation, surgical sequelae, or idiopathic in origin. All of these abnormalities can result in ileus (complete stop of intestinal movement), a potentially fatal condition. Multiple drugs with prokinetic activity have been given with the intent to

activate the intestinal movement but showed variable success. One of those prokinetic agents is Erythromycin. It is an antibiotic commonly used to treat a variety of bacterial infections and has also been used empirically to improve intestinal motility. Further erythromycin must be used with caution as it often induces severe diarrhea (colitis). The results of this research demonstrate that the use of erythromycin as a prokinetic agent was not useful in the treatment of colic as had originally been believed.

- Foal pneumonia: *Rhodococcus equi* pneumonia is the most important bacterial infection of young foals on a global basis, and a very serious problem on some breeding farms in Ontario. Current control measures are highly expensive and only partially effective. Production of an effective, easily administered vaccine would make management of this disease on endemically-affected farms considerably easier and less expensive than current approaches. This study shows that intra-bronchial administration of a mutant of *Rhodococcus equi* which does not cause disease in 3-week-old foals protected 3 of 5 foals from subsequent *R. equi* infection at 3 weeks of age. The results are further evidence that there is an age-related immunological defect in foals that makes them unable to mount an effective immune response to *R. equi*. Therefore further studies are needed to understand the reasons for the poor response of some foals to immunization with a *Rhodococcus equi* vaccine.
- Equine airway disease: Recurrent airway obstruction (RAO) or inflammatory airway disease is a very common and extremely debilitating disease in stabled horses. The reasons why the disease consistently progresses in horses that are sensitized to environmental dust and molds remain incompletely understood. In this research we have identified a likely key component of the disease process. We showed that the decrease of a very important protein is associated with **progressive disease**. At present using this key protein, a test is being developed which would allow an earlier diagnose of the disease.

#### **Pork Sub-program:**

- By using isotope tracers to label the nitrogen in pig manure, researchers are able to study directly the use of manure nitrogen by plants for growth.
- The addition of fresh seminal plasma to boar semen that has been stored in a frozen form improves fertilization rates.
- One of the main factors that contributes to sub-standard reproductive performance on commercial swine farms is poor semen storage conditions.
- The University of Guelph has tracked disease on a large number of commercial swine farms in Ontario since 2001 and has identified a new strain of influenza virus that has been spreading rapidly since 2004.
- The pigs' ability to respond to an immune challenge is determined by its genetic makeup. However, the pigs' immune response may also be enhanced by selective stimulation of the immune response within one week after birth.
- At the University of Guelph, the fifth generation of the Enviropig has been produced successfully. Management of these animals is identical to that of conventional pigs.
- There is substantial variability in pork meat quality among pigs from individual farms and between pigs from different farms. The impact of a wide range of management factors on pork meat quality is

being explored. The inherent temperament of pigs, evaluated by the pigs' response to novel objects, has been related to metabolic indicators of stress and pork meat quality.

- By capitalizing on compensatory growth in pigs, both nutrient utilization efficiency and aspects of pork meat quality can be enhanced.
- Key genes have been identified that are associated with substandard pork meat quality.
- A novel probe, using fluorescence in situ hybridization technology, has been developed to quickly and reliably quantify salmonella in biological samples.
- In the swine liquid feeding research program it has been established that corn steep water (a co-product from the corn syrup industry) that is treated with phytase can be a cost-effective feed ingredient.
- By formulating pig diets more accurately based on digestible calcium and phosphorus levels in feed ingredients, phosphorus utilization can be enhanced and the environmental impact of pig production reduced.

**Poultry Sub-program:**

- Different avenues have been taken to formulate effective vaccines against important poultry diseases:
  - a) Proteomic approach to identify key antigens of *Clostridium perfringens* that are associated with immunity to necrotic enteritis in broiler chickens; proteomics would permit a more rational approach to antigen selection for vaccine production which would permit greatly reduced reliance on in-feed anticoccidial use in birds destined for human consumption.
  - b) Genomic approach to develop of a versatile fowl adenovirus serotype 9 (FAdV-9) vector which can express foreign genes and in turn the expressed immunogenic protein can induce protective immunity in vaccinated chickens for example against Newcastle disease
  - c) RNA interference methodology against influenza virus
- New and improved diagnostic tests for example for Marek's disease have been developed which will aid in its early identification.
- Studies on the pathogenesis of infectious bronchitis, and on the mechanism and role of hemostasis in the etiology of fatty liver hemorrhagic syndrome in laying hens greatly enhanced our understanding of these diseases
- Probiotics with superior ability in reduction of Salmonella burden were identified.
- Designer eggs that are enriched in lutein by using flax in the birds' diet have been created.
- Studies on the molecular mechanisms involved in the endocrine control of reproduction in poultry resulted in the identification of the GnRH receptor in chicken.
- The work on finding novel gums to be used by the poultry meat industry could help produce acceptable low calorie meat products.
- Four "heritage lines" of chickens, a generous donation from Dr. Shaver, are the recent addition to the Poultry Research Station, greatly enhancing the research capabilities at the University in helping to study the effect and influence of the genetic background on the immune response to infectious agents, disease pathogenesis, behaviour etc.

### **Sheep Sub-program:**

Fiscal 2005/06 represented the first year that the sheep program did not approve new projects due to the change in the structure of the OMAFRA program. It saw the completion of several projects, specifically:

- Gamma-interferon assay for eradication of caseous lymphadenitis: This project has resulted in the development of a highly sensitive and specific test for detection of infection with *Corynebacterium pseudotuberculosis*. It detects cell-mediated immunity rather than antibodies and so appears to be a superior test to others currently used. The developers intend to apply for a LAIF grant in order to bring the test to commercial production.
- Spermatogonial culture and transplantation: This project has made significant headway into a new method for moving genetics into “recipient” males, specifically young rams. If ultimately successful, this technology may result in an alternative to embryo transfer for amplifying valuable genetics in a short period of time and into communities that cannot manage ET technology. This research focus is part of the SP2 program and is continuing forward.
- Enhanced genetic evaluation techniques for ewe reproductive traits: This project is part of a series which has brought many new tools for genetic evaluation of prolific ewes and has already been incorporated into the Sheep Flock Improvement Program. This project elucidated the heritability of lambing interval and age at first lambing, thus giving producers a tool to select sheep for suitability for accelerated lambing programs and lambing at 12 to 15 months of age.
- Development of a metabolizable protein model for formulating diets: This project represents more progress in developing new knowledge for dietary needs of prolific, heavy milking sheep. This research is directly applicable to both our accelerated lambing meat operations and to our growing sheep dairy industry.
- Somatic cell cloning: This project has further investigated means to improve success rates for cloning. Although the work was done in sheep, it is applicable to other livestock species. It also added knowledge regarding the use of progesterone levels to monitor high risk pregnancies in sheep.
- Freemartins, sex chromosome chimerism and effects on sex determination: This project explored the incidence of sex chimerism and its effect on reproductive development and fertility. As sheep become more prolific, the concern is that reproductive loss due to this phenomenon will become more common. This survey found that in 2 flocks utilizing prolific sheep, over 5% of ewe lambs born co-twin to ram lambs, had some degree of chimerism. Of those followed up, all but one was infertile because of changes to the reproductive tract.

### **BioProducts Research Program**

The goal of the BioProducts Research Program is to fund bioproducts research that will give Ontario agricultural-based companies a competitive advantage in global markets and support more environmentally sustainable production systems for improved quality of life in Ontario. Bioproducts are considered to be all substances including chemicals and fibers produced from agricultural-based renewable resources. Bio fuels are currently excluded from this research program since they are funded elsewhere by OMAFRA.

The first call for letters of intent (LOI's) was issued by the University of Guelph in September, 2004 and three proposals were funded for projects beginning in May, 2005. A further call for LOI's was issued in September, 2005. Four LOI's were submitted and reviewed. Based on that review the committee issued a request for one full proposal. This proposal will be reviewed in the spring of 2006 for possible funding by May, 2006. An additional call for LOI's was initiated in January 2006 and from that four LOI's were submitted and reviewed, two of those LOI's were approved to submit full proposals for the Spring of 2006.

### **Highlights of the BioProducts Research Program**

- In the production of novel industrial starches the necessary research tools and biological materials (mutants, recombinant proteins, etc) were set up. Demonstrated the existence of protein complexes between starch synthases and branching enzymes with resulting alterations of kinetic properties of component enzymes.
- Obtained cDNA clones and over expressed functional forms of maize Starch Synthases (SS I, SSII, SSIII) and branching enzymes (BEI, BEIIa, BEIIb) for further studies of protein-protein interactions in the regulation of starch synthesis. Completed back-crossing between available maize mutants, in a waxy-starch background, for production of novel lines of germplasm with altered starch properties.
- Nano micro-fibers from soya hull were obtained. This relatively short fiber is suitable as a filler for consumer goods in building products. Nano micro-fibers from wheat straw were also obtained. These long fibers can be used in many applications like automotive packaging and construction. Utilization of these renewable low-cost supplies of fiber will bring together Ontario's agriculture and process engineering capabilities to produce new composites.
- A collaborative program to launch an Ontario- Illinois resin manufacturing industry from canola oil for auto applications was developed. A strategic partnership between Illinois and Ontario to expand existing starch industry to include thermoplastic starch for automotive application was also developed. Planning for a demonstration facility in Ontario or Illinois to mass manufacture cellulose nanofibre from soy and wheat stalks is underway.
- First biocomposite bridge in the world to be installed this summer at Guelph Arboretum; this bow-string bridge (33 ft long by 7 ft wide by 5 ft high) is made from wood fiber and plastic, and is serving as a prototype for using agricultural fiber in such products.
- Bio active filters from protein-enhanced paper to detect and capture harmful particles are under development. The new filters will feature special proteins that stick to cellulose. These proteins have two parts, one called a cellulose binding domain (CBD) to bind cellulose and the other an antibody to bind pathogens and other contaminants. These filters can improve health and safety for Ontarians.
- One of the major outcomes from the University of Guelph Bio Products steering committee was the decision to focus on a major application for funding of research towards the use of bio composites in the auto industry.
- The University of Guelph is currently inviting applications for the Premier's Research Chair in Biomaterials and Transportation. This is one of the Ontario Research Chairs established by the government to strengthen Ontario's economic advantage and create a culture of innovation. Research focuses on revolutionizing the use of agricultural products in developing novel biofibers, bioplastics,

biocomposites and biofuels for non- traditional industrial uses. Currently the search is underway to find a suitable candidate.

## **Plant Research Program**

All plant program projects ended on April 30, 2006. Final reports were reviewed by the Research Program Director and by the OMAFRA Research Analysts. All research reports were deemed to be satisfactory. The Plant and Animal programs have now been replaced with the new Sustainable Production Systems Program (SP2). The program was developed following the strategic direction of the Agricultural Research Institute of Ontario (ARIO) as identified by a Sustainable Production Systems Advisory Panel. The Sustainable Production Systems Program involves the transformation of the commodity-based Plant and Animal Programs to an integrated issues-based research program.

In September 2005, a call for Letters of Intent (LOI's) for the new Sustainable Production Systems Program was issued with a due date of November 1, 2005. In all, 32 LOI's were submitted. These LOI's were reviewed by a committee in November, 2006 and a call for full proposals was issued for 19 proposals, due for submission on March 1, 2006. These proposals were reviewed by a committee and also subjected to a full science review. Successful projects were funded by May 1, 2006. Accountability is maintained at each stage in the process through monitoring and evaluation of project progress on an annual reporting basis.

## **Highlights of the Plant Research Program**

- Saturated fats have been reduced to less than 4% in University of Guelph canola breeding lines. These provide healthier oil for human consumption.
- Taste testing of soymilk produced from the soybean lines with low linolenic acid and no seed lipoxygenases showed that they were significantly preferred over soymilk from conventional soybean varieties. Gene-specific markers, identified for these traits, can accelerate and simplify breeding lines that are resistant to oxidative degradation.
- Several genetic loci, previously unreported, that are associated with individual (genistein, deidzein, glycitein) or total isoflavone content in the soybean genome have been identified. The marker information is used in the development of high isoflavone varieties for Ontario producers and has been used to select some high isoflavone varieties to be released to the seed industry in 2006/2007.
- Soybean cyst nematode (SCN) resistance breeding has identified novel genes for horizontal resistance from the wild progenitor of soybean, *Glycine soja*. These genes can be utilized in both the private and public soybean breeding programs to improve resistance to the most important pest of Ontario soybeans.
- Rotation may have a greater impact on soil organic matter levels than tillage system in Ontario. Reduced tillage systems did not increase organic matter levels in a long-term trial. Cover crops may reduce losses of nitrogen from fall-applied manure through nitrogen uptake and soil moisture reductions.
- The University of Guelph (Ridgetown Campus) has provided Ontario farmers with two soft red winter pastry wheats, a soft red specialty cracker winter wheat, a high quality hard red spring bread wheat and a very lodging tolerant oat cultivar.

- A number of improved soybean varieties were developed and recently released. These include some novel and unique lines of benefit to the industry including lines with soybean cyst nematode resistance, with export quality seed traits and with industry-leading yield performance.
- In corn germplasm development, 34 Ontario-adapted white food grade inbred lines and 15 short-season yellow dent inbred lines were developed and released.
- Novel mutagenesis and *in vitro* selection protocol was developed to identify specific valuable antioxidants in herbs. Herbs were identified with elevated levels of active ingredients that may be useful in nutraceutical remedies.
- Riboflavin (vitamin B<sub>2</sub>) applied exogenously to strawberry fruits after harvest, increases the anthocyanin coloration of the fruits. This allows processed strawberries to be supplemented with the vitamin and allows the colour to be enhanced.
- Compost and mushroom cultivation processes are efficient in breaking down pesticides present in the make-up materials. Odours produced by the composting process are lowered through forced aeration.
- Biological and biorational control of flies have reduced the need for stronger less environmentally friendly chemicals in mushroom production.
- Container crops grew as well as, or better, with recycled than with non-recycled liquid nutrients, while reducing nitrogen use by 80%. Savings of other nutrients were in the same order of magnitude. With few exceptions, crops fertigated with liquid nutrients (recycled or non-recycled) also grew better than those grown with slow-release fertilizers.
- Carrots are efficient in nitrogen uptake, and remove nitrogen from 30 to 90 cm below the soil surface, which is below the normal plough layer. Carrots can be used as a valuable rotation crop to utilize residual nitrogen in soil.
- Plant Breeders' Rights were granted for two pear cultivars, 'AC Harrow Crisp' (tested as HW610) and 'AC Harrow Gold' (tested as HW616). Plantings of these cultivars for processing are continuing, and the industry goal of 15,000 trees of each should be attained by 2008.
- A PCR-based system for pear cultivar identification has been developed using simple sequence repeat-polyacrylamide gel electrophoresis.
- Nutrient solution concentrations typically used in commercial greenhouses, for both potted gerbera and miniature rose production, can be safely reduced by 50%, without adversely affecting crop production. This has application for other crops.
- It is feasible to improve greenhouse vegetable production under low light by supplementing the hydroponic solution with sugars.
- A genetic trait has been identified that eliminates extended photoperiod injury in tomato, and the physiological basis for extended photoperiod injury in tomato is nitrite accumulation in the leaf. These findings have the potential to make supplemental lighting of greenhouse tomatoes economically feasible.
- Elite germplasm lines have been selected for *Echinacea purpurea* L. on the basis of phytochemical profile, antioxidant potential and capacity for growth and regeneration. These elite germplasm lines

will form the core collection for the development of novel varieties with enhanced phytochemical yield.

- Controlled environment production systems have been developed and optimized for production of medicinal metabolites. Bioreactor systems have been developed for large scale production of sterile, consistent, high quality Echinacea plantlets.
- Plant Breeders Rights (PBR) has been approved for two European plums, V70034 and V72511 (proposed names are 'Vibrant'<sup>TM</sup> and 'Violette'<sup>TM</sup>). A Japanese plum – with red flesh, a first of its kind from UofG – will be named 'Vampire'<sup>TM</sup>. Also PBR is being applied for two peaches – one mid-season, fresh-market type with excellent quality and one late-season, processing- type with smaller fruit size. Announcements of these varieties will be performed during the forthcoming Centennial celebrations of Vineland Station in 2006.
- Identified fungicides that could be used to control daylily rust which was recently introduced into Canada. These data have been used for minor use registrations.
- Alternatives to synthetic fungicides for turfgrass snow mold control were tested and some products, such as some varieties of radish or mustard seeds were found to significantly decrease the level of disease.
- Microbial agents have been identified that effectively protect roots of hydroponic plants against *Pythium* root rot when applied in the plant nutrient solution. One beneficial microbe that promotes plant vigor, stress resistance and productivity is being commercialized as EndoFine®.
- The 'Triple Therapy' concept of combining multiple modes of action to combat antibiotic resistance in humans has been adopted and modified for use in preventing/managing herbicide resistant weeds in Ontario.
- Combining multiple DNA diagnostic tests allowed for the detection of four different herbicide resistance conferring mutations in one single reaction. It is hoped that such tests could be further improved so that they could be made more user friendly, eventually leading to field-based tests.
- Registrations of weed control products for use on vegetable crops recently obtained include Command 360ME (clomazome) for sweet potato, cucumber, pumpkin and squash, Poast Ultra, a postemergence grass herbicide for snow peas, Callisto for sweet corn and Dual Magnum for use on bell peppers.
- Alternative reduced-risk control agents have been identified through laboratory and field studies for onion thrips, European corn borer, Colorado potato beetle, fungus gnats, onion smut and onion maggot, and the apple insect pest complex that exists in Ontario.
- Onion seed treatments with reduced-risk materials can effectively control onion maggot and onion smut with a reduction in pesticide use of over 97%.

### **Resources Management and Environment (RME) Research Program**

Annual and final reports in the Resources Management and Environment program were reviewed in February by the Research Program Director and the OMAFRA research analyst in February 2006. Three smaller projects were completed this year, Innovation and Technology Transfer in the Ontario Agri-food

and Biotechnology Sectors, Assessing Structural and Functional Responses of Soil and Sediment Microbial Communities to Sewage Sludge and Pharmaceuticals and Corn and Soybean Price Forecasting Models for Ontario. The six large integrated team environmental projects initiated in 2004 continued this year. There was no call for proposals in the program this year. One new project on Environmental Goods and Services was approved as a joint project with the Sustainable Rural Communities program.

- **Environmental Research**

- Incorporation of manure reduced ammonia losses as well as bacteria transport in the fall for low mineral N manure types.
- Water budget and stream flow modeling methods have been improved through the development of a more accurate measure of evapotranspiration and water balance
- A soil moisture observation network has been formed for Ontario
- Four commercially available on-farm deadstock cremation units have been stack tested for a variety of air contaminants
- Variability and timing of weather events were found to be more important factors in crop management than changes in mean growing season conditions
- Improved methods have been developed for watershed modeling to facilitate the study of climate change scenarios
- Barriers to the adoption of beneficial management practices (BMP's) at the farm level have been identified.
- Manure management practices such as pre-tillage, to deal with preferential flow risk to tile outlets and shallow groundwater from application of liquid municipal biosolids do not appear to differ significantly from broadcast or incorporation methods.
- Work continues on evaluation of on-farm anaerobic digestion and composting technologies for treatment of swine manure
- Adopters of on-farm environmental management systems tended to be located closer to urban areas
- The concentration of indicator species *E. coli* in surface runoff and tile drain outflow was reduced if manure was incorporated after application than when it was left on the surface
- Although sheep graze near riparian areas, they do not represent a significant risk of transmission
- Pharmaceuticals are commonly detected in sewage sludge, in soils and in aquatic environments in Ontario, however, effects on soil microbial communities were found to occur at concentrations 2-4 orders of magnitude higher than currently observed concentrations.

- **Agricultural Economics Research**

- Researchers have compared the innovation performance and experiences of the Canadian agrifood sector with the biotechnology sector and with the bioproducts and functional foods sectors with respect to financing issues and policy challenges. Ontario bioproducts firms were found to be lagging behind their counterparts in Quebec.
- An improved price forecasting model has been developed for corn and soybean prices in Ontario
- Although the adoption of reduced tillage production systems has the potential to make a significant contribution to net greenhouse gas emissions in Canada, producers are adopting these practices for reasons other than carbon sequestration
- Examination of the distribution of farm incomes in Canada has shown a surprising amount of variability in net farm incomes within farm size categories defined on the basis of gross sales. This finding suggests that the use of average farm incomes in size categories may not be appropriate indicators for farm policy.
- The effect of demand for grain for ethanol production in Ontario has had an ambiguous effect on local corn prices

- The Department of Food, Agricultural and Resource Economics (formerly the Department of Agricultural Economics and Business) has been selected to lead two national research networks, the Canadian Agricultural Trade Policy Network and the North American Agrifood Market Integration Consortium. The goal of the Canadian Agricultural Trade Policy Network is to improve the economic performance of the Canadian agricultural sector through research aimed at improving our understanding of trade policy options. The goal of the North American Market Integration Consortium is to promote interaction among policy makers, business leaders and researchers on integration issues involving agriculture in the NAFTA countries.

### **Food Research Program**

The integrated food/nutrition program has now completed its second year. This program consists of multidisciplinary projects encompassing collaboration between University of Guelph faculty in six departments, Health Canada, AAFC, six other Canadian universities and four international universities from the UK and USA. Food research was conducted mainly at the U of G's Guelph campus and the U of G's Laboratory Services and the Guelph Food Technology Centre continued to provide increasing research services to industry. The program is based on three research priorities, 1) Food Nutrition and Health (Nutraceutical and functional foods), 2) Food Safety, Traceability and Assurance and 3) Food Quality, including value-added opportunities and waste management. Seven projects were approved in 2004 and this is the second year of reporting. Overall, the milestones of all projects met their original objective; however, some projects have faced some slight delays. In these cases, the researchers have been asked to submit interim reports, due September 2006, these reports will be reviewed by the Director of the Food Research program and by an OMAFRA analyst who will determine if these projects should continue.

One conventional project in the Food program was completed this year, and another project will be completed in April, 2007.

### **Significant research outcomes are highlighted below**

- Isolation and characterization of the enzymes of the anaerobic respiration pathway in cold-sensitive and cold tolerant potato tubers has been conducted. The cold-tolerant tubers showed an approximate 2 fold lower enzyme activity of pyruvate decarboxylase (PDC) at the storage temperature of 4°C. Differences were observed in the isozyme profiles of alcohol dehydrogenase (ADH) and lactate dehydrogenase (LDH) between cold tolerant and cold sensitive varieties. The gene expression levels of ADH, LDH and PDC increased to a greater extent in the tolerant variety. These results show that these enzymes are the target for molecular modification for low temperature sweetening tolerance in potato. This project has implication to develop new potato varieties that can withstand low storage temperature, either by genetic transformation or by selection through breeding. The new varieties developed can be stored for longer durations in low temperature without the loss of processing quality.
- Salmonellosis is a human health concern, and the prevention of *Salmonella* colonization of chickens, like *S. typhimurium* is important to poultry as well as to public health. Moreover, chickens may represent a reservoir of *Salmonellae* that can potentially infect humans, and are responsible for the majority of acute cases of human gastro-enteritis. The administration of only 7.5 % (w/w) of non-immunized egg yolk powder was found to prevent *S. typhimurium* colonization in laying hens with no adverse effects. The egg supplement has a novel function to prevent pathogen infection. Ensuring food safety is now a top research priority in Canada and our results; definitely contribute to increasing the safety of Ontario poultry/egg products.

- Safety assessment of novel foods (nutraceutical, functional and GM foods) is an emerging issue in the Ontario agri-food industry. An animal model for major food allergens (peanut and egg ovomucoid) has been successfully established in Guelph and it is useful for genomic and proteomic approaches to develop specific biomarkers for food allergy. Using Affymetrix arrays, 56 up regulated and 37 down regulated genes were identified in the spleen of ovomucoid challenged mice. Out of 34 genes mapped to known biological pathways, five genes have been previously associated with allergy and are good candidates for biomarkers. Differential gel electrophoresis that allows simultaneous quantitative analysis of control and treated samples on the same gel has been successfully established in Guelph. Analysis of ovomucoid challenged mice revealed several statistically significant down regulation of a number of proteins. These results propose novel proteome and transcriptome profiling technologies for rigorous assessment of potential allergenic effects of novel foods in animal models.
- The triad of obesity-type 2 diabetes-cardiovascular disease (CVD) is a serious and growing health issue in Ontario. There are no significant negative health effects of any of the breads (whole wheat and white bread, total carbohydrate ranged from 43% and 53%, respectively) and some breads (specifically whole wheat breads) appear to be considerably healthier than others. Studying the impact of low carbohydrate (CHO) on human health is on going. The results showed that it is superficial to base a health assessment of a food product; such as bread, on only the measure of glycemic index (i.e. the blood glucose response), the different breads can have very different biomarker responses and hence different impacts on human health and the impact extends beyond the meal in which the bread is consumed.
- The realization of the well studied health benefits of soy isoflavones to society is greatly limited by the inability of consumers to successfully incorporate isoflavones into their daily diets. Breeding of soybeans with higher isoflavone content and the incorporation of those soybeans into food products that consumers will be able to incorporate into their daily diet will address this gap. Three soybean varieties with high isoflavone were identified and these will enable researchers to develop functional breads with an important outcome. This research will add value to the Ontario agri-food sector through increasing the consumption of soy isoflavones using functional foods.
- Pigs are the most relevant large animal models for investigating how functional food ingredients can improve cardiovascular, gut, and immune functions and prevent or reduce chronic diseases in humans. Changes in visceral organ and tissue protein synthetic activities are good indicators of intestinal and visceral infections, inflammation and oxidative stress as measured in the pig models with stable isotope tracers. Several corn starch processing strategies, including steeping temperature, enzymatic de-branching and citric acid treatment, could be used for producing resistant starch from conventional Ontario corn starch as functional food ingredients to help reduce the obesity and cardiovascular related health issues in the society. Anti-oxidative bioactive peptides were isolated from egg yolk proteins. Immunomodulatory bio-active peptides isolated from dairy milk proteins. These bio-active peptide functions have been examined with in vitro cell line models and proven to be functional as expected. Novel bio-active peptides derived created from milk and egg have an impact of immune enhancement and these include optimizing macrophage functions, boosting protection against intestinal infections, and offsetting oxidative damage.
- The adequate intake for dietary fibre in Canada and the United States is 38g/day for men and 25g/day for women. The most recent (2004) North American consumption data shows men with an average intake of 16g/day and women with an average intake of 12g/day. This fibre gap has received much attention in the scientific and popular literature as it has been established beyond question that the inclusion of soluble dietary fibre in the diet results in important health benefits. Fractionating and characterizing flaxseed gum for potential use as a dietary fibre was conducted. Bacterial

exopolysaccharide from fermentation of milk was investigated and the methods for examining protein-polysaccharide interactions have been developed.

- Until recently, the only way to provide structure to an oil, and thus convert it into a fat, was by adding saturated or trans fats. This represents a major problem as it is generally agreed that trans fats should be minimized or eliminated from our diet. A novel vegetable oil/water monoglyceride gel has been proven to work as an edible spread and shown to have beneficial effects towards cardiovascular health. The human feeding trial has demonstrated that encapsulating oil, a macronutrient, within crystalline monoglyceride vesicles will decrease triglyceride loading in the serum. The new spread is calorie reduced (60% lipid) relative to conventional margarine or butter, has a beneficial assimilation profile and is devoid of trans fatty acids.

Initiatives that will further enhance the Food Program:

1. In October, 2005, Nutrigenomics in Guelph (organized by Mars Landing) invited several Food Program leaders from the University of Guelph to give presentations. Approximately 150 people attended this event.
2. Advanced Foods and Materials Network (AFMNet) continue to address three strategic research themes: (1) Structure-Dynamics-Function of Foods and Bio-materials; (2) Functional Foods and Nutraceuticals; and (3) Genetic, Ethic, Economics, Environment, Law and Society. AFMNet hosted their 2<sup>nd</sup> Annual Scientific Conference in Calgary, Alberta early May/06. This NCE project is closely linked to the New Integrated Food Research Program with many researchers from the University of Guelph's Food program continue to work closely with AFMNet investigators.

### **Sustainable Rural Communities (SRC) Research Program**

The 2005/06 research year was highly successful for the Sustainable Rural Communities research program. Several important research projects were completed, three were extended with external funding, and a set of 5 new research projects were initiated in accordance with the research agenda set by the Ontario Rural Research and Services Committee (ORRSC).

Of note in 2005/06, was the transfer of the Rural Development Division from the Ministry of Municipal Affairs and Housing to OMAFRA to support the change in responsibility for Rural Affairs in Ontario. This provided the opportunity to re-link rural research with many of the interests of agriculture especially in the area of land-use and community planning.

An important innovation was the initiation of a series of short-term research projects commissioned by the Rural Development Division on topics of policy importance (the Contribution of Agriculture to GDP (Gross Domestic Product) in Ontario, Rural Immigration in Ontario, The Development of Rural Wind Generation Policy for Farm and Rural Communities).

The most outstanding project was the Innovative Rural Communities project which combined the resources of the University with the creative resources of three independent research consultants. From an initial investment by SRC of \$12,000 pa, the project attracted over \$260,000 in external funding from public and private sources over a three year period. The discovery of the nature of rural innovation to be both process and product orientated has been important. The resultant tool kit being developed for community engagement in promoting rural innovations has also been very popular and can be accessed on line. This research, which developed from idea to dissemination in three years, is an excellent example of strategic investment of public resources.

**Table 1.1.1: Research Projects Conducted in 2005/2006 and Approved for 2006/2007**

|                                                    | 2005/2006                               |                                          | 2006/2007                                               |                             |                                                            |
|----------------------------------------------------|-----------------------------------------|------------------------------------------|---------------------------------------------------------|-----------------------------|------------------------------------------------------------|
| <b>Programs</b>                                    | <b># Projects Active <sup>(1)</sup></b> | <b># Projects Completed</b>              | <b># Proposals Received</b>                             | <b># Proposals Approved</b> | <b># Projects Active</b>                                   |
| Animals <sup>(2)</sup>                             | 181 <sup>(3)</sup>                      | 92                                       | 0                                                       | 0                           | 96 <sup>(4)</sup>                                          |
| Plants <sup>(2)</sup>                              | 65                                      | 63                                       | 0                                                       | 0                           | 0 <sup>(5)</sup>                                           |
| Sustainable Production Systems                     | N/A                                     | N/A                                      | 20<br>(incl. 18 SP2 Call;<br>2 SP2 Tier II Submissions) | 20                          | 22<br>(incl. 7 Tier I,<br>* 13 Tier II, 2 Plant Transfers) |
| Resource Management and Environment <sup>(2)</sup> | 13                                      | 3                                        | 0                                                       | 0                           | 10                                                         |
| Food <sup>(2)</sup>                                | 8                                       | 1                                        | 0                                                       | 0                           | 7                                                          |
| Sustainable Rural Communities                      | 7                                       | 8 <sup>(6)</sup><br>(incl. 4 short term) | 7<br>(incl. 4 short term)                               | 7<br>(incl. 4 short term)   | 6                                                          |
| Bioproducts                                        | 4                                       | 1                                        | 7 LOI **                                                | 1                           | 4                                                          |
| <b>Total</b>                                       | <b>278</b>                              | <b>168</b>                               | <b>34</b>                                               | <b>28</b>                   | <b>145 <sup>(4)</sup></b>                                  |

<sup>(1)</sup> 'Active' refers to all projects being funded in the specified year and includes new projects (started in that fiscal year) as well as continuing projects (initiated in previous fiscal years).

<sup>(2)</sup> No Call for Proposals in Animal, Resource Management & Environment or Food Programs, therefore accounting for lower number of active projects.

<sup>(3)</sup> Total does not include 5 terminated projects (1 Beef, 1 Equine, 3 Pork) and 2 projects that are on hold (1 Aqua, 1 Plant) and ultimately not approved.

<sup>(4)</sup> Total includes 2 extensions from maternity leaves and 5 additional Equine projects with animal use only.

<sup>(5)</sup> Plant program ended April 30, 2006. Two continuing plant projects transferred to SP2 Research Program.

<sup>(6)</sup> Call for Proposals in Sustainable Rural Communities in Feb. 2006, for short term projects; 4 submitted, 4 approved and 4 completed between Feb-Mar 2006.

\* The 13 active Tier II projects in the Sustainable Production Systems Program are a compilation of 11 projects initially submitted for Tier I consideration and accepted as Tier II projects, plus 2 additional Tier II projects submitted and accepted in August 2006.

\*\* Bioproducts LOI timelines: Nov. 05 – 3 LOIs submitted; Dec. 05 – 2 not approved, 1 request for full proposal; Mar. 06 – full proposal not approved, 4 LOIs submitted; May 06 – 2 LOIs not approved, 2 requests for full proposals; June 06 – 1 full proposal approved.

## 1.2 Research Program Performance Measures

Table 1.2.1: This Table lists the Performance Measures in the order shown in the Agreement and the results. The general areas addressed and the specific outcomes expected are described in the 'Objective' and 'Measure/Activity' columns (slightly abbreviated versions on the full wording in the Agreement).

| Objective                     | Measure/Activity                                                                                                                                               | Result                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1, A,B,C<br>Priorities        | OMAFRA-identified<br>Research Priorities are met.                                                                                                              | Research Program priorities were met.<br>New integrated issues-based, 'value chain' research proposals were implemented within Bioproducts Research Program, with a further call for letters of intent (LOI) and proposal for projects to start in fiscal 2006/2007. Likewise LOI and full proposals were solicited for the Sustainable Production Systems (SP2) Program, aimed for implementation in May 2006.<br>Approx one half (92) projects in the Animal program were completed, with the balance (96 projects) to be completed by April 2007. The Animal program funding from the completed projects was transferred to the Bioproducts program and the new SP2 Program.<br>The Plant Program was terminated as of April 30, 2006 since the vast majority of projects were completed as of this date. (A few were transferred over to the SP2 program where they will be completed in the next year or so. Funding from the Plants program was transferred to the Bioproducts and SP2 Programs. |
| 2, A,B,C<br>Reporting         | Delivery on time and within budget<br>A and B. 95% of projects completed on time and within budget.<br><br>C. Meet 90% of milestones for projects in progress. | A and B. A total of 138 Final Reports for projects were submitted, 100% were on time; however, 19 (14%) were over budget. Some of these projects were balanced shortly after the deadline. Arrangements have been made to bring all completed projects to a zero overspent balance (by transferring expenses to related trust fund research revenues). The balance of Final Reports (30) will be submitted closer to the end of the fiscal year, since all project activities were not completed as of January 15 <sup>th</sup> .<br><br>C. 90% of milestones for projects still in progress were met.                                                                                                                                                                                                                                                                                                                                                                                                 |
| 3<br>Animal Care<br>Standards | Meet or exceed Animals for Research Act and Canadian Council on Animal Care Standards                                                                          | Animals for Research Act and Canadian Council on Animal Care Standards were met.<br>The OMAFRA Minor Capital program provided approximately \$1.0 million in 2005/06. This funding was spread across all OMAFRA stations and regional campuses in support of 70 projects to address priority animal care, health and safety, code compliance and some critical equipment deficiencies.<br>A comprehensive 5-yeaer plan for investment of Capital Program funding was developed, to prioritize spending on these deficiencies over the coming years.                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

| Objective                                         | Measure/Activity                                                                                                | Result                                                                                                                                                                                                                                                                                                                          |                                                                           |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|
| 4, A,B,C<br>Funding from<br>non-OMAFRA<br>Sources | A. Annually increase<br>funding from non-<br>OMAFRA sources for<br>research related to the<br>OMAFRA Agreement. | Total Non-OMAFRA<br><u>Funding for Research</u>                                                                                                                                                                                                                                                                                 | Portion of Non-OMAFRA Funding for<br><u>Research Related to Agreement</u> |
|                                                   |                                                                                                                 | (\$million)                                                                                                                                                                                                                                                                                                                     |                                                                           |
|                                                   |                                                                                                                 | 2005/2006: 110.9                                                                                                                                                                                                                                                                                                                | 66.9                                                                      |
|                                                   |                                                                                                                 | 2004/2005 90.9                                                                                                                                                                                                                                                                                                                  | 58.0                                                                      |
|                                                   |                                                                                                                 | 2003/2004: 86.0                                                                                                                                                                                                                                                                                                                 | 54.7                                                                      |
|                                                   |                                                                                                                 | 2002/2003: 69.5                                                                                                                                                                                                                                                                                                                 | 42.7                                                                      |
|                                                   |                                                                                                                 | 2001/2002: 69.2                                                                                                                                                                                                                                                                                                                 | 38.5                                                                      |
|                                                   |                                                                                                                 | 2000/2001: 61.5                                                                                                                                                                                                                                                                                                                 | 35.3                                                                      |
|                                                   |                                                                                                                 | 1999/2000: 52.0                                                                                                                                                                                                                                                                                                                 | 36.8                                                                      |
|                                                   |                                                                                                                 | 1998/1999: 38.0                                                                                                                                                                                                                                                                                                                 | 23.8                                                                      |
|                                                   |                                                                                                                 | Details of the University's research funding are found at <a href="http://www.uoguelph/research/summaries">www.uoguelph/research/summaries</a> . Non-OMAFRA funding for research related to the OMAFRA/U of G Agreement increased by 15%.                                                                                       |                                                                           |
|                                                   | B. Annually increase<br>research funding from<br>business and industry<br>sources.                              | B: Business and industry support increased by \$0.5 million from the previous fiscal year.                                                                                                                                                                                                                                      |                                                                           |
|                                                   |                                                                                                                 | 2005/2006 \$14.9 million                                                                                                                                                                                                                                                                                                        |                                                                           |
|                                                   |                                                                                                                 | 2004/2005 14.4                                                                                                                                                                                                                                                                                                                  |                                                                           |
|                                                   |                                                                                                                 | 2003/2004 16.1                                                                                                                                                                                                                                                                                                                  |                                                                           |
|                                                   |                                                                                                                 | 2002/2003: 16.4                                                                                                                                                                                                                                                                                                                 |                                                                           |
|                                                   |                                                                                                                 | 2001/2002: 16.4                                                                                                                                                                                                                                                                                                                 |                                                                           |
|                                                   |                                                                                                                 | 2000/2001: 15.4                                                                                                                                                                                                                                                                                                                 |                                                                           |
|                                                   |                                                                                                                 | 1999/2000: 12.2                                                                                                                                                                                                                                                                                                                 |                                                                           |
|                                                   |                                                                                                                 | 1998/1999: 12.0                                                                                                                                                                                                                                                                                                                 |                                                                           |
|                                                   |                                                                                                                 |                                                                                                                                                                                                                                                                                                                                 |                                                                           |
|                                                   | C. Report non-OMAFRA<br>funding for infrastructure                                                              | C: Awards were received in 2005/06 for \$2.95 million in non-OMAFRA funding for research infrastructure related to the OMAFRA Research Program objectives. These awards were combined CFI (Canadian Foundation for Innovation), OIT (Ontario Innovation Trust) awards and matching contributions. Refer to page 79 for details. |                                                                           |
|                                                   |                                                                                                                 |                                                                                                                                                                                                                                                                                                                                 |                                                                           |

| Objective                    | Measure/Activity                                                                                                      | Result                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5<br>Intellectual Properties | Annually increase the number of licenses, patents and royalties.                                                      | <p>In 2005/06, there were 126 germplasm disclosures (new cultivars, hybrids or non-seed propagules) comprised of 2 barley, 1 oat, 5 wheat 23 maize, 34 soybean, and 61 tomato varieties. In 2004/2005 there were 82 disclosures (16 maize, 46 soybean and 20 alfalfa). Eleven non-germplasm disclosures made in 2005 (compared to 7 in the previous year) were related to OMAFRA funding. These included genetic markers for boar taint (3) increasing or controlling pungency in alliums (2), isolation of DHA producing bacteria, a natural health product, a viral vector, methods for predicting crop stress tolerance, increasing the shelf life of fresh flowers and making paper bioactive for capture of pathogens or impurities.</p> <p>OMAFRA had an interest in 13 of the 26 new patent applications filed by the University in 2005/2006. As of year-end 2005/06, there were 43 OMAFRA-Program related patents held by the University, with 18 of these being licensed. (This is a significant drop from the 39 licensed patents reports a year ago. The drop is due primarily to an optionee cancelling their option on the licenses.)</p> <p>Further details can be found in the Intellectual Properties section beginning on page 80.</p> |
| 6<br>Royalties               | Increased combined seed and technology royalties by an average of 5% per annum over the 5-year term of the Agreement. | <p>Although royalties for germplasm and non-germplasm releases were down in 2005/2006 (totalling \$676K, compared to \$709K the previous year), when the one-time collection in 2004/2005 of \$122K in royalties unpaid over several years is eliminated, the remaining royalty revenues grew by 15% over the previous year.</p> <p>Germplasm royalties were collected on 137 plant cultivars in 2005/2006 – 54.8% on soybeans, 11.9% on cereals, 10.3% on maize, 8.8% on white bean, 2.4% forages, 2.2% on asparagus, and small amounts on a number of other species (canola, apple rootstock, strawberries, tree fruits).</p> <p>Royalties were received on 8 non-germplasm technologies in 2005/2006, primarily from a cattle vaccine and a milk technology.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Objective                                                                     | Measure/Activity                                                                                                                                                                                                                                                                                                                                                                           | Result                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7, A,B<br>Reporting                                                           | <p>A. Submit 4-year program reports at appropriate time and submit changes to research programs by Feb. 15 of each year.</p> <p>B. Report to OMAFRA by Feb 15 on 95% of OMAFRA projects in their final year.</p> <p>C. Annual summary reports to be submitted to OMAFRA by Feb. 15 on each project completed or in progress, in a form which can be readily communicated to the public</p> | <p>A. In 2004/2005 an extension was granted for the Animal Program, with some projects being accepted or extended for either 1 or 2 years duration. The Animal Program Report will be prepared following the April 2007 completion of all Animal Program projects. Following completion of the 4-year term of the Plants Program in April 2006, a 4-year program report will be prepared in accordance with OMAFRA/ARIO needs.</p> <p>B: The target of reporting to OMAFRA by Feb. 15 on 95% of the OMAFRA projects in their final year was met. 139 annual reports were submitted of which 99% were received by Feb 15<sup>th</sup>.</p> <p>C: All annual and final project reports received were submitted to OMAFRA in time for preparation for the Research Review Committees' meetings, the majority of which occurred in February. Researchers are asked to provide, in a form free of non-disclosed information, a summary of results and progress against milestones, and in addition in the case of final reports, their conclusions and the significance of the research to the Ontario agri-food sector.</p> |
| 8<br>Scientific<br>Productivity                                               | <p>Maintain or increase the annual number of:</p> <p>A: Peer-reviewed journal publications (Target: &gt;300)</p> <p>B: Presentations at scientific conferences (Target: &gt;400)</p>                                                                                                                                                                                                       | <p>There were 373 peer-reviewed journal publications reported, compared to 352 in the previous year. In addition, there were 392 books or chapters in books published, compared to 203 in 2004/05. Values reported are for publications dated in the calendar year, so the 2005/06 report is for publications in 2005.</p> <p>The total number of presentations at scientific conferences reported was 811, compared to 562 in the previous year.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 9<br>Communication<br>of results to<br>stakeholder or<br>industry<br>audience | <p>Maintain 2003/04 levels for the combined total number of:</p> <p>A. Presentations in the media</p> <p>B. On the internet</p> <p>C. At stakeholder or industry meetings</p>                                                                                                                                                                                                              | <p>A: 179 articles in the popular press, compared to 192 a year ago. Many of the popular press articles are now written by SPARK writers after interviewing faculty, so the faculty are not the authors (see Media section).</p> <p>B: There were no new presentations on the internet. Almost all the faculty involved in the Agreement have their own web pages. The total is &gt;300.</p> <p>C: There were 411 presentations to stakeholder or industry meetings, tours, etc. compared to 518 reported in 2004/05. Our reporting of these data is becoming more refined on a yearly basis.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 10<br>Expert<br>Contribution                                                  | <p>Maintain the number of committee commitments year to year</p>                                                                                                                                                                                                                                                                                                                           | <p>There were 678 (to be verified for duplication) memberships on provincial, national and international committees reported for 2005/06, compared to 296 reported for the previous year. Our reporting of these data is becoming more refined on a yearly basis.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Objective            | Measure/Activity                                                            | Result                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11<br>OASIS Database | Complete a thorough review of research database needs                       | During 2004/05, the UofG initiated a plan for a new, comprehensive database to support the OMAFRA Research program, which will ultimately allow the University to replace the OASIS database which is outdated and housed on unsupported software. The planned database will also support data collection and management for other research funding and program/animal care training and protocol tracking capabilities and will be constructed on a web-based interface which will streamline project entry, updating and reporting procedures by researchers. Initial development work on this database was undertaken in 2004/05. Progress has continued in 2005/2006 but has been slow due to limited dedicated resources for the task. This issue has been identified as critical to the operation of several aspects of the Office of Research, and thus is expected to garner additional resources in the coming year. |
| 12<br>Impact         | Identify a method of measuring impact and submit to the Executive Committee | This PMA was addressed in year one of the current 5-year agreement, through the provision of a 'research impact analysis' study that demonstrated the typical methodology of such studies (as reported on in the 2002/03 Annual report). OMAFRA has since expressed their interest in exploring a separate evaluation of the impact of the research undertaken through the OMAFRA / U of G Agreement. Some specific examples of research with significant impact are provided in the Highlights of Research Accomplishments in this Annual Report.                                                                                                                                                                                                                                                                                                                                                                            |

## **2. Education Program**

### **2.1 Diploma Education**

**Alfred Campus, Guelph Campus, Kemptville Campus, and Ridgetown Campus**

#### **2.1.1 Overview**

The educational programs offered through the Agreement between the Ontario Ministry of Agriculture, Food and Rural Affairs and the University of Guelph are diverse in format, targeted in direction and rich in quality and substance. They include the traditional 2 or 3 year diploma programs, one-year certificates, apprenticeships and single or multi-day training opportunities. The programs are delivered across the province in both official languages.

A significant change in 2005/06 was the adoption of the title “campus” by each of the regional colleges. This exemplifies their evolution into the role of regional centres of innovation and university-level teaching and research, while maintaining our commitment to skills training and lifelong learning which are key parts of the traditions of each of the campuses, including OAC at Guelph.

In 2005/06, enrolment in the diploma programs stabilized, increasing slightly. Only at Campus d’Alfred were enrolments disappointing, but through new curricula and stronger community support, we have reason to expect that student numbers will grow significantly at that campus from 2007/08.

The quality of these educational programs was again vividly illustrated through student awards and accreditation/articulation agreements. In 2005/06 there was a significant increase in awards and scholarships made available to students by the industry. This includes the transfer of several awards previously provided to diploma students in Guelph, but now generously transferred by the donors to the Regional Campuses. Accreditation of our diploma programs by industry associations continued to expand and now includes the Food, Nutrition and Risk Management diploma (process ongoing). Several new articulation agreements have been finalized or are being developed including agreements with Université Laval, Olds College in Alberta and Purdue University.

Attrition rates remain similar to previous years and employment statistics of graduates remain very strong with several programs reporting 100% placement shortly after graduation.

Kemptville Campus successfully introduced a new Co-op Diploma in Agricultural and Heavy Duty Equipment for 2005/06 with 24 students. Operationally, this program is self-funded, but maximizes the use of facilities and equipment provided through the OMAFRA/UofG Agreement to fill an identified need in the industry.

All regional campuses reported significant increases in Business Development & Training activities. Total training increased by more than 10,000 students’ days, an increase of 90 diploma student equivalents. All of these programs are very targeted in nature and include specialized certificates, apprenticeship programs and provincially or federally mandated training programs. These activities provide significant leverage for the OMAFRA/UofG Agreement to broaden the reach of these programs.

## **2.1.2 New Initiatives**

### **Campus d'Alfred**

#### **1. Curriculum Reform**

A working group evaluated and revised the offering of courses and specializations in the Agriculture diploma program. Based on those recommendations, key curriculum-based modifications will take place, effective September 2007. Fall 2006 will represent the transition year and the new structure will be completed for fall 2007. These changes have been well received by the community and by industry and we are confident they will lead to improved quality within the program, and to increased enrolments, our goal is to grow to at least 150 students at the Associate Diploma level with the new curricula.

#### **2. Accreditation**

The Food, Nutrition and Risk Management (FNRM) diploma coordinator and the program dietician have participated in the review and validation of the accreditation standards for the Canadian Society of Nutrition Management (CSNM) which were finalized in October 2005. The FNRM program is presently undergoing an accreditation process with submission of the dossier in July 2006. The CSNM accreditation team is scheduled to visit on October 2-3, 2006. Following the conditional accreditation of Campus d'Alfred by Ontario Association of Veterinary Technologist (OAVT) as a new site offering the Veterinary Technician diploma, a dossier was submitted for full accreditation. The visit of the OAVT accreditation team is planned for the fall 2006.

#### **3. Articulation with Université Laval**

New articulation agreements into the Bachelor in Agronomy and the Certificate in Horticulture and Green Space Management were formalized with Université Laval during the summer 2005. Students in the Agriculture, Environmental Management and Veterinary Technician diploma programs offered at Campus d'Alfred will benefit from these agreements.

### **Guelph Campus**

#### **1. Distance Education expansion**

A number of new course offerings are under development by the Office of Open Learning to increase Horticultural and Turf Management on-line certificate courses. It is expected that a number of these courses will be available to diploma students as elective credits or to make-up missed credits in the on-campus program.

#### **2. New Faculty**

Dr. Katerina Jordan, a new faculty member in the Department of Plant Agriculture, was hired in 2005. Dr. Jordan has a teaching role within both the Turf Managers Course and the Associate Diploma in Turf Management program.

### **Kemptville Campus**

#### **1. Co-op Diploma**

A new Co-op Diploma in Agricultural and Heavy Duty Equipment began with 24 students, 3 of these electing to earn the one year certificate in the Diesel Equipment Mechanic program. This program is self-funded through tuition and industry support.

## **2. New Faculty**

Dr Katrina Merkies, a new faculty member in the Department of Animal & Poultry Science, was hired in 2006. Dr. Merkies will have a teaching role within the Agriculture diploma program, and her expertise will strengthen applied research in equine science.

## **3. Program Efficiencies**

In the 2005/06 academic year several Horticulture Diploma courses were combined with Level 1 & Level 2 Horticulture Apprenticeship courses. Horticultural Diploma students in courses like Business Management and Human Resource Management have been integrated into Agriculture Diploma splits. These changes have helped to minimize the cost per student in the Diploma programs and have provided the critical mass of students to run Diploma courses. As a result, there was an intake of 11 junior students in the Horticulture program for fall 2005.

## **4. Academic Partnerships**

Academic partnerships continue to benefit us with the promotion of our programs. A pilot program; REALS (Reconnecting and Engaging through Apprenticeships and Local Skills), was developed in collaboration with the Upper Canada District School Board, the Catholic District School Board of Eastern Ontario and the Ontario Youth Apprenticeship Program coordinators for this region. This program is part of an initiative of the provincial government to keep youth in school until they are 18 years old. It has been promoted in all the high schools within each school board and has increased the visibility of Kemptville College. In fall 2005 and spring 2006, REALS brought groups of 6, then 20 senior high school students to the Kemptville Campus, followed by 87 grade 10 students and 45 students from grades 7 and 8. These numbers indicate potential for increasing enrolment.

## **Ridgetown Campus**

### **1. Classroom and student recreational facilities expanded**

The Rudy H. Brown Rural Development Centre was constructed in 2005/06 and, due to the tremendous financial support from the Province of Ontario, alumni and industry, will open in the fall of 2006 to the delight of new and old Ridgetown students. The facility will house four classrooms and a large auditorium/gymnasium, the latter not seen at this campus since the first buildings were erected in 1922. This will significantly improve our capacity to offer quality educational experiences at Ridgetown.

### **2. Laboratory Technician Diploma**

In response to numerous inquiries from local industries, Ridgetown is investigating the feasibility of introducing a new Diploma program with a focus on laboratory techniques. A curriculum has been developed with the assistance of industry representatives, and should be available for 2007/08.

### **3. Distance Education (DE)**

Last year was the first offering of Distance Education packages developed through the Office of Open Learning. A substantial number of students took courses in Greenhouse Management, Introduction to Landscape Construction, Landscape Design, Horticultural Weed Management and Golf Course Weed Management. Ridgetown attempted to introduce a “blended” DE course offering in Greenhouse Management with the lectures being delivered through the DE (computer) format along with the laboratories being offered face to face. Students liked the material but preferred the face to face course offerings as in the past. Students who have taken the time and expense to attend the campus have indicated a desire to have full access to the teaching staff while those that have chosen DE or are not able

to become resident students were pleased to access the instructor through their computer links.

#### **4. New courses introduced**

Ridgetown not only continues to upgrade existing courses but also continues to evaluate and introduce new courses where appropriate. The new course offerings include Tree Care Techniques, Advanced CAD Graphics, Horticulture Equipment Management, Applied Landscape Construction and Organic Agriculture.

#### **5. New Externship in Environmental Management**

Building on the 4-week externship programs offered to the Veterinary Technology and Veterinary Medical Office Administration (VMOA) certificate students, we have added a once a week full day externship program into the Environmental Management Diploma program. As part of the Sampling and Analysis course students spend a full day at sewage treatment facilities or other appropriate businesses where they learn “on the job” skills. This has been extremely beneficial with many industries offering employment to successful students at the time of graduation. This format will be introduced into both the Horticulture and Agriculture diploma programs in the future.

#### **6. Dairy Barn Management Skills**

A new experiential learning course was introduced this year to “great praise” by both students and industry partners. The course was offered initially to 12 students in the fall and was repeated again in the winter semester due to student demand. This course allows for the integration of classroom knowledge to be implemented immediately as an applied learning opportunity.

### **2.1.3 Diploma Education Programs – Update**

#### **Campus d’Alfred**

For Campus d’Alfred, September 2005 ushered in an historical accomplishment as the 25th intake of diploma students arrived on campus. This included both the second intake of students in the Food, Nutrition and Risk Management diploma and the second year class who launched the program in 2004.

Campus d’Alfred has participated actively in the discussions at the Provincial Diploma Programs Committee for the development of Learning Outcomes and Element of Performance for the different diplomas offered at OAC.

#### **Guelph Campus**

The Associate Diploma in Turfgrass Management program continues to grow in local, national and international interest. In 2005/06 the first international student, an Australian, graduated from the program. As well, the first student from Europe was admitted to the first year of the program. Students continue to seek a wide range of opportunities during the required summer work internship with students being placed at turf management operations in Quebec, Ontario, Alberta, British Columbia, New Jersey, Pennsylvania and Scotland.

The 2005 graduating class had an unusually high attrition rate which can be attributed to students who withdrew from the program for health or personal reasons as well as a number of students who elected to

take an additional year to complete the program. Ten students from this class plan to return to complete their studies in 2006/07. As a result we anticipate a larger than normal graduating class in the winter and summer convocations of 2007.

## **Kemptville Campus**

There were a total of 217 students enrolled in the OMAFRA-funded Diploma programs at Kemptville in the 2005/06 academic year. Enrolment in the Agriculture Diploma was 167 students, of which 83 were in the equine option. A number of students transferred from one program to another (1 graduate from the Horticulture Diploma and 4 graduates from the Agriculture Equine Option transferred into the Agriculture Diploma (general). Food Nutrition and Risk Management Diploma students numbered 39. Due to the fact that there was no junior Horticulture Diploma intake in 2004 and a revival in 2005, the total number of Horticulture Diploma students was 11. A new Co-op Diploma in Agricultural and Heavy Duty Equipment (not funded by OMAFRA) began with 24 students, 3 of these electing to earn the one year certificate in the Diesel Equipment Mechanic program. Thus the total number of diploma students was 241.

Kemptville College received funding through the Eastern Ontario Development Fund to hire a Recruitment Officer starting September 2005. The first recruitment officer, a 2005 Kemptville graduate, worked for about one year and has been replaced by an award-winning 2006 Kemptville graduate. A significant effort will be made this year to promote our programs directly to high school teachers in related areas of study and to guidance counsellor in Eastern Ontario schools.

## **Ridgetown Campus**

On May 18th, 2006, a record number of students graduated from University of Guelph Ridgetown Campus. With 198 diploma graduates this was the largest convocation ceremony in Ridgetown's 55-year education history. The record number of graduates is a reflection of program diversification and a testimony to the positive experience students receive at Ridgetown. With agricultural programs across Canada reporting lower student enrolments, Ridgetown's anticipated student intake is predicted to remain high equal to the near record first year student enrolment for the past two year's. Career opportunities continue to be excellent even under the current economic pressures at the farm gate.

The agriculture course offerings at the University of Guelph, Ridgetown Campus are updated annually. Some of the changes to the agriculture curriculum include: making the Agriculture and Environmental Stewardship a core course as recommended by the Agriculture Advisory Committee, adding Viticulture and Oenology, Animal Health, Dairy Cattle Nutrition and Selection, Swine Reproduction and Management, Poultry Production, and Dairy Barn Management courses and revising the Vegetable Crop Pest Management course.

In the Horticultural program plant markers for all material in the Plant Identification I and II courses (about 250 species) were made, and maps developed to assist students with finding plant material to study for exams. These permanent markers are also welcomed by the community who frequent our various gardens on campus. New course offerings in the Horticulture diploma include Tree Care Techniques, Advanced CAD Graphics, Horticulture Equipment Management, Applied Landscape Construction and Organic Agriculture.

The Veterinary Technology Program is currently accredited by the Canadian Veterinary Medical Association (CVMA), Canadian Council of Animal Care (CCAC), Ontario Association of Veterinary Technicians (OAVT) and the facilities are accredited by the College of Veterinarians of Ontario (CVO). We are also the only veterinary technology program in Canada to have American Veterinary Medical Association (AVMA) accreditation. After AVMA received our annual report, we were notified by them that our full accreditation status would continue for 2006. We also had a CVO inspection in 2006, and received full accreditation status for our facilities. In 2005/06 we implemented the first version of the Essential Skills, thereby ensuring all students complete the objectives of the Veterinary Technology program. The documentation required was quite cumbersome and therefore, for 2006/07, a new Essential Skills Booklet was developed and implemented. There have been a number of facility and equipment upgrades required as part of our accreditation status and/or to meet animal care requirements. So in accordance with CCAC, ACC, OMAFRA and AVMA requirements and/or recommendations these upgrades include the need to have additional large cages for dogs; the acquisition of new stalls for horses; new outdoor shelter for horses; a new radiography machine housed in a recently renovated room off of the Rotunda; an LCD projector and computer for junior classroom; and additional books and CD's for the library.

Several students have taken advantage of the “Two Diplomas in Three Years” being promoted by the Ridgetown Campus. By successfully completing their first two years in either Environmental Management or Horticulture and then completing one final academic year in Agriculture, a student can earn two University of Guelph Associate Diplomas in three years which has allowed those students even greater employment opportunities.

Graduating students from Ridgetown have several post-diploma opportunities which lead to degrees. Students can move into degree programs at the University of Guelph campus with significant credits being transferred; as well as, to other institutions beyond Ontario's borders with articulation agreements providing near seamless transitions into other programs. For example; Ridgetown's Veterinary Technology graduates receive their full two diploma education courses as degree equivalents when transferring into the 4-year Purdue University Veterinary Technology degree program. Similarly, articulation agreements with Olds College in Alberta allow our Agricultural graduates to enter as third year students in the Bachelor of Applied Science degrees in Agri-business and our Horticultural graduates have the same opportunities in degree granting programs for Ornamental Horticulture. Further efforts are being made to offer Ridgetown's students opportunities into degree programs throughout North America.

## **2.1.4 Certificate Programs/Apprenticeships**

### **Campus d'Alfred**

A new Certificate in Meat Food Safety is being developed. This distance/residential training program for meat inspectors and meat industry employees who interact with inspectors is under development for OMAFRA and CFIA. The project will be funded by OMAFRA and the Federal Government and includes Olds College in Alberta, Nova Scotia Agricultural College and their provincial ministries. Development is expected to continue through 2006/07 with program implementation scheduled for spring 2008.

The first intake of Apprenticeship students (Horticultural Technician, Level 1) were registered and received training from October 2005 to February 2006 as part of this multi-year program. Campus d'Alfred received approval from MTCU to deliver Parts person pre-apprenticeship program in partnership with La Cité Collégiale. This program will run from June 2006 to February 2007

## **Guelph Campus**

A number of on-line Horticulture and Turf Management certificate courses are offered through the Office of Open Learning. These courses are offered in structured twelve week courses that parallel the on-campus semester schedule. Certificate programs currently offered include:

Sustainable Landscapes  
The Horticulturist  
Creating Landscapes  
Managing Golf Courses  
Growing Plants for Profit

## **Kemptville Campus:**

There were 63 students registered in three full-time one year certificate courses in 2005/06 (Equine Management, Industrial Welding & Fabrication and Food Service Worker Certificate). These programs complement the OMAFRA based diplomas by allowing students to move from one program to another and to have diploma students take courses (for credit or interest) such as; welding and small engines or riding. These certificate programs also attract students who live in residence and participate on Students' Council and clubs.

Registrations have increased in most vocational programs since 2004, especially the Health Care Food Service Certificate, Horticultural Apprentice and Dairy Apprentice.

## **2.1.5 Business Development Programs**

The Business Development Units at each campus continue to offer a wide diversity of regional training needs on a full cost recovery basis. Some highlights for 2005/06 include:

- Training for water plant operators (First Nations Technical Services Corporation, INAC, Health Canada) through Campus d'Alfred.
- In 2005, the Ridgetown Campus entered into an Agreement with the MOE and the Walkerton Clean Water Centre to provide logistics and registration management services for the Drinking Water Operator Entry Level and Renewal Courses for operators of Ontario drinking water systems (700 student days).
- The Ridgetown Campus entered into an Agreement with OMAFRA to deliver the Nutrient Management Training and Certification Program, by providing logistics for training courses, hiring external trainers, administering exams, developing instructor training programs, and course development (1,232 student days).
- The Ontario Pesticide Education Program (OPEP), continues to operate successfully in its 18th year with the support of AGCare, MOE, OMAFRA, OABA, and CropLife.

- The Ag Business Centre at Ridgetown continues to partner with Economic Development Services of the Municipality of Chatham-Kent (CKEDS), and Sarnia Lambton Economic Partnership, providing administrative and registration support to agricultural conferences, co-ordinating agricultural awareness programs for students, providing office space and resources for commodity organizations, and working with Community Futures Development Corporation to present rural development seminars.
- The Livestock Medicines Education Program continues to operate from Ridgetown with support from Ontario livestock commodity organizations.
- Ontario Pesticide Training and Certification Program at Ridgetown continues to offer pesticide training & certification for applicants for the MOE exterminator license.
- The IPM Accreditation Program is being administered to landscape companies, park systems, and golf courses with the IPM-PHC Council through a process of certification, audit, and professional development.
- Veterinary Technician Correspondence Courses are continuing to be offered (four correspondence courses) that qualify for CEUs through the Ontario Association of Veterinary Technicians.
- A new program in Truck Driver Licensing at the Kemptville campus was initiated as a joint venture with the Greater Ottawa Truck Training Company.
- The one-month Turf Managers Course continues to be offered, with 49 students completing the course in February 2006. The course is an intensive residential program that is held in the G.M. Frost Research & Information Centre at the Guelph Turfgrass Institute. Participants came from Nova Scotia, Quebec, Ontario, Saskatchewan and British Columbia.

### **2.1.6 International Programs**

Campus d'Alfred was involved with international projects in the following locations during fiscal 2005/06: Comoros Islands, Equatorial Guinea, Democratic Republic of Congo, Morocco and Chad. We also had consultants present in Mauritania and Chile.

Kemptville Campus' Business Development Centre (KC BDC) staff and Dr. Don Mercer made a second successful mission to Tamil Nadu Agricultural University in India this year, aimed at training Indian business people in food processing. A group from China was initiated, resulting in 9 Chinese nationals coming to Kemptville training program with an agricultural group in August 2006. A proposal to AAFC, valued at \$17 million, for training in Vietnam, was initiated in 2005 by a group of partners including KC BDC. The proposal evaluation process stalled; consequently BDC has re-established links with its partners to apply again in 2006.

## **Summary**

The OMAFRA/UofG Agreement provides for a coordinated and effective broad educational mandate that is being met and strengthened annually. The hallmark of these programs is the 2 and 3-year residential diplomas valued by each campus, the industry and the communities they serve. These programs are complemented through a myriad of certificates, apprenticeships, training programs and international activity, all of which promote the uniqueness and value of the Agreement between the Ontario Ministry of Agriculture, Food and Rural Affairs and the University of Guelph.

## 2.2 Diploma Education Program Performance Measures

| Objective                                                                                                                          | Measure/Activity                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Result                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1, A, B, C<br>Deliver high quality education and training programs that meet the needs of the Ontario agri-food and rural sectors. | <p>A. Deliver programs using the most current knowledge and skills available through effective teaching programs</p> <p>B. Develop MTCU-style program measures and standards.</p> <p>C. Report annually on:<br/>- % student satisfaction<br/>- satisfaction of employers with graduates hired<br/>- percentage of graduates finding full-time employment</p> <p>Maintain enrolments, graduations, employment levels and satisfaction of students and employers. Reduce attrition rates.</p> | <p>A. The best measures of the quality of the educational programs are the very high placement rate of students from all programs each year, the increase in accreditation and articulation agreements with industry and other institutions respectively, the increase in the value of student awards funded by industry and the increase in instructor training and qualifications. Most programs have advisory boards or steering committees made up of industry leaders who review curriculum content and delivery annually. An improvement in teaching facilities has been initiated as a consequence of an infusion of minor-capital funds.</p> <p>B. Program standards and measures has been developed and approved at The Provincial Diploma Committee for the Agriculture and Horticulture diplomas. The other programs are in the approval process (Turfgrass management, Food nutrition and risk management, Environmental Management.) and will be brought forward during the 2006-2007 calendar year. In the Fall of 2006 the Food Nutrition and Risk Diploma programs at Kemptville and Alfred will be reviewed by the Canadian Society of Nutrition Management.</p> <p>C. Student satisfaction remains very high in all programs at all locations. For example at Ridgetown at the annual May survey of graduates, only 2 students out of the 179 that graduated reported that they were not satisfied with the education they received. Employer satisfaction mirrors these results. Job placement rates are very high ranging from 86% - 100% across the four institutions and five programs. Overall for the 338 graduates this represents greater than 93% employment level shortly after graduation.</p> <p>Enrolment levels increased slightly in 2005/06 and graduation rates were essentially maintained. Employment and satisfaction levels were maintained. Attrition rates in the two-year diplomas were decreased for the 2004 cohort and maintained for the 2005 cohort (Table 2.2-3). Attrition in the Vet Tech Alternative program for the 2004 cohort was within normal limits.</p> |
| 2<br>Strategy identifying new and regionally differentiated directions for education and training programs                         | By April 2004, complete Strategy, for presentation to Executive Committee                                                                                                                                                                                                                                                                                                                                                                                                                   | 2003/04 strategic changes have been implemented with introduction of differentiated programs in turf, environmental management, and food, nutrition and risk, and degree introductions scheduled for 2006 (Ridgetown) and 2007 (Kemptville).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 3<br>Increase College revenues through partnerships with industry or other educational institutions                                | Demonstrate positive growth in non-OMAFRA revenues over the 5-year term of the Agreement. Report annually on % change in non-OMAFRA funding.                                                                                                                                                                                                                                                                                                                                                | Non-OMAFRA revenues related to Diploma programs and Continuing Education/Business Development and Training programs increased by \$346K, to \$10.68 million in 2004/05. This represents an increase of 3.3% over 2004/05 levels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Objective                          | Measure/Activity                                                                                                                                                                  | Result                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4<br>Continuing Education Programs | Expand CE Programs on a cost recovery basis, meeting regional needs.<br>Track and report cost recovery status of CE Programs.<br>Maintain 2001/02 levels of CE revenues           | The revenues for CE/BDT programs increased substantially by over 5% compared to 2004/05 levels with revenues approaching \$5.3 million. Total net expenditures reported in 2005/06 were higher than 2004/05 levels.                                                                                                                                                           |
| 5 A, B<br>Financial Accountability | Report annually on:<br>- Annual average cost per diploma student<br>- Annual cost per student by Diploma Program<br><br>Maintain or decrease cost per student from 2001/02 level. | The average net cost per diploma student in 2005/06 on a fully allocated basis was \$4.8K per student across all programs and institutions a modest increase over 2004/05. Costs per diploma program are listed in Table 2.2.7 and reflect costs in previous years. Cost per student have increased roughly \$100 per student per year since 2001/02, a very modest increase. |

### ***Enrolments***

**Table 2.2.1: Summary of Diploma Program Enrolments (Full-time students)**

|           | Alfred | Kemptville | Ridgetown | Guelph | Total | Change |
|-----------|--------|------------|-----------|--------|-------|--------|
| 2005/2006 | 96     | 241        | 466       | 58     | 861   | 1.0%   |
| 2004/2005 | 113    | 217        | 464       | 63     | 857   | -12.8% |
| 2003/2004 | 128    | 254        | 398       | 203    | 983   | -7.5%  |
| 2002/2003 | 115    | 229        | 360       | 359    | 1,063 | 3.3%   |
| 2001/2002 | 109    | 223        | 341       | 356    | 1,029 | -2.3%  |

## *Graduation Statistics*

**Table 2.2.2: 2005/2006 Graduates**

| Diploma Program                                    | Alfred                  |                         | Kemptonville             |                         | Ridgetown                |                          | Guelph                   |                          | Total      |            |
|----------------------------------------------------|-------------------------|-------------------------|--------------------------|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|------------|------------|
|                                                    | 04/05                   | 05/06                   | 04/05                    | 05/06                   | 04/05                    | 05/06                    | 04/05                    | 05/06                    | 04/05      | 05/06      |
| <b>Agric.</b><br>- Graduates<br>- % Employed       | 23<br>88%               | 14<br>92%               | 71<br>96%                | 66 <sup>a</sup><br>95%  | 83<br>99%                | 95<br>100%               | --                       | --                       | 177        | 175        |
| <b>Horticulture</b><br>- Graduates<br>- % Employed | 1<br>100%               | --                      | 5<br>100%                | 1<br>100%               | 21<br>90%                | 27<br>95%                | 26 <sup>c</sup><br>100%  | 21<br>100%               | 53         | 49         |
| <b>Envir. Mgt.</b><br>- Graduates<br>- % Employed  | --                      | --                      | --                       | --                      | 24<br>83%                | 25<br>92%                | --                       | --                       | 24         | 25         |
| <b>Food</b><br>- Graduates<br>- % Employed         | 3<br>100%               | 10<br>100%              | 25<br>70%                | 23 <sup>b</sup><br>60%  | --                       | --                       | --                       | --                       | 28         | 33         |
| <b>Equine</b><br>- Graduates<br>- % Employed       | --                      | --                      | --                       | --                      | --                       | --                       | --                       | --                       | --         | --         |
| <b>Vet Tech</b><br>- Graduates<br>- % Employed     | 21<br>95%               | 23<br>91%               | --                       | --                      | 37<br>74%                | 33<br>84%                | --                       | --                       | 58         | 56         |
| <b>Total</b><br>- Graduates<br>- % Employed        | <b>48</b><br><b>92%</b> | <b>47</b><br><b>93%</b> | <b>101</b><br><b>90%</b> | <b>90</b><br><b>86%</b> | <b>165</b><br><b>83%</b> | <b>180</b><br><b>96%</b> | <b>26</b><br><b>100%</b> | <b>21</b><br><b>100%</b> | <b>340</b> | <b>338</b> |

<sup>(1)</sup> Students that have not been able to be reached after 3 tries have not been included in the calculation of % Employed

Similarly; students pursuing further studies have not been included in the calculation of % Employed

\* First graduating class from the Turfgrass Diploma Program at Guelph

**Table 2.2-3: Attrition Rates for 2004 and 2005 Diploma Cohorts (2-year programs)**

**Table 2.2.3a: 2004 Cohort**

|                        | <b>Alfred</b> | <b>Kemptville</b> | <b>Ridgetown</b> | <b>Guelph</b> | <b>Total</b> |
|------------------------|---------------|-------------------|------------------|---------------|--------------|
| # Enrolled in Fall '04 | 58            | 111               | 198              | 34            | 401          |
| # Enrolled in Fall '05 | 51            | 94                | 190              | 29            | 364          |
| # Graduated            | 45            | 88                | 179              | 21            | 334          |
| Attrition in Year 1    | 12%           | 15%               | 4%               | 15%           | 9%           |
| Attrition in Year 2    | 12%           | 6%                | 6%               | 28%           | 8%           |
| <b>Total Attrition</b> | <b>22%</b>    | <b>21%</b>        | <b>10%</b>       | <b>38%</b>    | <b>17%</b>   |

**Table 2.2.3b: 2005 Cohort**

|                          | <b>Alfred</b> | <b>Kemptville</b> | <b>Ridgetown</b> | <b>Guelph</b> | <b>Total</b> |
|--------------------------|---------------|-------------------|------------------|---------------|--------------|
| # Enrolled in Fall 2005  | 45            | 147               | 198              | 33            | 423          |
| # Enrolled in Fall 2006* | 38            | 126               | 186              | 31            | 381          |
| Attrition Year 1         | 16%           | 14%               | 6%               | 6%            | 10%          |

Note: Number of graduates listed in Table 2.2.2 may be slightly higher than listed in Table 22.3 as each year a few students from previous classes complete their requirements for graduation.

\* Expected Senior enrolment as of July 28/06.

**Table 2.2.4: Summary of Attrition Statistics – 2 year Diploma Program**

|                                   | <b>Alfred</b> | <b>Kemptville</b> | <b>Ridgetown</b> | <b>Guelph</b> | <b>Total</b> |
|-----------------------------------|---------------|-------------------|------------------|---------------|--------------|
| <b><u>Attrition in Year 1</u></b> |               |                   |                  |               |              |
| 2005 cohort                       | 16%           | 14%               | 6%               | 6%            | 10%          |
| 2004 cohort                       | 14%           | 14%               | 3%               | 3%            | 8%           |
| 2003 cohort                       | 17%           | 20%               | 14%              | 6.5%          | 16%          |
| 2002 cohort                       | 21%           | 18%               | 7%               | 19%           | 16%          |
| 2001 cohort                       | 19%           | 25%               | 5%               | 7%            | 12%          |
| <b><u>Attrition in Year 2</u></b> |               |                   |                  |               |              |
| 2005 cohort                       | n/a           | n/a               | n/a              | n/a           | n/a          |
| 2004 cohort                       | 12%           | 6%                | 6%               | 28%           | 8%           |
| 2003 cohort                       | 17%           | 7%                | 7%               | 10%           | 8%           |
| 2002 cohort                       | 21%           | 15%               | 9%               | 0.6%          | 9%           |
| 2001 cohort                       | 12%           | 23%               | 14%              | 17%           | 17%          |
| <b><u>Total Attrition</u></b>     |               |                   |                  |               |              |
| 2005 cohort                       | <b>n/a</b>    | <b>n/a</b>        | <b>n/a</b>       | <b>n/a</b>    | <b>n/a</b>   |
| 2004 cohort                       | <b>22%</b>    | <b>21%</b>        | <b>10%</b>       | <b>38%</b>    | <b>17%</b>   |
| 2003 cohort                       | <b>34%</b>    | <b>28%</b>        | <b>19%</b>       | <b>16%</b>    | <b>24%</b>   |
| 2002 cohort                       | <b>29%</b>    | <b>30%</b>        | <b>15%</b>       | <b>20%</b>    | <b>24%</b>   |
| 2001 cohort                       | <b>29%</b>    | <b>42%</b>        | <b>19%</b>       | <b>24%</b>    | <b>27%</b>   |

**Table 2.2.5: Attrition Rates for 3-year Vet. Tech. Program at Ridgetown**

The summer Vet. Tech. program is a three-year course, so the numbers cannot be included with the two-year program numbers. This table summarizes the enrolments and attrition rates for this program.

Summer Vet Tech Cohorts Summer Vet Tech Cohorts

|                                        | Cohort Year |                   |                  |                   |      |
|----------------------------------------|-------------|-------------------|------------------|-------------------|------|
|                                        | 2001        | 2002              | 2003             | 2004              | 2005 |
| # Enrolled in Fall 2001                | 40          |                   |                  |                   |      |
| # Enrolled in Fall 2002                | 30          | 43 <sup>(2)</sup> |                  |                   |      |
| # Enrolled in Fall 2003 <sup>(1)</sup> | 27          | 35                | 0 <sup>(1)</sup> |                   |      |
| # Enrolled in Fall 2004                |             | 35                |                  | 45                |      |
| # Enrolled in Fall 2005                |             |                   |                  | 34 <sup>(2)</sup> | 44   |
|                                        |             |                   |                  |                   |      |
| Graduated                              | 27          | 32                | 0 <sup>(1)</sup> |                   |      |
|                                        |             |                   |                  |                   |      |
| Attrition in Year 1                    | 25%         | 19%               |                  | 13%               |      |
| Attrition in Year 2                    | 10%         | 3%                |                  |                   |      |
| Attrition in Year 3                    | 0%          | 0%                |                  |                   |      |
| Total Attrition                        | 33%         | 11%               |                  |                   |      |

<sup>(1)</sup> No intake of Vet. Tech. students in Fall 2000 and 2003 due to space limitations.

<sup>(2)</sup> This number is adjusted from the 2001/2002 and 2004/05 Annual Report respectively to reflect actual enrolment rather than pre-registration numbers.

**Table 2.2.6: 2005/2006 Teaching Cost <sup>(1)</sup> per Student by Program (in thousand's of dollars)**

|                                             | <u>DIPLOMA PROGRAMS</u> |              |             |             |             |                     | <u>TOTAL</u> |
|---------------------------------------------|-------------------------|--------------|-------------|-------------|-------------|---------------------|--------------|
|                                             | <u>AGRI</u>             | <u>ENV'T</u> | <u>FOOD</u> | <u>HORT</u> | <u>TURF</u> | <u>VET<br/>TECH</u> |              |
| <u>SUMMARY</u>                              |                         |              |             |             |             |                     |              |
| NUMBER OF STUDENTS SEPTEMBER 2005           | 398                     | 59           | 60          | 72          | 62          | 205                 | 846          |
| TOTAL EXPENDITURES <sup>(1 AND 2)</sup>     | 2,603                   | 352          | 817         | 692         | 298         | 1,543               | 6,304        |
| TOTAL EXPENDITURES / STUDENTS               | 6.5                     | 6.0          | 16.3        | 9.6         | 4.8         | 7.5                 | 7.5          |
| REVENUES                                    | 1,182                   | 188          | 162         | 215         | 261         | 722                 | 2,729        |
| TOTAL NET EXPENDITURES <sup>(1 AND 2)</sup> | 1,421                   | 164          | 655         | 477         | 37          | 821                 | 3,575        |
| TOTAL NET EXPENDITURES / STUDENT            | 3.6                     | 2.8          | 13.1        | 6.6         | 0.6         | 4.0                 | 4.2          |
| LOCATIONS WHERE PROGRAM IS OFFERED:         |                         |              |             |             |             |                     |              |
| ALFRED                                      | ✓                       | ✓            | ✓           |             |             |                     | ✓            |
| KEMPTVILLE                                  | ✓                       |              | ✓           | ✓           |             |                     |              |
| GUELPH                                      | ✓                       |              |             | ✓           | ✓           |                     |              |
| RIDGETOWN                                   | ✓                       | ✓            |             | ✓           |             |                     | ✓            |

<sup>(1)</sup> 'Teaching Costs' include direct costs plus allocated academic services plus location infrastructure and support but exclude both location ancillary costs (cafeteria, residence) and allocated institutional service costs.

<sup>(2)</sup> Utility and maintenance costs, normally included in infrastructure costs only at College d'Alfred, have been removed from Alfred's costs to allow direct comparison of Cost per Student to other Colleges.

**TABLE 2.2.7: 2005/2006 VALUE OF DIPLOMA STUDENT ASSISTANCE**

|                                        | ALFRED |        | KEMPTVILLE |        | RIDGETOWN |         | GUELPH |        | TOTAL   |         |
|----------------------------------------|--------|--------|------------|--------|-----------|---------|--------|--------|---------|---------|
|                                        | 04/05  | 05/06  | 04/05      | 05/06  | 04/05     | 05/06   | 04/05  | 05/06  | 04/05   | 05/06   |
| STUDENT AWARDS (\$)                    | 31,680 | 28,775 | 60,268     | 71,075 | 55,175    | 123,700 | 2,000  | 10,850 | 149,123 | 234,400 |
| VALUE OF AWARDS<br>(\$ ) PER STUDENT * | 356    | 300    | 278        | 328    | 121       | 265     | 59     | 187    | 174     | 272     |

\* Total value of awards divided by the total number of diploma students in all programs.

## 2.3 Business Development Training

- Activities for Business Development Training are funded through contracts and certificate courses (including residential programs of up to one academic year), with the objective of attaining cost self-sufficiency.

**Table 2.3.1 : Student Days and Range of Fees/Student Day for C.E. Courses.**

|                                           | Alfred   |          | Kemptonville |          | Ridgetown |          | Total  |        |
|-------------------------------------------|----------|----------|--------------|----------|-----------|----------|--------|--------|
|                                           | 04/05    | 05/06    | 04/05        | 05/06    | 04/05     | 05/06    | 04/05  | 05/06  |
| # of Student Days (6 hrs/day)             | 4,484    | 8,484    | 21,736       | 27,354   | 18,548    | 19,754   | 44,768 | 55,592 |
| Diploma Student Equivalent <sup>(1)</sup> | 37       | 70       | 181          | 228      | 155       | 165      | 373    | 463    |
| Fees/day (\$) <sup>(2)</sup>              | 30 - 800 | 30 - 160 | 75 - 190     | 85 - 200 | 500-200   | 85 - 200 |        |        |

<sup>(1)</sup> Calculation: Divide number of student days by 120 (the number of days in a student year)

<sup>(2)</sup> This shows the range in course fee charges, per day, to provide some contextual comparison from year-to-year and location-to-location.

## **2.4 Veterinary Clinical Education Program**

### **2.4.1 An Overview**

The Veterinary Clinical Education Program (VCEP) Agreement provides annual base funding to the Ontario Veterinary College (OVC) to meet the continuing needs for:

- “veterinary graduates who have a high level of appropriate clinical experience in veterinary medicine to service Ontario animal owners”;
- “an animal referral hospital which will service satisfactorily Ontario’s veterinary practitioners and animal owners”.

### **2.4.2 Objectives of the Program**

- A. Meet the accreditation requirements of the Canadian and American Veterinary Medical Associations as well as the College of Veterinarians of Ontario,
- B. Provide the clinical education component for veterinary students in the Doctor of Veterinary Medicine undergraduate program,
- C. Operate the Veterinary Teaching Hospital clinics including large animal, small animal, field service and diagnostic laboratories,
- D. Offer a one-year post-graduate Veterinary Internship Program in the large animal and small animal clinics,
- E. Offer an advanced clinical training program entitled Doctor of Veterinary Science (D.V.Sc.) in various medicine and health maintenance disciplines,
- F. Offer an externship program of approved clinical experience with a private veterinary practitioner or a relevant public/private sector organization,
- G. Offer referral and emergency veterinary services to Ontario veterinary practitioners and the animal-owning public. These include medicine and health maintenance services.

### **2.4.3 Resource Allocation**

To meet the objectives of the VCEP agreement, VCEP funds were allocated to three programs: the Clinical Education Program (Objectives A to D and G), the D.V.Sc. Program (Objective E) and the Externship Program (Objective F). Table 2.4-1 summarizes the program’s objectives, budget and expenditures. The total available VCEP budget in 2005/2006 was \$4,671,471. For the year ending April 30, 2006 expenditures totalled \$4,691,662 leaving a balance of (\$20,191). Of this budget, \$3,937,750 went towards the Clinical Education Program (CEP), \$506,680 to the D.V.Sc. program and \$247,232 to the Externship Program.

The CEP portion of VCEP funded 11.5 faculty FTEs in the Departments of Clinical Studies and Population Medicine. These faculty positions support teaching and service in large animal medicine and

surgery, anaesthesia, dairy, beef, sheep and swine health management and theriogenology. It also supported 2 professional staff, 19 staff, 6 internship students and 7 staff veterinarians in the Veterinary Teaching Hospital.

The D.V.Sc. portion provided funding for 29 of the College's 50 D.V.Sc. students. The Externship portion of VCEP provided support for the student relocation allowance, organizational support staff, operating expenses and insurance, needed to deliver the course. The latter 8 week fourth year course is generally taken during the spring semester and is compulsory for all DVM students.

Table 2.4.1: VCEP Budget and Expenditures for Core Strategic Programs by Objective: 2005/2006

| <b>Programs</b>    | <b>Objectives <sup>(1)</sup></b>                                                                        | <b>Expenditures Compared to Budget 2005/2006</b> |                         |
|--------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------|
| Clinical Education | A Meet accreditation requirements                                                                       | Personnel                                        | 3,514,830               |
|                    | B Provide clinical education component for veterinary students in the DVM Program                       | Operating Costs                                  | <u>422,920</u>          |
|                    | C Operate the veterinary teaching hospital                                                              | Total                                            | 3,937,750               |
|                    | D Offer a one-year internship program                                                                   | <b>Budget</b>                                    | <b><u>3,914,279</u></b> |
|                    | G Offer referral and emergency veterinary services to practitioners and animal owning public in Ontario | Balance                                          | <u>(23,471)</u>         |
| DVSc               | E Offer an advanced clinical training program entitled Doctor of Veterinary Science                     | Support for DVSc's                               | 506,680                 |
|                    |                                                                                                         | <b>Budget</b>                                    | <b><u>506,680</u></b>   |
|                    |                                                                                                         | Balance                                          | <u>-</u>                |
| Externship         | F Offer an externship program of approved clinical experience                                           | Support for External Program                     | 247,232                 |
|                    |                                                                                                         | <b>Budget</b>                                    | <b><u>250,512</u></b>   |
|                    |                                                                                                         | Balance                                          | <b><u>3,280</u></b>     |
| <b>Grand Total</b> |                                                                                                         | Total Expenditures                               | 4,691,662               |
|                    |                                                                                                         | <b>Budget<sup>(2)</sup></b>                      | <b><u>4,671,471</u></b> |
|                    |                                                                                                         | Balance                                          | <u>(20,191)</u>         |

<sup>(1)</sup> See section 2.4.2 for complete objective descriptions

<sup>(2)</sup> Total includes a carry-forward of \$21,823 from 2004/05

## Performance Management Agreement

### 2.4.4 CLINICAL EDUCATION PROGRAM

In compliance with Objectives A, B, C, D, and G of the VCEP Agreement, the OVC delivers a Clinical Education Program. To support this program, VCEP funding is allocated in the VTH and the three academic departments involved in clinical education: Pathobiology, Clinical Studies and Population Medicine.

Clinical Education is the largest component of the VCEP agreement. This program supports the clinical training of DVM students within the VTH. Clinical experience is gained in the various VTH services that include clinics in the large animal and small animal areas, and a field service program. Additionally, the Hospital offers referral and emergency services to veterinary practitioners and the animal-owning public for 24 hours a day, 365 days of the year. One hundred and six students were enrolled in the final year program in 2005/06

**Objective A: Meet the accreditation requirements of the Canadian and American Veterinary Medical Associations (CVMA, AVMA) as well as the College of Veterinarians of Ontario (CVO).**

#### Performance Measures and Targets

**Objective:** To meet the accreditation requirements of the Canadian and American Veterinary Medical Associations as well as the College of Veterinarians of Ontario;

**Expectation:** The OVC will maintain its accredited status with the CVMA/AVMA, CVO and AAHA indefinitely.

#### Measurement Instrument:

- DVM Program assessment by the Council of Education of the American Veterinary Medical Association (AVMA).
- Annual Report sent to Council on Education of the AVMA.
- Accreditation of relevant clinics of the Veterinary Teaching Hospital (VTH) by the College of Veterinarians of Ontario.
- Accreditation status of relevant sections of the VTH, small animal clinical facilities, personnel and equipment by the American Animal Hospital Association (AAHA).

#### 2005/2006 Outcome:

The OVC was granted full accreditation after the AVMA Council of Education site visit in February 2002 for a period not to exceed seven (7) years.

The AVMA accreditation process was developed to ensure quality professional veterinary education. The process uses periodic accreditation reviews to determine the degree to which the College meets a described set of standards as well as its own stated mission and objectives. The AVMA standards are recognized globally. This accreditation is crucial for the OVC to maintain its international reputation, to recruit candidates, to serve its mandate of teaching, research and service and to subsequently train veterinarians to meet the needs of the Province of Ontario.

The College of Veterinarians of Ontario (CVO) administers the Ontario Veterinarians Act. One requirement for licensure in Ontario is graduation from an AVMA/CVMA accredited college. In addition, no person can provide service from a veterinary facility unless the facility is CVO accredited.

The VTH could not legally operate its various clinics without CVO accreditation. A site visit and inspection was conducted by the CVO in February 2002, with the next inspections scheduled for 2009. The VTH met all accreditation requirements for the small animal, food animal and mobile units.

**Objective B: Provide the clinical education component for veterinary students in the Doctor of Veterinary Medicine undergraduate Program.**

Outcome assessment is now an integral part of the AVMA accreditation standards. In addition to the performance measures of the VCEP agreement the OVC has established additional performance measures to monitor student performance with a view to ongoing enhancement of its programs.

**Performance Measures and Targets**

**Objective:** To determine the degree of employer's satisfaction with new DVM graduate's performance in the workplace within the first year after graduation

**Expectation:** That greater than 80% of employers surveyed will express satisfaction with New Graduate Performance in the Workplace during the first year following graduation from the OVC.

**Measurement Instrument:** Employer Questionnaire

Employers of graduates of OVC 2004 were mailed questionnaires in August 2004. These veterinarians were asked to evaluate their new employee's overall performance / competence to do the job for which he/she was hired as: Superior, Very Good, Good, Poor (marginal but acceptable) or Very Poor (unacceptable or unsatisfactory performance).

**2005/2006 Outcome:**

The response rate to the survey was 64%. Of the employers who responded 96% were satisfied (i.e. rated new graduates as Superior, Very Good, or Good) with their employee's overall performance/competence, three to five months after graduation, to do the job for which they were hired.

**Objective:** To determine OVC graduates' perception/assessment of their preparedness for the job opportunities and responsibilities encountered in the workplace

**Expectation:** That greater than 80% of the graduates surveyed would express satisfaction with their performance in the workplace during the first year following graduation from OVC.

**Measurement Instrument:** New Graduate Survey

Graduates of OVC 2005 were mailed questionnaires in August 2006. They were asked to evaluate their own overall performance / competence to do the job for which they were hired as: Superior, Very Good, Good, Poor (marginal but acceptable) or Very Poor (unacceptable or unsatisfactory performance).

**2005/2006 Outcome:**

The response rate to the survey was 75%. Of new graduates who responded, 95% were satisfied (i.e. rated their performance as Superior, Very Good, or Good) with their overall performance / competence, three to five months after graduation, to do the job for which they were hired

**Objective C: Operate the Veterinary Teaching Hospital clinics including large animal, small animal, field service and diagnostic laboratories.**

### **Performance Measures and Targets**

**Objective:** To provide a reasonable volume of cases and teaching animals for student learning.

**Expectation:** A reasonably stable caseload of both client cases and teaching animals is maintained to allow instructors to teach with real clinical cases.

**Measurement Instrument:**

VTH statistics

**2005/2006 Outcome:**

| <b>Caseload in the Veterinary Teaching Hospital</b> | <b>2005/6</b> | <b>2004/5</b> |
|-----------------------------------------------------|---------------|---------------|
| Small Animal Client Admissions                      | 12,412        | 12,447        |
| Large Animal Client Admissions                      | 1,624         | 1,708         |
| Ruminant Field Service, Farm Visits                 | 1,538         | 1,684         |

As shown above, the provision of on farm large animal services continues to be an area of emphasis.

**Objective D: Offer a one-year post-graduate Veterinary Internship Program in the Large and Small Animal Clinics.**

A one-year internship involves specialization in either the VTH's Small or Large Animal Clinics. Interns are usually new or recent graduates wishing to increase their level of discipline skills in an academic environment or to use this experience to help gain entry to more advanced graduate programs (i.e. D.V.Sc., Residency). Experienced veterinarians may choose an Internship to help them upgrade their level of knowledge or reorient their career path after some time spent in practice. The interns are paid a stipend of \$22,000 per year. Currently VCEP funds support six interns. Revenue from the VTH funds an additional nine interns.

### **Performance Measures and Targets**

**Objective:** To provide the graduate intern with a more competitive ability for acquiring a job, either in practice or in a residency program.

**Expectation:** At least 30% of the Interns that applied for residencies are successful in their application, and 70% of the Interns that applied to specialty practices are successful in their application.

**Measurement Instrument: Exit Survey**

At the end of the program VTH Interns are surveyed as to their employment location and type of job for the upcoming year. Success rate in terms of obtaining a Residency will also be obtained.

**2005/2006 Outcome:**

**As of June 2005,**

10 of 16 Interns were successful in obtaining residency programs,

2 obtained Fellowships,

1 obtained a Ph.D. position

1 obtained a Post Graduate Research position

1 went into academic practice  
1 obtained employment in private practice.

**Objective G: Offer referral and emergency veterinary services to Ontario veterinary practitioners and the animal-owning public. These include medicine and health maintenance services.**

**Performance Measures and Targets**

**Objective:** To meet the mandate as a full-service veterinary referral/emergency resource for the Province of Ontario. This service includes both emergency referral and elective referral services. The emergency service is available for 365 days / year, 24 hours / day for all common domestic species.

**Expectation:** All emergency referrals and 95% of all elective referrals will be accommodated by the Veterinary Teaching Hospital. Specialty services will be available for referral by Ontario veterinarians.

**Measurement Instrument:**

VTH statistics

**2005/2006 Outcome:**

| 2005/2006 Client Referral Caseload |                           |                           |
|------------------------------------|---------------------------|---------------------------|
|                                    | Small Animal Client Cases | Large Animal Client Cases |
| Elective                           | 10,220                    | 977                       |
| Emergency                          | 2,192                     | 647                       |
| <b>Total</b>                       | <b>12,412</b>             | <b>1,624</b>              |

### 2.4.5 Externship Program

In compliance with Objective F of the VCEP Agreement, the OVC delivers an Externship Program.

**Objective F:** Offer an Externship Program of approved clinical experience with a private veterinary practitioner or a relevant public/private sector organization.

#### Performance Measures and Targets

**Objective:** To assess progress in achieving stated learning objectives during the Externship Course.

**Expectation:** That a statistically significant improvement in mean clinical performance scores will be achieved in most categories tested over the course of the Externship Course.

#### Measurement Instrument: Interim and final evaluation questionnaires.

Joint interim and final evaluation questionnaires were used for this assessment. These questionnaires, which were completed by the externship student together with his/her Externship Course host, assessed 82 activities in large animal private primary care practice and 100 clinical activities in a small animal private primary care practice. Assessed activities included the ability to collect a relevant and accurate history, physical examination of an animal, formulation of a differential diagnostic problem list, development of a treatment plan and development of preventive strategies for common diseases and other problems encountered in domestic animals.

For the summer of 2005 (OVC 06 the improvement in students' clinical performance over the eight-week placement involved in the Externship Course was similar to that reported over the previous five years. Again, data collected for the class of OVC '06 reflected considerable consistency in the clinical capabilities of OVC students at the end of their third year of the professional program. Some areas that did not show improvement did not do so because case numbers were too few. Summaries of the data on which these comments are based are available on request.

**Summaries of the data on which these comments are based are available on request.**

#### 2004/2005 Outcome:

Statistically significant improvement in clinical performance scores was achieved in 161/182 of the categories or activities assessed.

**Objective:** To assess the extern's knowledge base and skills at the end of the Externship Placement.

**Expectation:** That 100% of the students will perform at a satisfactory ("C" grade) level or higher.

#### Measurement Instrument: Host Practitioner Evaluations.

Host practitioners evaluated their extern's clinical capabilities in terms of diagnostic process skills, delivery of veterinary care, technical skills and professional conduct at the end of the Externship Placement. Each student in the class (n=100) achieved a score of 80% or higher.

**Copies of the assessment forms and the analyses are available upon request.**

#### 2004/2005 Outcome:

One hundred percent of the class of OVC '05 (Summer '04 Externship) performed at better than a "C" grade level.

#### **2.4.6 D.V.Sc. PROGRAM**

In compliance with Objective E of the VCEP Agreement, the OVC delivers the D.V.Sc. Program.

**Objective E: Offer an advanced clinical training program entitled Doctor of Veterinary Science in various medicine and health maintenance disciplines.**

#### **Performance Measures and Targets**

**Expectation:** At least 90% of the students will complete the program successfully in approximately three years.

**Measurement Instrument:** University of Guelph graduate student registration data

#### **2005/2006 Outcome:**

During 2005/2006, 23 D.V.Sc. students funded from all sources completed the program. Details of department and discipline, regarding new students, in-course students and graduates are outlined in Table 2.4.6-1.

The normal duration of the D.V.Sc. program, and funding support, is nine semesters (three years). The College maintains the equivalent of one stipend in “reserve” to deal with one-semester extensions when needed to complete the thesis. Occasional students receive an additional semester of support if a formal request is made by the faculty Advisor and Advisory Committee.

Table 2.4.6.1: D.V.Sc. Total New Students, Enrolment and Graduations During 2005/06

| Department          | Discipline                       | New Students + | Enrolment *     | Graduations     |
|---------------------|----------------------------------|----------------|-----------------|-----------------|
| Pathobiology        | Anatomic Pathology               | 0              | 4(4**)          | 1(1**)          |
|                     | Clinical Pathology               | 1(1**)         | 4(3**)          | 2(1**)          |
|                     | Zoo Medicine                     | 0              | 4(2**)          | 2(1**)          |
|                     | Laboratory Animal Science        | 0              | 4(0**)          | 1(0**)          |
|                     | Comparative Pathology and Other  | 0              | 1(0**)          | 1(0**)          |
|                     | <b>Total Pathobiology</b>        | <b>1(1**)</b>  | <b>17(9**)</b>  | <b>7(3**)</b>   |
| Clinical Studies    | Anesthesiology                   | 0              | 3(1**)          | 2(1**)          |
|                     | Companion Animal                 | 3(1**)         | 9(3**)          | 5(2**)          |
|                     | Large Animal                     | 1(1**)         | 7(7**)          | 3(3**)          |
|                     | ICU                              | 0              | 1(1**)          | 0               |
|                     | Cardiology and Radiology         | 2(1**)         | 5(1**)          | 3(1**)          |
|                     | <b>Total Clinical Studies</b>    | <b>6(3**)</b>  | <b>25(14**)</b> | <b>13(7**)</b>  |
| Population Medicine | Theriogenology                   | 1(1**)         | 3(2**)          | 1(0**)          |
|                     | Health Management                | 2(2**)         | 5(4**)          | 2(2**)          |
|                     | <b>Total Population Medicine</b> | <b>3(3**)</b>  | <b>8(6**)</b>   | <b>3(2**)</b>   |
| Biomedical Sciences | <b>Total Biomedical Sciences</b> | <b>0</b>       | <b>0</b>        | <b>0</b>        |
| <b>OVC Total</b>    |                                  | <b>10(7**)</b> | <b>50(29**)</b> | <b>23(12**)</b> |

Table includes all new D.V.Sc. students for the period May 1, 2005 to April 30, 2006.

\* Based on Winter 2006 enrolment. Actual enrolment varies slightly over the three semesters.

+ Based on Fall 2005 enrolment. Most new students start in the Fall semester.

\*\* VCEP supported students.

**Expectation:** Enrolment in the D.V.Sc. Program should be at least 20 students

**Measurement Instrument:** University of Guelph graduate student registration data

#### 2005/2006 Outcome:

The College's D.V.Sc. program had 29 VCEP funded positions, (based on 2/3 VCEP, 1/3 MTCU agreed split) with the remainder funded from other sources. Table 2.5.6-2 includes D.V.Sc. graduates for period May 1, 2005 to April 30, 2006.

Table 2.4.6.2 D.V.Sc. Graduate student placements 2005-2006

| Department                 | Discipline                    | Graduate Placement                                            |
|----------------------------|-------------------------------|---------------------------------------------------------------|
| <b>Pathobiology</b>        | Anatomic Pathology            | Yet to find work*                                             |
|                            |                               | Yet to find work                                              |
|                            | Clinical Pathology            | Diagnostic Pathologist, Central Laboratory for Veterinarians* |
|                            |                               | Physician, Northern Ontario                                   |
|                            | Zoo Medicine                  | Faculty, Koret School of Veterinary Medicine, Jerusalem*      |
|                            | Laboratory Animal             | Yet to find work                                              |
|                            | Comparative Pathology & Other | Research Associate, Sick Kids, Toronto                        |
| <b>Clinical Studies</b>    | Anesthesiology                | Yet to find work*                                             |
|                            |                               | Staff Anesthesiologist, OVC                                   |
|                            | Companion Animal              | Veterinary Emergency and Specialty Clinic, Mississauga        |
|                            |                               | Yet to find work (X2)                                         |
|                            |                               | ACVS Certified Surgeon in Private Practice, Toronto*          |
|                            |                               | Private Practice, Mississauga*                                |
|                            | Large Animal                  | PhD Program, Ohio*                                            |
|                            |                               | Unknown*                                                      |
|                            |                               | Private Practice, Wisconsin*                                  |
|                            | Cardiology & Radiology        | Veterinary Emergency and Referral Clinic, Toronto*            |
|                            |                               | Unknown                                                       |
|                            |                               | Referral Practice, California                                 |
| <b>Population Medicine</b> |                               | Post-Doctoral Fellow, OVC*                                    |
|                            | Health Management             | Employee of Population Medicine, OVC*                         |
|                            | Theriogenology                | Alberta Agri. Food and Rural Development, Edmonton            |

Table includes all graduate placements for the period May 1, 2004 to April 30, 2005.

\* VCEP supported students.

## **3. Laboratory Services Division**

### **3.1 Introduction**

The Laboratory Services Division (LS) provides testing and diagnostic services to public and private clients in the agriculture, food and veterinary industries. Each year, more than half of the testing/services LS provides is the result of the OMAFRA/University of Guelph Agreement. Under this Agreement, LS provides testing/services for the following OMAFRA divisions:

- Agri-food testing for the Food Safety and Environment Division (FSED)
- Diagnostic services for the Innovation and Competitiveness Division (ICD)

The Animal Health Lab (AHL) of LS provides a disease surveillance program for ICD. This program is based on a passive submission system where the actual number of tests is not defined but a target volume of cases has been established.

The above testing/services provided by LS support a number of provincial regulatory acts including the Milk Act, the Meat Inspection Act, the Farm Products Grades and Sales Act, and the Food Safety and Quality Act (2001).

### **3.2 Highlights**

#### **Division**

- Our annual client survey found that 97% of the clients of the LS agri-food labs (95 Stone Rd) were satisfied with the service provided (27% were delighted) and 100% of the clients of the LS AHL labs were satisfied with the service provided (24% were delighted).
- During 2005/06, LS continued to expand the number of individual test methods that are accredited to an ISO 17025 standard to meet changing client needs. This was a major effort and 36 new tests were accredited (46 methods were accredited in 2004/05).
- Significant In-Year-Change requests have come from OMAFRA in response to the dynamic nature of their risk management programs. As a result, Lab Services responded by instituting a communication liaison manager to help manage the needs of activities associated with Schedule K. This has resulted in improved communications and enhanced cooperation between the parties involved. Continuous improvement remains a key focus for Laboratory Services in dealing with OMAFRA.
- Dr. Patricia Collins retired from Lab Services in 2005, after 6 years as the General Manager of LS. Dr. Michael Clayman began as the new Managing Director on September 1, 2005.
- LabVantage was selected as the vendor of the new AHL laboratory information management system (Sapphire LIMS), and planning for the design has involved OMAFRA, OVC, and external clients. Service improvements will occur through Web-based submissions and reporting, and through increased efficiencies in laboratory processes. The Sapphire LIMS system that was selected is a Web-based version of the same system that was implemented in the 95 Stone Road facility (95S) in 2001/02. The 95S Sapphire LIMS will be updated / upgraded after the completion of the AHL implementation.
- The Animal Health Lab performed approximately 677,000 procedures (one or more test per procedure) in support of disease surveillance while the laboratories at 95 Stone Road performed 1,007,000 tests in support of regulatory programs. Each test generated a reportable result.

## **Animal Health**

- OMAFRA awarded the U of G \$25M in support of renewal of the Animal Health Laboratory. This infrastructure support matches the previously announced \$37.3M from the federal government for upgrades to the diagnostic and research capabilities of the AHL and the OVC Department of Pathobiology.
- OMAFRA awarded the AHL \$250,000 for the purchase of high-capacity real-time PCR equipment to be used particularly in the event of an outbreak of highly pathogenic avian influenza in Ontario. The AHL continues to test wild birds and domestic poultry for avian influenza virus, and is a participant in the CFIA-sponsored Avian Influenza Laboratory Network and the Ontario Avian Influenza Working Group.
- The role of the AHL in protecting public health was strengthened by the development of the Office of the Chief Veterinarian of Ontario (OCVO) in OMAFRA, and the strong links of this office with the Chief Medical Officer of Health. The AHL also participates in the OVC Public Health Initiative Committee that has submitted a \$10M CFI application to support a new Center for Public Health and Zoonoses.
- The AHL is a partner in the new CFIA-led Canadian Animal Health Surveillance Network (CAHSN), which will provide local testing for agents of foreign animal diseases (FADs; e.g., foot and mouth disease, classical swine fever), computer links to a national database, and links to public health through the Canadian Public Health Infostructure (CNPHI).
- As a member of the CFIA-sponsored TSE Laboratory Network, the AHL continued to test brains from downer cattle to rule out BSE, and brains of elk and deer to rule out chronic wasting disease (CWD). The AHL also conducted susceptibility genotyping testing for scrapie (another TSE) for CFIA and in support of a national scrapie control program.
- Workload increased markedly in the mammalian virology lab in response to outbreaks of porcine reproductive and respiratory syndrome (PRRS) and porcine circovirus-2 associated diseases (PCVAD) in Ontario. The AHL works closely with swine veterinarians and industry, e.g., through the OPIC Swine Health Advisory Board (OSHAB), to deal with these devastating agents.
- The AHL informed OMAFRA of 99 reportable or notifiable disease events that were suspected and/or confirmed in Ontario in 05/06, ranging from anthrax through influenza, and participated in the investigation of various disease outbreaks.

## **Agriculture and Food**

- LS seized a unique opportunity to install and further develop advanced technology for the detection of plant-pathogenic and certain beneficial microorganisms in plants, water, soil and fertilizers. Known as the "DNA Multiscan", this proprietary technology will enable Laboratory Services to provide leading-edge services in Ontario (and across Canada) in support of plant health management.
- Laboratory Services provided immediate, emergency analytical support to OMAFRA staff on a number of high-priority investigations that were conducted during 2005/06.
- In continuing to collaborate with the CFIA, LS adopted CFIA methodology for the detection of Malachite/Leucomalachite Green residue in fish tissue. This allowed LS to provide the CFIA with some "over-run" capacity. The CFIA supported our effort to become the first Canadian laboratory to be accredited for this analysis by giving us status as a CFIA "Approved Laboratory" for this analysis. LS is reviewing the testing required by the fish import/export industry as a possible growth area.
- LS continued to respond to the needs of OMAFRA and other clients, for more rapid methodology in microbiology testing, e.g. *Listeria* detection using BioSys and chromogenic media, immunomagnetic separation methods for detection of *Salmonella*, *Listeria monocytogenes* and *E. coli* O157:H7 in foods, application of colorimetric and fluorometric methods for measurement of alkaline phosphatase in milk and dairy products to assess efficacy of pasteurization, and the use of PCR methodology for

detection of *Mycobacterium paratuberculosis* in raw and pasteurized milk. The shorter turn-around time provided by these methodologies allows more rapid response to the potential risks to public health posed by these microbial pathogens.

- LS also developed new DNA-based services in support of food safety:
  - PCR assays have been validated and installed for the detection of additional pathogenic bacteria and now include *Campylobacter*, *Shigella* and *Legionella* spp.;
  - A protein microarray for *Salmonella* serotyping has been developed that allows for rapid, cost-effective identification;
  - LS has recently developed a method for the detection of ruminant DNA and protein in feed and food. This analytical tool is now available to support efforts that guard against the transmission of diseases such as BSE.
- The 2005/06 Plum Pox Virus (PPV) project recorded its largest season ever. This marks the fifth year of this collaborative effort involving CFIA, Agricorp, OMAFRA and LS to eradicate PPV in Ontario.

### 3.3 Budget

The Laboratory Services Division (LS) provides testing and diagnostic services to public and private clients in the agriculture, food and veterinary industries. This report deals with those services that LS provides under the terms of the OMAFRA/UofG Agreement. The report describes the testing services provided to the Food Safety and Environment Division (FSED) and the Innovation and Competitiveness Division (ICD) of OMAFRA and the diagnostic services carried out on behalf of the Livestock Technology Branch of ARD.

Under the terms of the OMAFRA/UofG Agreement, the Laboratory Services Division receives funding for the specific testing services described previously. In addition, LS is required to earn sufficient additional income to replace and upgrade its infrastructure. To that end, LS provides testing, on a fee-for-service basis, to various clients in the public and private sector. It is estimated that LS must reinvest at least \$1.5 million per year in infrastructure replacement and upgrades in order to maintain the current level of capabilities to meet OMAFRA's testing requirements. This does not cover the needs for expansion of testing capabilities to deal with emerging problems and regulatory requirements. As needs evolve, additional investment is required to acquire the new technology to meet increasingly complex test requirements.

#### **Financial Results (for the year ended April 30, 2006) (\$ in millions of dollars)**

|                                       |  | <b>Actual<br/>04/05</b> | <b>Actual<br/>05/06</b> |
|---------------------------------------|--|-------------------------|-------------------------|
| <b>Expenditures</b>                   |  |                         |                         |
| Animal Health Lab                     |  | \$6.1                   | \$6.7                   |
| Analytical Services                   |  | 4.7                     | 4.8                     |
| Regulatory Services                   |  | 3.5                     | 3.8                     |
| I & S <sup>(1)</sup>                  |  | 3.0                     | 3.0                     |
| Reinvestment                          |  | 1.5                     | 1.6                     |
| <b>Total Expenses</b>                 |  | <b>\$18.8</b>           | <b>\$19.9</b>           |
| Revenue (external clients only)       |  | \$9.1                   | \$12.0                  |
| OMAFRA Funding                        |  | 9.0                     | 9.0                     |
| Carry forward surplus & other funding |  | 2.4                     | 1.7                     |
| <b>Total Funding</b>                  |  | <b>\$20.5</b>           | <b>\$22.7</b>           |
| Surplus/(Deficit)                     |  | \$1.7                   | \$2.8                   |

<sup>(1)</sup> Infrastructure and Support

- Lab Services Division enjoyed excellent financial results in 2005/06, significantly improved over the 2004/05 fiscal year.
- External revenues increased to \$12.0 million in 2005/06, an increase of \$2.9 million and 32% over previous year.
- The majority of the external revenue increase was due to an expanded Plum Pox Virus (PPV) project with the federal government in 2005/06 compared to the previous year.
- The AHL had an increase in external revenue of \$0.3 million in 2005/06 vs. 2004/05 mostly due to increased testing resulting from PRRSV, PCV2, and influenza virus outbreaks.
- Reinvestment in infrastructure and capabilities remained consistent with prior year at \$1.6 million. This represented the 6<sup>th</sup> consecutive year that LS has reinvested at least \$1.5 million back into the lab.

The total reinvestment in the last 6 years is \$13.5 million or an average of \$2.25 million per year. In 2006/07 reinvestment expenditures are expected to exceed \$2.5 million.

### 3.4 Reinvestment (\$'000's)

The table below details key reinvestments made in 2005/06. A detailed inventory of equipment including all new acquisitions is submitted to OMAFRA on a yearly basis. Major acquisitions are noted in the table.

| Reinvestment Item                    | Amount<br><i>(in million's of dollars)</i> |
|--------------------------------------|--------------------------------------------|
| LIMS system (AHL)                    | 0.6                                        |
| Necropsy suite (AHL) renovations     | 0.2                                        |
| Robotic Dairy sample system          | 0.1                                        |
| Protein Analyzer                     | 0.1                                        |
| Admin area renovations – 95 Stone Rd | 0.1                                        |
| Computer hardware replacement        | 0.1                                        |
| Other (less than \$100,000)          | 0.4                                        |
| <b>Total</b>                         | <b>\$1.6</b>                               |

### 3.5 Improvement Projects

The largest improvement project for LS in 2005/06 was the AHL LIMS system. The current software program used in the AHL is a system called VADDS. Late in 2004/05 the decision was made to replace VADDS. In 2005/06 the selection process was completed and Sapphire LIMS was chosen as the system to replace VADDS. The software was purchased in 2005/06 and the implementation was started late in 2005/06 and will be completed in the 2006/07 fiscal year. The costs incurred in 2005/06 were \$0.6 million and it is expected another \$1.0 million will be spent to complete the implementation. The Sapphire LIMS system purchased in 2005/06 is a newer version of the same system that was implemented in 2001/02 at 95 Stone Road.

In 2005/06 a new robotic dairy sample handling system was installed in the dairy lab at 95 Stone Road. This system replaced a manual scanning process for the login of sample information into the LIMS system. The benefits of the new robotic system are the following:

- Increased accuracy of the login of dairy sample information
- Increased speed of the login of dairy sample information
- Decreased repetitive strain injuries for staff in the dairy lab

The testing requirements for OMAFRA and other clients continue to evolve at a rapid pace. In order to meet OMAFRA/client needs LS put a significant portion of its improvement effort into developing and maintaining the tests required. Examples of the activities required are:

- the purchase and installation of high-capacity real-time PCR equipment and the ongoing development of new PCR based tests in the AHL
- the development of more rapid test to meet shorter turn around time requirements
- the requirement to accredit more tests to an ISO 17025 standard
- new DNA based services

See the highlights section 3.2 for more detail on the above improvement activities.

### 3.6 Accommodation and Planned Upgrades

Bio-security continues to be serious concern for the AHL, especially in light of emerging foreign animal diseases such as Avian Influenza. This concern will be key issue in the planning of a new shared facility for AHL and the Department of Pathobiology. Since the new building is still several years away, LS is taking an interim measure by renovating the necropsy suite in the AHL to enhance bio-security. The planning for the renovation was completed in 2005/06 and funds were transferred to U of G Physical Resources. The renovation will be completed in 2006/07.

The HVAC system repair at 95 Stone Road was not done in 2005/06. The HVAC project is being done by Ontario Realty Corp and is slated for 2006/07.

A renovation of the Admin office space at 95 Stone Road, to add office space, was completed in 2005/06. This was required due to an increase in the Admin staffing.

### 3.7 Quality Assurance

Laboratory Services maintained ISO accreditation to the 9001:2000 standard and expanded the scope of testing that is accredited to the ISO 17025 standard. Thirty-six new tests were added to the scope of accreditation. In addition, Laboratory Services became the only non-government laboratory to be accredited for test method development and non-routine testing. The water lab that was created in the previous year became licensed for water testing. The GLP status of the pesticide laboratory was confirmed.

The Animal Health Laboratory was audited by the American Association of Veterinary Laboratory Diagnosticians. Accreditation for full service was confirmed for 5 years. This accreditation is additional to the ISO status mentioned above.

### 3.8 Research Innovation & New Capabilities

#### 3.8.1 Innovation

The Laboratory Services Division is a service organization that provides laboratory services; as such, innovation for LS means improving processes (see 3.5 above) and developing new testing methods.

#### 3.8.2 New Capabilities

Lab Services is continually updating and developing new testing methods to met the emerging needs of OMAFRA and other clients. The following new methods were introduced during 2005/06.

#### **New Microbiological Test Required for OMAFRA Testing (2005/06)**

MID-202      Enumeration of *Enterobacteriaceae* in Food Using 3M <sup>™</sup> Petrifilm<sup>™</sup>  
*Enterobacteriaceae* Count Plates

#### **New Microbiological Test Required for Service Work (2005/06)**

MID-194      Procedure for the Isolation of *Salmonella* species by the Modified Semi-Solid Rappaport

Vassiliadis (MSRV) Method (MFLP-75)  
 MID-197 Enumeration of F+ and somatic coliphage in Environmental Samples  
 MID-198 Detection of enteroviruses in Environmental Samples

**New Dairy Procedures introduced by Laboratory Services (2005/06)**

DA-107 F4000 MSC & FM Results Validation  
 DA-602 DFO Milk Sample Log-In  
 DA-604 Verification: Blue Chip Temperature dataloggers  
 DA-606 Replacement samples for missing Producer Composition tests

**New Drug Residue Tests for OMAFRA Testing (2005/06)**

DRUGS-126 Charm II Tetracycline Test for Honey  
 DRUGS 127 Charm Enrofloxacin Test in Milk  
 DRUGS-128 Charm II Test for Novobiocin in Milk  
 DRUGS-129 Charm II Test for Tetracyclines in Milk  
 DRUGS-224 Sulfonamides in Honey by HPLC-Fluorescence  
 DRUGS-225 Tetracyclines in Honey by HPLC-UV

**New Food Chemistry Tests Introduced for Service Work (2005/06)**

FC-142 pH of Flour (AOAC 943.02)  
 FC-504 Isoflavones in Soybeans & Soy Food Products by HPLC  
 FC-509 Baicalin, Baicalein & Wogonin in Scutellaria  
 FC-512 Caffeic Acid Derivatives in Echinacea

**New Immunochemistry Tests Introduced for OMAFRA Testing (2005/06)**

IMC-411 Quantitative Detection of Vomitoxin in Cereal Samples by Enzyme Linked  
 Immunosorbent Assay (ELISA)  
 IMC-420 Quantitative Detection of Aflatoxin by ELISA  
 IMC-421 Quantitative Detection of T2 Toxin by ELISA  
 IMC-422 Quantitative Detection of Ochratoxin by ELISA  
 IMC-423 Quantitative Detection of Fumonisin by ELISA

**New Immunochemistry Tests Introduced for Service Work (2005/06)**

IMC-412 Quantitative Detection of Egg Protein by ELISA  
 IMC-413 Quantitative Detection of Milk Protein by ELISA  
 IMC-414 Quantitative Detection of Peanut Allergen by ELISA  
 IMC-416 Quantitative Detection of Gluten by ELISA  
 IMC-417 Quantitative Detection of Soy Allergen by ELISA  
 IMC-428 Quantitative Detection of Almond Allergen by ELISA

**New Chemical Residue Tests Introduced for OMAFRA Testing (2005/06)**

TOPS-117 Chlorophenols in Meat  
 SPR-002-V2.4 Confirmation of EBDC's in Fruits and vegetables thru the determination of EDA

**New Environmental Tests for Service Work (2005/06)**

SNL-031 Ammonium Acetate-extractable Potassium, Magnesium, Calcium and Sodium  
 SNL-032 DTPA-Extractable Copper, Iron and Zinc  
 SNL-033 Total Solids in Solutions  
 SNL-034 Cation Exchange Capacity  
 SNL-037 Specific Gravity

### **New Environmental Tests for Service Work (2005/06) - continued**

|          |                                                                                                                     |
|----------|---------------------------------------------------------------------------------------------------------------------|
| SNL-038  | Alkalinity 2320B Titration Method                                                                                   |
| SNL-039  | Metals-3120B Inductively Coupled Plasma (ICP) Method                                                                |
| SNL-040  | Phosphorous – 4500P                                                                                                 |
| SNL-041  | Metals – Preliminary treatment of samples – 3030E-Nitric Acid Digestion                                             |
| SNL-042  | Sulfate in drinking and surface waters, and domestic and industrial water wastes AQ2<br>Method No: EPA-123-A-Rev. 4 |
| SNL-112  | Chloride in Drinking, Saline and Surface Waters, and Domestic and Industrial Wastes<br>(EPA-105-A Rev.4)            |
| TOXI-049 | Nitrate-N in Drinking and Surface Waters, and Domestic and Industrial Wastes (EPA-<br>115A Rev. 3)                  |
| TOXI-050 | Ammonia-N in Drinking and Surface Waters, and Domestic and Industrial Wastes (EPA-<br>103A Rev. 4)                  |
| TOXI-051 | Ammonia-N in Drinking and Surface Waters, and Domestic and Industrial Wastes (EPA-<br>129A Rev. 3)                  |
| TOXI-052 | Nitrate-N Plus Nitrite-N in Drinking and Surface Waters, and Domestic and Industrial<br>Wastes (EPA-127A Rev. 4)    |
| TOXI-053 | Nitrite-N in Drinking and Surface Waters, and Domestic and Industrial Wastes (EPA-<br>1116A Rev. 3)                 |
| TOXI-054 | Phosphorous                                                                                                         |

### **New Tests in Molecular Biology (2005/06)**

|         |                                                                                                     |
|---------|-----------------------------------------------------------------------------------------------------|
| MOL-181 | <i>Mycoplasma bovis</i> Real-Time PCR (AHL)                                                         |
| MOL-183 | Swine Influenzae Virus Sequencing using Qiagen 1-Step RF PCR Kit and Phylogenetic<br>Analysis (AHL) |
| MOL-184 | Canine Distemper Virus Real-Time RT PCR (AHL)                                                       |
| MOL-185 | Parvovirus Real Time PCR (AHL)                                                                      |
| MOL-186 | <i>Mycoplasma haemofelis</i> & <i>haemominutum</i> PCR                                              |

### **New Food Animal Operating Procedures Introduced by the AHL (2005/06)**

|          |                                                 |
|----------|-------------------------------------------------|
| CLP-590  | Canine/Feline Heartworm Antigen                 |
| MMV-336  | Bio-X BCV Antigen ELISA                         |
| TOXI-026 | Trace Elements in Serum & Plasma by ICP-OES     |
| TSE-010  | Sample Receiving, Storage & Discard for TSE Lab |

### 3.9 Performance Measures

| Service Details          | Performance Measures and Targets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A. Animal Health</b>  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 1. Policy Development    | <p>OMAFRA determined needs for policy development and set / confirmed direction for disease surveillance, with input from LS as required</p> <p>OMAFRA informed LS of this direction annually and as soon as a change in direction was known to OMAFRA</p>                                                                                                                                                                                                                                                                                                                                                                                            | <p>As the lead agency in the Ontario Avian Influenza Working Group, OMAFRA supported increased capacity of the AHL to provide high-volume AIV testing should a highly pathogenic AIV outbreak occur.</p> <p>Yes.</p>                                                                                                                                                                                                                                                                                                                                    |
| 2. Laboratory Management | <p>LS managed resources, provided the required services and maintained scientific capacity at a level appropriate to OMAFRA needs while remaining within the funding allocation.</p> <p>LS maintained its AAVLD accreditation and ISO registration, and reported status to OMAFRA annually and immediately upon failing to maintain accreditation or registration.</p> <p>LS reported client service survey results from livestock, poultry and OMAFRA veterinarians to OMAFRA annually.</p> <p>In the annual client service survey, 90% of responding livestock, poultry and OMAFRA veterinarians judged LS performance as acceptable or better.</p> | <p>Yes, the AHL staffing complement was maintained at 15 veterinary specialists, 45 technical staff, and 5 clerical staff, plus ~20 FTE of part-time staff, for a total of ~85 FTEs.</p> <p>Yes, the AHL underwent an AAVLD site visit in Sept/04, and was granted full accreditation, all species, for 5 years, effective July/05, with no limitations.</p> <p>Yes, via the Nov 2005 annual client survey.</p> <p>Yes, all respondents were satisfied with AHL service, and 24% were delighted. All respondents will continue to use our services.</p> |
| 3a. Services             | LS provide OMAFRA with expected costs for services for animal health diagnostic priorities by April 30 each                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Yes, as noted in Schedule K mtgs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Service Details                 | Performance Measures and Targets                                                                                                                                                                                                                                                                                                                                                          | Comments                                                                                                                                                                                                                                                                                      |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 | <p>year.</p> <p>LS and OMAFRA collaborated to meet passive animal disease surveillance program objectives and remain within the funding allocation</p> <p>LS had no significant service failures that threaten the integrity of the database for passive surveillance.</p> <p>LS recorded and tracked service non-conformances as per ISO standards and reported to OMAFRA quarterly.</p> | <p>Yes.</p> <p>Correct.</p> <p>Yes.</p>                                                                                                                                                                                                                                                       |
| 3b. In-year Changes to Services | <p>LS submitted revised service costs within 4 weeks of receiving requests for in-year changes</p> <p>OMAFRA and LS were satisfied that in-year changes were handled appropriately and followed the defined procedures as set out in the Information Management Protocol.</p>                                                                                                             | <p>"In-year changes" are not typically made in our passive submission program, but requests are dealt with on a proposal basis, usually linked to an outbreak issue.</p> <p>Yes, see above.</p>                                                                                               |
| 3c. Emergency Preparedness      | OMAFRA and LS worked with CFIA and other agencies to begin the development of an emergency preparedness plan.                                                                                                                                                                                                                                                                             | Emergency preparedness plans in place.                                                                                                                                                                                                                                                        |
| 4. Maintain Accessibility       | OMAFRA and LS discussed priorities and issues related to accessibility and identified potential solutions to problems, quarterly.                                                                                                                                                                                                                                                         | Yes. Continued discussions about improving compliance with submission of demographic information; followed up with a March 2006 AHL Newsletter request and a sample completed submission form, plus a report on results of the OMAFRA demographics questionnaire in the June 2006 Newsletter. |
|                                 |                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                               |

| Service Details                          | Performance Measures and Targets                                                                                                                                                                                                                                                                | Comments                                                                                                                                                                        |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                          | LS delivered services in a manner which encouraged veterinarians to submit laboratory diagnostic submissions.                                                                                                                                                                                   | Maintained coverage of western and northern Ontario through the Guelph lab and eastern Ontario through the Kemptville lab. Filled the second full-time KC pathologist position. |
| 5. Development of New Test Methodologies | LS introduced new tests as required.                                                                                                                                                                                                                                                            | Enhanced existing tests and added new tests, particularly in the PCR and IHC areas, and updated client veterinarians through the quarterly AHL Newsletter.                      |
| 6. Professional Expertise                | LS maintained the scientific quality of its animal health diagnostic laboratory as demonstrated by continued accreditation by AAVLD.                                                                                                                                                            | Yes, see 2. above.                                                                                                                                                              |
| 7a. Reporting - Client Reports           | <p>OMAFRA veterinary scientists analyzed data and reported provincial disease trends to Ontario livestock and poultry sectors as appropriate.</p> <p>LS client service survey showed 90% of livestock and poultry veterinarians judged reporting as acceptable or better.</p>                   | <p>Yes.</p> <p>Yes, as recorded in the Nov 2005 annual client survey. AHL results are also now available via the Web.</p>                                                       |
| 7b. Third Party                          | <p>OMAFRA communicated test results to third parties as appropriate.</p> <p>LS obtained written permission from primary clients to communicate any test results to third parties.</p>                                                                                                           | <p>Yes.</p> <p>Yes.</p>                                                                                                                                                         |
| 7c. Reportable Disease                   | <p>OMAFRA communicated information about reportable, notifiable and significant disease incidents to the livestock sector and the public as appropriate.</p> <p>LS informed the provincial veterinarian and/or CFIA of reportable, notifiable or significant disease incidents immediately.</p> | <p>Yes.</p> <p>Yes, the AHL informed OMAFRA of 99 disease events in Ontario in 05/06, ranging from anthrax through influenza.</p>                                               |

| Service Details                   | Performance Measures and Targets                                                                                                                                                                                                                                                                                                                   | Comments                                                                                                                                                                                                                                                                                                             |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8. Information Management         | <p>LS submitted a summary of testing results annually and as required</p> <p>LS provided OMAFRA with on-line access to the diagnostic testing conducted at the AHL</p> <p>LS maintained raw data for 7 years</p> <p>OMAFRA and LS discussed IT systems appropriate for data collection and transfer and disease surveillance, as was warranted</p> | <p>Yes, annual Labstat (cases/procedures) report submitted, plus ad hoc searches.</p> <p>Yes, through SQL searches of the VADDS database.</p> <p>Yes</p> <p>Yes, consulted with OMAFRA regarding design of the new AHL LIMS (Sapphire) and data warehouse to ensure capture and storage of required information.</p> |
| 9a. Communications-Service Issues | OMAFRA and LS were satisfied that all incidents were communicated and dealt with appropriately.                                                                                                                                                                                                                                                    | Yes.                                                                                                                                                                                                                                                                                                                 |
| 9b. Dispute Resolution            | <p>LS recorded service non-conformances and initiated follow-up procedures as required to maintain ISO registration</p> <p>OMAFRA and LS were satisfied that issues were resolved and steps were taken to prevent further issues.</p>                                                                                                              | <p>Yes.</p> <p>Yes.</p>                                                                                                                                                                                                                                                                                              |
| 9c. Outreach                      | OMAFRA and LS implemented a mutually agreed upon approach for outreach to vets and industry.                                                                                                                                                                                                                                                       | Yes, both groups maintained active participation in a full range of veterinary and commodity organizations, e.g., OAPP, OABP, OASV, PIC, OPIC, OSHAB.                                                                                                                                                                |
| 9d. Meetings                      | OMAFRA and LS participated in meetings and were satisfied with the frequency and quality if them.                                                                                                                                                                                                                                                  | Yes, internal quarterly Schedule K mtgs attended, and ad hoc mtgs as required, plus external mtgs with OPIC, etc.                                                                                                                                                                                                    |
|                                   |                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                      |

| Service Details                                    | Performance Measures and Targets                                                                                                                                                                 | Comments                                                                                                                                                                                              |
|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10. Other Services                                 | <p>OMAFRA obtained separate and distinct agreements and sources of funding for additional services from LS.</p> <p>LS provided additional services as agreed upon with OMAFRA.</p>               | <p>Yes, the AHL gratefully received \$250K for the purchase of high-throughput real-time PCR equipment for avian influenza testing.</p> <p>Yes, AIV testing as above, BSE testing from abattoirs.</p> |
| 11. Investment in Infrastructure                   | LS demonstrated that infrastructure or capabilities improvements were achieved through re-investment over the previous year, and reported improvements and improvement plans to OMAFRA annually. | Yes, capital re-investment in the AHL continued at the usual rate of ~\$500K/yr, plus an additional >\$1M being invested in the new LIMS.                                                             |
| 12. Schedule "K"                                   | OMAFRA and LS goals and objectives were met and reported annually.                                                                                                                               | Yes, through quarterly and ad hoc meetings, and annual Labstat report of cases and procedures by animal species.                                                                                      |
| 13. PMA Performance Measure and Target Development | LS and OMAFRA agreed on charges to performance measures and targets for animal health diagnostic services by June 30 each year.                                                                  | Revisions to the PMAs are on hold until 2008.                                                                                                                                                         |
| <b>B. Plants, Soil and Water</b>                   |                                                                                                                                                                                                  |                                                                                                                                                                                                       |
| 1. Program Management                              | OMAFRA determined needs for policies and programs annually, and obtained input from LS as appropriate.                                                                                           | The newly created LS Schedule K Liaison position and the OMAFRA Laboratory Analyst continue to foster a synergistic approach to obtaining appropriate input from all parties.                         |
|                                                    |                                                                                                                                                                                                  |                                                                                                                                                                                                       |

| Service Details                          | Performance Measures and Targets                                                                                                                                                                                                                                                                                                                                                               | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2. Laboratory Management                 | <p>LS managed resources, provided the required services and maintained scientific capacity at a level appropriate to OMAFRA needs while remaining within the funding allocation.</p> <p>LS maintained ISO registration and critical accreditations, and reported status to OMAFRA annually and immediately upon failing to maintain registration, accreditation or certification.</p>          | <p>LS worked successfully with OMAFRA to meet the challenge of significant in-year-changes to testing programs.</p> <p>LS maintained all reg'n, accreditations &amp; certifications:</p> <ul style="list-style-type: none"> <li>• ISO 9000 : 2001 Registered</li> <li>• Canadian Assoc. of Environmental Analytical Laboratories (CAEAL) - currently accredited to a 17025 standard for 37 environmental tests</li> <li>• * Standard Council of Canada (SCC) - currently accredited to a 17025 standard 157 tests</li> </ul> |
| 3a. Program Sampling Plans - Development | <p>OMAFRA submitted testing specifications to LS by March 1 each year.</p> <p>LS submitted tests costs to OMAFRA by April 30 each year if OMAFRA met the March 1 deadline.</p> <p>OMAFRA and LS kept the costs of the plan within the allocation provided under the transfer payment and reported results annually.</p> <p>LS followed the testing methodology as agreed upon with OMAFRA.</p> | <p>Yes</p> <p>Yes</p> <p>Testing under Sch. K exceeded \$9.0 million. LS agreed to expand testing services to cover off the extra testing.</p> <p>LS worked collaboratively with OMAFRA to establish testing methodology to be used.</p>                                                                                                                                                                                                                                                                                     |
| 3b. In-year Changes to Plan              | <p>LS submitted revised test costs to OMAFRA within 4 weeks of receiving requests for in-year changes</p> <p>OMAFRA and LS were satisfied that in-year changes</p>                                                                                                                                                                                                                             | <p>During the final half of the year, the in-year-change process was quite complicated, at times requiring several iterations back and forth between OMAFRA and LS. As a result this process for some in-year changes needed more than 4 weeks to complete</p> <p>Yes</p>                                                                                                                                                                                                                                                    |

| Service Details        | Performance Measures and Targets<br>were handled appropriately.                                                                                                                                                                                                                                                                                           | Comments                                                                                                                                                                                                                                                                     |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3c. Additional Samples | <p>LS notified OMAFRA 2 to 4 weeks before sample test numbers were projected to reach 95% of sample plan #'s agreed upon in the sampling plan.</p> <p>OMAFRA provide funds to cover LS costs resulting from requested samples that exceeded plan cost limits.</p>                                                                                         | <p>In the majority of cases in the second half of the year, LS provided this information as required. LS endeavours to continue to meet this PM on an ongoing basis.</p> <p>Yes</p>                                                                                          |
| 4a. Sample Collection  | <p>OMAFRA and LS agreed upon criteria for sample submission quality.</p> <p>OMAFRA followed protocols to ensure that sample quality, with a result that LS reported on an annual basis no more than 1.0% of incoming samples as significant non-conforming.</p> <p>LS notified OMAFRA immediately after receiving significant non-conforming samples.</p> | <p>Yes</p> <p>OMAFRA sample quality met the criteria for this PMA on an annual basis.</p> <p>See above note.</p>                                                                                                                                                             |
| 4b. Sample Testing     | <p>LS recorded and tracked service non-conformances as per ISO standards, and reported in quarterly reports to OMAFRA.</p> <p>Non-conformances did not exceed 1.0% of test results reported. Non-conformances were calculated independently for each program area on an annual basis.</p>                                                                 | <p>LS has improved Lab Track, its quality non-conformance tracking database, this will enhance the problem solving process and result in the overall improvement of services.</p> <p>On an annual basis, LS non-conformances were less than 1% of test results reported.</p> |
| 4c. Sample Numbers     | <p>LS advised OMAFRA when sample submissions and testing deviated 5% from the sampling plan.</p>                                                                                                                                                                                                                                                          | <p>In the majority of cases in the second half of the year, LS provided this information as required. LS endeavours to continue to meet this PM on an ongoing basis.</p>                                                                                                     |

| Service Details                     | Performance Measures and Targets                                                                                                                                                                                                                                                                                                                                                             | Comments                                                                   |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| 4d. Information Management          | <p>OMAFRA and LS maintained information for 7 years.</p> <p>LS maintained its own database following ISO standards.</p> <p>OMAFRA and LS were satisfied that information was managed according to established protocols.</p>                                                                                                                                                                 | <p>Yes</p> <p>Yes</p> <p>Yes</p>                                           |
| 4e. Reporting Test Results          | <p>LS provided reports in the required format and within the agreed upon time frame.</p> <p>LS followed protocols for isolates/samples transfers to cooperating laboratories.</p> <p>LS informed OMAFRA immediately on obtaining results indicating public health hazards.</p> <p>OMAFRA and LS were satisfied with the communication and protocols developed for test result reporting.</p> | <p>TAT were met over 95% of the time.</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> |
| 4f. Action on Test Results          | OMAFRA took action on test results according to established protocols.                                                                                                                                                                                                                                                                                                                       | LS assumes that OMAFRA complied with this PMA.                             |
| 5a. Communications - Service Issues | OMAFRA and LS were satisfied that all incidents were communicated and dealt with appropriately.                                                                                                                                                                                                                                                                                              | Yes                                                                        |
| 5b. Dispute resolution              | LS recorded service non-conformances and initiated follow-up procedures as required to maintain ISO registration.                                                                                                                                                                                                                                                                            | Yes                                                                        |

| Service Details                                   | Performance Measures and Targets                                                                                                                                                                 | Comments                                                                                                         |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
|                                                   | OMAFRA and LS were satisfied that issues were resolved and steps were taken to prevent further issues.                                                                                           | Yes                                                                                                              |
| 5c. Third party                                   | OMAFRA and LS were satisfied that communications with third parties were dealt with appropriately.                                                                                               | Yes                                                                                                              |
| 5d. Meetings                                      | OMAFRA and LS participated in meetings and were satisfied with the frequency and quality of them.                                                                                                | Yes                                                                                                              |
| 6. Other Services                                 | OMAFRA obtained separate and distinct agreements and sources of funding for additional services from LS.                                                                                         | Yes, E.g. Additional Soil testing                                                                                |
|                                                   | LS provided additional services as agreed upon with OMAFRA.                                                                                                                                      | Yes                                                                                                              |
|                                                   |                                                                                                                                                                                                  |                                                                                                                  |
| 7. Investment in Infrastructure                   | LS demonstrated that infrastructure or capabilities improvements were achieved through re-investment over the previous year, and reported improvements and improvement plans to OMAFRA annually. | Yes, E.g. DNA MultiScan                                                                                          |
| 8. Schedule "K"                                   | OMAFRA and LS goals and objectives were met and reported annually.                                                                                                                               | Yes                                                                                                              |
|                                                   |                                                                                                                                                                                                  |                                                                                                                  |
| 9. PMA Performance Measure and Target Development | LS and OMAFRA agreed on changes to performance measures and targets for Plants, Soil and Water Laboratory Program by June 30 each year.                                                          | The current PMA's have been in place since 2003/2004 fiscal year and will remain so until renegotiation in 2008. |
|                                                   |                                                                                                                                                                                                  |                                                                                                                  |
| <b>C. FOOD</b>                                    |                                                                                                                                                                                                  |                                                                                                                  |
|                                                   |                                                                                                                                                                                                  |                                                                                                                  |

| Service Details                          | Performance Measures and Targets                                                                                                                                                                                                                                                                                                                                                               | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Program Management                    | OMAFRA determined needs for policies and programs annually, and obtained input from LS as appropriate.                                                                                                                                                                                                                                                                                         | The newly created LS Schedule K Liaison position and the OMAFRA Laboratory Analyst continue to foster a synergistic approach to obtaining appropriate input from all parties.                                                                                                                                                                                                                                                                                                                                              |
| 2. Laboratory Management                 | <p>LS managed resources, provided the required services and maintained scientific capacity at a level appropriate to OMAFRA needs while remaining within the funding allocation.</p> <p>LS maintained ISO registration and critical accreditations, and reported status to OMAFRA annually and immediately upon failing to maintain registration, accreditation or certification.</p>          | <p>LS worked successfully with OMAFRA to meet the challenge of significant in-year-changes to testing programs.</p> <p>LS maintained all reg'n, accreditations &amp; certifications:</p> <ul style="list-style-type: none"> <li>• ISO 9000 : 2001 Registered</li> <li>• Canadian Assoc. of Environmental Analytical Laboratories (CAEAL) - currently accredited to a 17025 standard for 37 environmental tests</li> <li>• Standard Council of Canada (SCC) - currently accredited to a 17025 standard 157 tests</li> </ul> |
| 3a. Program Sampling Plans - Development | <p>OMAFRA submitted testing specifications to LS by March 1 each year.</p> <p>LS submitted tests costs to OMAFRA by April 30 each year if OMAFRA met the March 1 deadline.</p> <p>OMAFRA and LS kept the costs of the plan within the allocation provided under the transfer payment and reported results annually.</p> <p>LS followed the testing methodology as agreed upon with OMAFRA.</p> | <p>Yes</p> <p>Yes</p> <p>The initial testing requested under Sch K exceeded \$9.0 million. LS agreed to expand testing services to \$9.1 million to cover off the extra testing.</p> <p>LS worked collaboratively with OMAFRA to establish testing methodology to be used.</p>                                                                                                                                                                                                                                             |

| Service Details             | Performance Measures and Targets                                                                                                                                                                                                                                                                                                                                      | Comments                                                                                                                                                                                                                                                    |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3b. In-year Changes to Plan | <p>LS submitted revised test costs to OMAFRA within 4 weeks of receiving requests for in-year changes</p> <p>OMAFRA and LS were satisfied that in-year changes were handled appropriately.</p>                                                                                                                                                                        | <p>During the final half of the year, the in-year-change process was quite complicated, at times requiring several iterations back and forth between OMAFRA and LS. This process for some in-year changes took more than 4 weeks to complete</p> <p>Yes</p> |
| 3c. Additional Samples      | <p>LS notified OMAFRA 2 to 4 weeks before sample test numbers were projected to reach 95% of sample plan #'s agreed upon in the sampling plan.</p> <p>OMAFRA provide funds to cover LS costs resulting from requested samples that exceeded plan cost limits.</p>                                                                                                     | <p>In the majority of cases in the second half of the year, LS provided this information as required. LS endeavours to continue to meet this PM on an ongoing basis.</p> <p>Yes</p>                                                                         |
| 4a. Sample Collection       | <p>OMAFRA and LS agreed upon criteria for sample submission quality.</p> <p>OMAFRA followed protocols to ensure that sample quality, with a result that LS reported no more than 0.1% of incoming samples as significant non-conforming in quarterly reports to OMAFRA.</p> <p>LS notified OMAFRA immediately after receiving significant non-conforming samples.</p> | <p>Yes</p> <p>Sample quality was a consistent issue throughout the year. This is an inherent challenge due to the nature of the perishable goods involved in this program.</p> <p>Yes</p>                                                                   |
| 4b. Sample Testing          | <p>LS recorded and tracked service non-conformances as per ISO standards, and reported in quarterly reports to OMAFRA.</p>                                                                                                                                                                                                                                            | <p>LS has improved Lab Track, its quality non-conformance tracking database, this will enhance the problem solving process and result in the overall improvement of services.</p>                                                                           |

| Service Details            | Performance Measures and Targets                                                                                                                        | Comments                                                                                                                                                          |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            | Non-conformances did not exceed 1.0% of test results reported. Non-conformances were calculated independently for each program area on an annual basis. | On an annual basis, LS non-conformances were less than 1% of test results reported.                                                                               |
| 4c. Sample Numbers         | LS advised OMAFRA when sample submissions and testing deviated 5% from the sampling plan.                                                               | In the majority of cases in the second half of the year, LS provided this information as required. LS endeavours to continue to meet this PM on an ongoing basis. |
| 4d. Information Management | OMAFRA and LS maintained information for 7 years.                                                                                                       | Yes                                                                                                                                                               |
|                            | LS maintained its own database following ISO standards.                                                                                                 | Yes                                                                                                                                                               |
|                            | OMAFRA and LS were satisfied that information was managed according to established protocols.                                                           | Yes                                                                                                                                                               |
| 4e. Reporting Test Results | LS provided reports in the required format and within the agreed upon time frame.                                                                       | Turnaround Times (TAT) were met over 95% of the time.                                                                                                             |
|                            | LS followed protocols for isolates/samples transfers to cooperating laboratories.                                                                       | Yes                                                                                                                                                               |
|                            | LS informed OMAFRA immediately on obtaining results indicating public health hazards.                                                                   | Yes                                                                                                                                                               |
|                            | OMAFRA and LS were satisfied with the communication and protocols developed for test result reporting.                                                  | Yes                                                                                                                                                               |
| 4f. Action on Test Results | OMAFRA took action on test results according to established protocols.                                                                                  | LS assumes that OMAFRA complied with this PMA.                                                                                                                    |

| Service Details                     | Performance Measures and Targets                                                                                                                                                                                                | Comments                                                                                                                        |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 5a. Communications - Service Issues | OMAFRA and LS were satisfied that all incidents were communicated and dealt with appropriately.                                                                                                                                 | Yes                                                                                                                             |
| 5b. Dispute Resolution              | LS recorded service non-conformances and initiated follow-up procedures as required to maintain ISO registration.<br><br>OMAFRA and LS were satisfied that issues were resolved and steps were taken to prevent further issues. | Please refer to Lab Track comment in 4b. above.<br><br>Yes                                                                      |
| 5c. Third Party                     | OMAFRA and LS were satisfied that communications with third parties were dealt with appropriately.                                                                                                                              | Yes                                                                                                                             |
| 5d. Meetings                        | OMAFRA and LS participated in meetings and were satisfied with the frequency and quality if them.                                                                                                                               | Yes                                                                                                                             |
| 6. Other Services                   | OMAFRA obtained separate and distinct agreements and sources of funding for additional services from LS.<br><br>LS provided additional services as agreed upon with OMAFRA.                                                     | E.g. Microbial Analysis Project of soft and firm cheeses.<br><br>Yes                                                            |
| 7. Investment in Infrastructure     | LS demonstrated that infrastructure or capabilities improvements were achieved through re-investment over the previous year, and reported improvements and improvement plans to OMAFRA annually.                                | Yes, E.g. Instrumentation - DNA Sequencer, Media Sterilizer<br>Yes, E.g. Method Development- 36 methods accredited to ISO 17025 |
| 8. Schedule "K"                     | OMAFRA and LS goals and objectives were met and reported annually.                                                                                                                                                              | yes                                                                                                                             |
| 9. Dairy                            | OMAFRA negotiated the terms and conditions of the testing program and advised LS about changes.                                                                                                                                 |                                                                                                                                 |

| Service Details                                             | Performance Measures and Targets                                                                                                                                                                                                                                                                                                                      | Comments                                                                                                                                                  |
|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                             | <p>OMAFRA and DFO were satisfied with LS's reporting of all results to DFO.</p> <p>LS conducted tests required for milk quality and composition under ISO quality standards.</p> <p>LS ensured the integrity of samples under its control as per ISO quality standards.</p> <p>OMAFRA took immediate action when DFO failed to pay program costs.</p> | <p>LS will continue to work with OMAFRA to address DFO's objectives of this program.</p> <p>yes</p> <p>yes</p> <p>No payment issues this fiscal year.</p> |
| 10. PMA<br>Performance<br>Measure and Target<br>Development | LS and OMAFRA agreed on charges to performance measures and targets for the FOOD Laboratory Program by June 30 each year.                                                                                                                                                                                                                             | It is our understanding that these have been in place since 2003/2004 fiscal year and will remain so until renegotiation in 2008.                         |

## 4. Other OMAFRA/U of G Agreement Performance Measures

In addition to the primary areas covered by the OMAFRA/U of G Agreement (Research, Diploma Education, Veterinary Clinical Education Program, and Laboratory Services), there are several other Performance Management Agreements (PMAs) that require reporting as part of the Annual Report. The objectives, performance measures and results for these PMAs are itemized below.

### Reporting (Finance and Business)

#### Budget

The University must annually present the budget to OMAFRA for the Research, Diploma Education and Training, Veterinary Clinical Education Program (VCEP) and Laboratory Services programs. The Budget was approved as part of the Business Plan.

#### Quarterly Management Reports

The University is to submit financial management reports to OMAFRA within 6 weeks after the end of each quarter for the Research, Diploma Education and Training, Veterinary Clinical Education Program (VCEP) and Laboratory Services programs. In addition, a Transfer Payment report is to be filed each time.

#### Business Plan

The University is to submit a business plan covering the four programs (Research, Diploma Education, VCEP, Laboratory Services) each year, encompassing a brief description of each program and sub-programs, changes required or anticipated to the program relative to the previous year, new partnerships being or to be developed, staffing changes that could impact on the deliverables under the Agreement, and facility accommodation issues. The University met this deadline in 2005/06 by submitting the draft business plan to OMAFRA on April 15<sup>th</sup>; after an extension had been granted to accommodate the submission of the budget to the U of G's Board of Governors. An Executive Financial Summary was requested by OMAFRA's Executive Committee to be developed and incorporated into the Business Plan prior to approval. This was completed in early September 2005 and subsequently approved by the Executive Committee in December 2005.

#### Trust Funds

The University is to submit reports on the '**Post-Retirement**' and '**Non-Pension Post-Retirement**' trust funds, as well as the '**Agreement Research Trust Fund**' (formerly the 'Partnership Research Trust Fund'), along with the quarterly management reports. The University maintained compliance with this PMA in 2004/05.

#### Physical Facilities and Assets

This section includes PMA's pertaining to:

- Annual reporting on **space utilization and rationalization**
- Submitting budgets and reporting annually on **operations and maintenance**, and updating of Schedule T as required
- Review of facilities, including annual submission of **facility deficiency reports** and plans for addressing short, medium and long-term deficiencies.
- Reporting **sub-tenancies**, annually
- Submitting annually an **Asset Inventory and Planned Disposition Report**, detailing date of acquisition, asset value, ownership, condition, items sold, traded in or otherwise disposed of and revenues generated; intended dispositions and/or replacements for the coming year, and **livestock**

**inventories.** With the exception of the livestock inventories (which are reported within this Annual Report), each of these entails reporting dates other than with the Annual Report.

## **Emergency Preparedness / Environmental Health and Safety**

### **Emergency Preparedness Plan (PMA #6 under Physical Facilities and Assets)**

The University is expected to maintain the Emergency Preparedness Plan, including provisions for review and update as required.

### **Health and Safety Management**

The University is to maintain a Safety Management System for all locations regarding compliance with relevant legislation, training requirements for all staff and students, record keeping and communication requirement and other health and safety provisions, with a goal of zero lost-time accidents.

### **Environmental Management**

The University is to ensure Environmental Management Plans are in place for all locations covering compliance with relevant legislation, management of incidents, identification of hazards associated with the programs, record keeping and communications, with a goal of zero incidents (spills, contamination, etc.).

The University's Environmental Health and Safety (EHS) department is responsible for the development and implementation of occupational health and safety and environmental protection policies, programs and initiatives. The University's Safety Policy Manual for Risk Management and Due Diligence (at <http://www.uoguelph.ca/ehs/index.htm>) contains all of the institution's safety policies and outlines safety program details. The University promotes the internal responsibility system for workplace safety management and regulatory compliance. EHS provides advice and services in this regard to members of the University community. In particular, front-line managers and supervisors are provided support and guidance for workplace safety performance and due diligence.

The University has an incident reporting policy (i.e. safety policy number 851.04.02 titled Injury and Incident Reporting) and an Emergency Response Plan (ERP). The University's Security Services Department co-ordinates emergency response actions and up-dates the emergency contact lists and response action plans on an on-going basis. All workplaces are required by institutional policies to have fire safety plans and local emergency procedures.

### **Indemnity and Insurance**

The University is required to submit certificates of all types of insurance to OMAFRA at the execution of the Agreement and submit renewal certificates as needed. The University has submitted the certificates in compliance with this PMA in 2005/06.

### **Non-OMAFRA Funding for Infrastructure**

Awards were received in 2005/06 for over \$2.95 million in non-OMAFRA funding for research infrastructure related to the OMAFRA research program objectives. A number of these funding awards were combined CFI (Canadian Foundation for Innovation), OIT (Ontario Innovation Trust) awards and matching contributions.

| <b><u>Description of Award</u></b>                                                                                                                                                                  | <b><u>Sponsor(s)</u></b> | <b><u>\$ Amount<br/>(000's)</u></b> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------|
| Soil moisture observation networks for hydrologic model development, drought monitoring and satellite calibration. (A. Berge, Geography)                                                            | CFI/OIT/matching         | \$371                               |
| Development of tools and technologies for water resources management and planning. (B. Gharabaghi, Engineering)                                                                                     | CFI/OIT/matching         | \$303                               |
| Infrastructure for the synthesis and structural characterization on DNA adducts. (R. Manderville, Chemistry & Biochemistry)                                                                         | CFI/OIT/matching         | \$324                               |
| Infrastructure for study of host-pathogen interactions. (A. Preston, Molecular & Cellular Biology)                                                                                                  | CFI/OIT/matching         | \$306                               |
| Development of farm animal models for testing and amelioration of hormonal treatments in women: Influences on ovarian function and consequences for fertility. (P. Bartlewski, Biomedical Sciences) | CFI/OIT/matching         | \$309                               |
| Pattern formation in the cerebellum: Deciphering the stripes. (C. Armstrong, Biomedical Sciences)                                                                                                   | CFI/OIT/matching         | \$312                               |
| Infrastructure for establishment of a body composition and energy metabolism (BCEM) laboratory. (A. Buchholz, Family Relations & Applied Nutrition)                                                 | CFI/OIT/matching         | \$399                               |
| Enhanced infrastructure for multi-media information and communication research for rural development. (H. Hambly, Environmental Design & Rural Development)                                         | CFI/OIT/matching         | \$110                               |
| Acquisition of a Confocal Laser Scanning Microscope for live imaging of sub-cellular responses to environmental stimuli. (J. Mathur, Plant Agriculture)                                             | CFI/OIT/matching         | \$311                               |
| Development of a comparative epilepsy program. (R. Poma, Clinical Studies)                                                                                                                          | CFI/OIT/matching         | \$202                               |
| <b>Total</b>                                                                                                                                                                                        |                          | <b>\$2.947</b>                      |

## 4.1 Intellectual Property

The University of Guelph, in partnership with OMAFRA, seeks to bring research discoveries that have commercial potential to practical application with a particular emphasis on benefiting Ontarians and Canadians. The intellectual property section of this report records the status of commercialization of research discoveries that have benefited from OMAFRA funding. Once researchers identify discoveries as having potential commercial value, the Business Development Office (BDO) at the University evaluates the market potential and whether formal intellectual property protection is possible and then assists in obtaining funding to develop these to the point that uptake is possible by industry. BDO then negotiates licenses or, more rarely, assists in company formation. Our goal is to maximize and balance benefits to researchers, the institutions, business and society. The bulk of our licenses are to Canadian companies; the goal of licenses to foreign companies is to generate revenue from sales abroad that can be reinvested in programs in Ontario and to facilitate access to research tools in the advancement of science.

### Aggregate financial information

OMAFRA (on behalf of ARIO) and the University share revenues (usually royalties) and expenses (usually legal fees for IP protection) associated with commercialization projects in proportion to funding that each provides to the project that generated the discovery. The IP portfolio consists of 2 parts - germplasm (plant cultivars) and non-germplasm technologies. During the University's fiscal year ending April, 2006 it remitted \$321,083 in revenues to OMAFRA from non-germplasm discoveries and OMAFRA also received \$355,046 in germplasm revenues for a total of \$676,129. This compares to \$119,662 in non-germplasm revenue and \$489,167 from germplasm for a total of \$608,829 in the previous period. It should be noted that the germplasm revenue from the previous year included \$122,687 in collections of unpaid royalties from years prior to that. If this one time collection is eliminated, revenues grew by 15% over prior years. However, it should be noted that now that seed companies are being expected to support breeding programs and research stations previously funded almost entirely from public sources, germplasm revenue can be expected to plateau as those private sector partners will expect to recoup those investments via additional rights or lower license fees. The OMAFRA share of expenses was \$5,717 on the germplasm portfolio (versus \$5,649 last year) and \$73,878 on the rest of the portfolio (versus \$23,475 last year).

It should be noted that germplasm royalties were received in the year on 137 plant cultivars - the distribution being 54.8% soybean, 11.9% cereals, 10.3% maize, 8.8% white bean, 2.4% forages, 2.2% asparagus and the remainder consisted of canola, apple rootstock, strawberries and tree fruits. Royalties were received on 8 non-germplasm technologies, the largest amounts being from a cattle vaccine and a milk technology.

### Disclosures of New Inventions

The commercialization and protection process begins with disclosure by researchers of novel inventions that might have commercial value. Disclosures from projects which OMAFRA had contributed funding rose in fiscal 2006 to 137 (versus 152 to the University as a whole) from 87 (versus 106 to the university as a whole) in the previous year. 126 of the 137 disclosures were new plant cultivars (germplasm) – 2 barley, 23 maize, 1 oat, 34 soybean, 61 tomatoes and 5 wheat varieties. Of the 11 non-germplasm disclosures, 3 related to genetic markers for boar taint, 2 were methods for increasing or controlling pungency in alliums and the other 6 included isolation of a DHA producing bacteria, a natural health product, a viral vector and methods to predict crop stress tolerance, to increase the shelf life of fresh flowers, and to make paper bioactive for pathogens capture and detection.

**Table 4.1 Germplasm Disclosures:**

| Disclosures     |           |       |       |           |       |             |
|-----------------|-----------|-------|-------|-----------|-------|-------------|
| Fiscal year     | 2006      |       |       | 2005      |       | Fiscal year |
|                 | Germplasm | other | total | Germplasm | other | Total       |
| All disclosures | 126       | 26    | 152   | 82        | 24    | 106         |
| OMAFRA related  | 126       | 11    | 137   | 82        | 5     | 87          |

Fiscal 2006 (ended March 31<sup>st</sup>) germplasm disclosures consisted of 2 barley, 23 maize, 1 oat, 34 soybean, 61 tomatoes and 5 wheat varieties.

#### **New License Activity:**

There were 37 new licenses, one option and one inter-institutional agreement governing a joint venture in which OMAFRA has an interest executed in 2006. Of these, 35 were new germplasm licenses - 29 exclusive licenses to Canadian companies, 3 exclusive licenses to non-Canadian companies and 3 non-exclusive licenses to non-Canadian companies. There were 2 exclusive licenses of non-germplasm patents and technology to foreign companies - one for substantial improvement of company owned IP, the other for biological materials for making a vaccine to be sold in foreign jurisdictions. The option was to a Canadian company of 2 patent families previously licensed to a venture capital funded company after the latter license was cancelled. The joint venture was for jointly owned technology that is being commercialized via non-exclusive licenses for software incorporating the technology.

## **4.2 IP Protection and Status**

OMAFRA had an interest in 13 of the 26 new patent applications that the University filed in the last fiscal year. 2 of these were provisional applications filed in the US, one was a Patent Cooperation Treaty filing (generally made 1 year after the filing of a provisional application) and the rest were regular applications – 4 in the US, 1 in each of Europe and Canada and the rest in other countries. 1 patent (Australian) issued in the year in which OMAFRA had an interest of the 6 that issued to the University. The markedly lower number of patent applications as compared to disclosures relates to several factors, the largest of which is that patent applications on plant cultivars are not permitted in Canada and have restricted value in relation to costs in the US. Instead, commercial rights for the use of plant cultivars are controlled by contracts and Material Transfer Agreements. We also file Plant Breeders' Rights ("PBR") applications, which give very limited protection, only if a licensee believes these rights will be useful to it in marketing and dissemination/sale. Increasingly, licensees pay for new PBR filings out of royalties. 4 PBR applications were filed during the fiscal year; 3 were issued.

The second reason for the low level of patent filings in relation to the number of disclosures is that many of the disclosures other than plant cultivars were so early stage that further work is required to support potential claims before filings can be made. In some cases this requires genetic sequencing; in another the results of early human trials must be evaluated. OMAFRA had an interest in 43 issued patents – 4 Canadian, 17 US and the rest other countries as compared to 46 last year as some unlicensed patents were allowed to lapse. 18 of 43 were licensed; a drop almost entirely due to the fact that an optionee cancelled its option and the related research contract after it was purchased by another company. BDO is working

with a private group to commercialize this technology that has presented a commercialization plan based on a non-exclusive licensing model to make it less expensive for any one company to receive the benefits.

Plant cultivars ownership is maintained by the universities as all cultivars may have breeding potential. There have been more than 1,800 varieties disclosed over the years. The status of individual, non-germplasm technologies is as follows:

#### Non-Germplasm Portfolio by Technology

| <b>Tech ID</b>         | <b>Title</b>                                                                                                                                           | <b>Tech Status</b>                                                            |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Baird<br>20011109      | JEB diagnostic test for Belgian horses                                                                                                                 | Licensed - Non-Exclusive                                                      |
| Bettger<br>20031010    | Cow's milk fortified with nervonic acid by natural in vivo fortification                                                                               | Abandoned - no industry interest; lack of research to increase value          |
| Bettger<br>20040218    | Nervonic acid consumption                                                                                                                              | Marketing - early stage needs more research                                   |
| Betts<br>20051114      | Canine embryonic stem cell lines                                                                                                                       | Materials being evaluated by a company                                        |
| Bienzle<br>20050331    | A test to detect erythropoietin (EPO) treatment of horses                                                                                              | Test not feasible at track or on stored blood - returned for further research |
| Buhr<br>19980406       | Reduction of Sperm Sensitivity to chilling/freezing                                                                                                    | Term Sheet was completed                                                      |
| Carman<br>20010628     | Virulent Noncytopathic Type 2 Bovine Viral Diarrhea Virus (BVDV) Strain 24515                                                                          | Marketing -                                                                   |
| Carman<br>20010628-2   | Cytopathic Type 2 Bovine Viral Diarrhea Virus (BVDV) Strain 53637                                                                                      | Licensed - Non-Exclusive                                                      |
| de Lange<br>20050221   | Pig Growth Model                                                                                                                                       | joint venture with joint owner - product now on market                        |
| Derbyshire<br>19890502 | Recombinant fowlpox virus (rFPV) and Recombinant baculovirus (rBV) expressing the HN gene of Newcastle disease virus                                   | MTA with company who is still using materials                                 |
| Deveau<br>20020426     | Injection-Port Chamber for the Single-Barrel Silanization of Multibarrel Ion-Selective Microelectrodes                                                 | License and sub-license terminated                                            |
| Dixon<br>20030526      | Hypobaric plant growth chambers for plant studies under reduced atmosphere and variable pressure                                                       | License and sub-license terminated                                            |
| Dixon<br>20060328      | A Protocol for Using Aqueous Ozone to Extend the Shelf-life                                                                                            | Details of use for roses published, info on new crops needed to create value  |
| Doran<br>20030329-2    | Method for the preparation of concentrated allium flavour extracts                                                                                     | In Evaluation                                                                 |
| Doran<br>20030329-3    | Protocol for employing oxidative stress in a controlled environment as to stimulate secondary product formation in high-value crops, such as the onion | In Evaluation                                                                 |
| Erickson<br>20010524   | Novel Inducible Genes from Alfalfa and Methods of Use Thereof                                                                                          | Licensed - non-exclusive                                                      |
| Etches<br>19970306     | The use of germ-line competent (GLC) cells to produce germ-line chimeric chickens.                                                                     | Abandoned                                                                     |

|                         |                                                                                                                                                                                        |                                                             |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| Etches<br>19970425      | Production of Human Immunoglobulins in Chicken Eggs                                                                                                                                    | Licensed - Exclusive                                        |
| Forsberg<br>19990526    | Transgenic animals expressing salivary phytase                                                                                                                                         | Marketing                                                   |
| Griffiths<br>20060428-1 | Cloning and Production of recombinant omega-3 polyunsaturated fatty acid (docosahexaenoic acid)                                                                                        | In Evaluation                                               |
| Griffiths<br>20060428-2 | Method for bacteria concentration and detection based on immobilized recombinant bacteriophage                                                                                         | In Evaluation                                               |
| Holub<br>19960430       | Custom Feed Supplement to Maximize Omega-3 Fatty Acids in Cow's Milk                                                                                                                   | Licensed - Exclusive                                        |
| Holub<br>19980622       | Garlic Processing Technique                                                                                                                                                            | Licensed - Exclusive                                        |
| Kasha<br>19980429       | Embryogenesis and Plant Regeneration from Microspores                                                                                                                                  | Marketing                                                   |
| Kott<br>20060221        | Natural health product with possible effect on asthma and allergic rhinitis                                                                                                            | Accepted - planning patent                                  |
| Mallard<br>079981       | Method of identifying high immune response periparturient animals                                                                                                                      | Not licensed                                                |
| McGurrin<br>20040402    | Pressure and ultrasound-guided cardiac catheter for transvenous electrical cardioversion of equine supra-ventricular cardiac arrhythmias                                               | Licensed                                                    |
| Mckersie<br>19870324    | Process to induce desiccation tolerance in somatic embryos                                                                                                                             | Licensed                                                    |
| Mckersie<br>19971215    | Enhanced Root Production in Transgenic Perennial Plants                                                                                                                                | Licensed - Non-Exclusive                                    |
| Nagy<br>20000817        | Porcine Adenovirus Based Vector, Vaccine                                                                                                                                               | Licensed                                                    |
| Nagy<br>20030530        | Fowl Adenovirus (FAdV) based vaccine for Poultry; FAdV based expression vector for Gene Delivery                                                                                       | Licensed                                                    |
| Nagy<br>20051115        | Fowl Adenovirus (FAdV) based helper independent multivalent vaccine. FAdV based expression vector for gene delivery                                                                    | Needs additional results for patent application             |
| O'Brien<br>19900111     | Diagnosis for Porcine Malignant Hyperthermia                                                                                                                                           | Licensed - Non-Exclusive                                    |
| Paliyath<br>19980831    | Inhibition of Phospholipase D activity by C6 Aldehydes and Alcohols                                                                                                                    | optioned                                                    |
| Paliyath<br>20000517    | Development of a Novel Antioxidant Formulation to Control Superficial Scald in Apples                                                                                                  | Optioned                                                    |
| Pauls<br>20040630       | Bean Phenylpropanoid Pathway Microarray                                                                                                                                                | Being reconsidered                                          |
| Plante<br>20000810      | Porcine Embryo Production, Recovery, Maintenance and Transfer Systems for Use in Domestic and International Genetic Transport and the Elimination of Environmental Pathogens in Swine. | Licensed - Non-Exclusive                                    |
| Prescott<br>20041004    | <i>Rhodococcus equi</i> vaccine                                                                                                                                                        | Clinical trials unsuccessful. Returned for further research |
| Saxena<br>19981216      | Micropropagation technologies for phytopharmaceutical: St. John's Wort                                                                                                                 | Re-marketing after previous option terminated               |

|                       |                                                                                                                                                       |                                     |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Shewen<br>19850207    | Vaccine for Prevention of Pasteurella haemolytica pneumonia in Cattle.                                                                                | Licensed - Exclusive                |
| Shewen<br>20040604    | An edible vaccine stimulating immune response in cattle to antigens of Mannheimia haemolytica, the principal cause of bovine pneumonic pasteurellosis | Option exercised                    |
| Squires<br>19961016   | Method for Identifying Pigs with Genetically Reduced Levels of Boar Taint Steroids                                                                    | Marketing after option relinquished |
| Squires<br>19971128   | Genetic Markers for Pigs with Low Skatole (P450IIE)                                                                                                   | Marketing after option relinquished |
| Squires<br>19990921   | Identification of Metabolites and Key Enzymes in Skatole Metabolism in Liver                                                                          | Marketing after option relinquished |
| Squires<br>20030825   | Genetic Marker for Boar Taint in Sulphur Transferase                                                                                                  | Marketing after option relinquished |
| Squires<br>20050616   | Porcine Sulfortransferase 2A1                                                                                                                         | Marketing after option relinquished |
| Squires<br>20060323-1 | Genetic Markers in Nuclear Receptor Genes for Boar Taint                                                                                              | Marketing after option relinquished |
| Squires<br>20060323-2 | Genetic Markers in 8 Genes for Boar Taint                                                                                                             | Marketing after option relinquished |
| Swanton<br>20060321   | Genetic basis for increased stress tolerance of plants to changes in light quality                                                                    | In Evaluation                       |

## 5. Financial Summary

### 5.1 Introduction:

Following the format first introduced in the 2004/2005 Annual Report, the financial data have been presented as 'Fully Allocated Costs' for each of the programs. In this presentation format, the 'indirect costs' (such as operating research stations and providing student support services, administrative services such as budget management and human resources functions, and campus physical plant infrastructure) have been allocated to each individual program and sub-program using a consistent methodology to arrive at the reported 'Fully Allocated Cost by Program/Sub-program'. (In the past, the indirect costs were shown as 'Infrastructure & Support' costs in the tables showing the program and overall Agreement costs).

Consequently, the 2005/06 Annual Report includes tabular presentation of the **Fully Allocated Costs** for:

- The overall Agreement, broken down by Program area (Table 5.1.1), including graphic presentation of this data (Figures 1, 2 & 3)
- The Research Program, broken down by sub-program area (Table 5.1.2.)
- The Education Program, including the Diploma Program broken down by sub-program area (Agriculture, Horticulture, etc.) and Continuing Education / Business Development and Training Costs (Table 5.1.3.)
- The Laboratory Services Program broken down by major expense categories (Table 5.1.4.)
- The VCEP Program with details of expenditures by program objective. (Table 5.1.5)

This Fully Allocated Costs presentation format provides a much more informative arrangement of the financial data, improves clarity and comparability of program costs. Nevertheless, it is not advisable to use these data in isolation 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 'Sustainable Production Systems sub-program' expenditures may have less impact than intended, unless the continuing cost of operating the research stations on which the program is built is also part of the decision process).

As noted above, the Fully Allocated Program (FAP) Costs presentation of data was initiated with the 2004/2005 Annual Report. Since this provides a direct year-to-year comparison based on the same methodology, the previous format of reporting 'direct program costs' plus a separate listing of 'infrastructure and support' costs within each program and sub-program has now been eliminated from this report.

**Table 5.1.1: OMAFRA Program Summary - 2005/2006 Fully Allocated <sup>1)</sup> Expenditures and Revenues by Program and Location (in thousands of dollars)**

| Program Area                                                     | Alfred  |         | Kemptville |         | Ridgetown |         | Lab Services Div. |         | Guelph  |         | TOTAL    |          |
|------------------------------------------------------------------|---------|---------|------------|---------|-----------|---------|-------------------|---------|---------|---------|----------|----------|
|                                                                  | '05/'06 | '04/'05 | '05/'06    | '04/'05 | '05/'06   | '04/'05 | '05/'06           | '04/'05 | '05/'06 | '04/'05 | '05/'06  | '04/'05  |
| <b>Research</b>                                                  |         |         |            |         |           |         |                   |         |         |         |          |          |
| Total Expenses                                                   | 125     | 183     | 2,620      | 2,488   | 3,061     | 2,761   | -                 | -       | 28,564  | 27,614  | 34,371   | 33,046   |
| Revenues                                                         | (0)     | (31)    | (413)      | (407)   | (304)     | (110)   | -                 | -       | (2,433) | (2,659) | (3,150)  | (3,207)  |
| <b>Net Expenses *</b>                                            | 125     | 152     | 2,208      | 2,081   | 2,757     | 2,651   | -                 | -       | 26,131  | 24,955  | 31,221   | 29,839   |
| <b>Diploma Education</b>                                         |         |         |            |         |           |         |                   |         |         |         |          |          |
| Total Expenses                                                   | 2,258   | 2,266   | 3,266      | 2,872   | 3,753     | 3,956   | -                 | -       | 354     | 299     | 9,631    | 9,393    |
| Revenues                                                         | (457)   | (481)   | (2,109)    | (1,987) | (2,584)   | (2,586) | -                 | -       | (261)   | (267)   | (5,411)  | (5,321)  |
| <b>Net Expenses *</b>                                            | 1,801   | 1,785   | 1,157      | 885     | 1,168     | 1,370   | -                 | -       | 93      | 33      | 4,220    | 4,072    |
| <b>Continuing Ed. / Bus/ dev. &amp; Training</b>                 |         |         |            |         |           |         |                   |         |         |         |          |          |
| Total Expenses                                                   | 1,291   | 1,138   | 3,129      | 2,763   | 2,498     | 2,127   | -                 | -       | -       | -       | 6,918    | 6,028    |
| Revenues                                                         | (480)   | (762)   | (2,345)    | (2,019) | (2,440)   | (2,226) | -                 | -       | -       | -       | (5,265)  | (5,007)  |
| <b>Net Expenses *</b>                                            | 811     | 376     | 784        | 744     | 58        | (99)    | -                 | -       | -       | -       | 1,653    | 1,021    |
| <b>Veterinary Clinical Education Program (VCEP)</b>              |         |         |            |         |           |         |                   |         |         |         |          |          |
| Total Expenses                                                   | -       | -       | -          | -       | -         | -       | -                 | -       | 4,755   | 4,788   | 4,755    | 4,788    |
| Revenues                                                         | -       | -       | -          | -       | -         | -       | -                 | -       | -       | 4       | -        | 4        |
| <b>Net Expenses *</b>                                            | -       | -       | -          | -       | -         | -       | -                 | -       | 4,755   | 4,792   | 4,755    | 4,792    |
| <b>Laboratory Services</b>                                       |         |         |            |         |           |         |                   |         |         |         |          |          |
| Total Expenses                                                   | -       | -       | -          | -       | -         | -       | 20,169            | 19,128  | -       | -       | 20,169   | 19,128   |
| Revenues                                                         | -       | -       | -          | -       | -         | -       | (12,023)          | (9,120) | -       | -       | (12,023) | (9,120)  |
| <b>Net Expenses *</b>                                            | -       | -       | -          | -       | -         | -       | 8,146             | 10,008  | -       | -       | 8,146    | 10,008   |
| <b>Total - All Programs, excluding Minor Capital Repair Fund</b> |         |         |            |         |           |         |                   |         |         |         |          |          |
| Total Expenses                                                   | 3,674   | 3,587   | 9,015      | 8,123   | 9,312     | 8,844   | 20,169            | 19,128  | 33,673  | 32,701  | 75,844   | 72,383   |
| Revenues                                                         | (937)   | (1,274) | (4,866)    | (4,413) | (5,328)   | (4,923) | (12,023)          | (9,120) | (2,694) | (2,921) | (25,849) | (22,651) |
| <b>Net Expenses *</b>                                            | 2,737   | 2,313   | 4,149      | 3,710   | 3,984     | 3,921   | 8,146             | 10,008  | 30,979  | 29,780  | 49,995   | 49,733   |
| <b>OMAFRA Minor Capital Repair Fund <sup>2)</sup></b>            |         |         |            |         |           |         |                   |         |         |         |          |          |
| Total Expenses                                                   | 66      | 48      | 90         | 419     | 137       | 164     | -                 | -       | 1,102   | 1,357   | 1,395    | 1,987    |
| Revenues                                                         | (45)    | (69)    | (90)       | (418)   | (137)     | (164)   | -                 | -       | (892)   | (1,528) | (1,164)  | (2,179)  |
| <b>Net Expenses *</b>                                            | 21      | (21)    | -          | 1       | -         | -       | -                 | -       | 210     | (172)   | 231      | (191)    |
| <b>Total - All Programs, including Minor Capital Repair Fund</b> |         |         |            |         |           |         |                   |         |         |         |          |          |
| Total Expenses <sup>3)</sup>                                     | 3,741   | 3,635   | 9,105      | 8,542   | 9,449     | 9,008   | 20,169            | 19,128  | 34,775  | 34,058  | 77,239   | 74,370   |
| Revenues                                                         | (983)   | (1,343) | (4,956)    | (4,831) | (5,464)   | (5,086) | (12,023)          | (9,120) | (3,586) | (4,450) | (27,013) | (24,829) |
| <b>Net Expenses *</b>                                            | 2,758   | 2,292   | 4,149      | 3,711   | 3,984     | 3,921   | 8,146             | 10,008  | 31,189  | 29,608  | 50,226   | 49,541   |

\* Net Expenses represents the OMAFRA transfer payment contribution to that program/location.

<sup>1)</sup> Program Service Costs and Institutional Infrastructure and Support costs have been allocated to each of the sub-programs to demonstrate the 'all-in' (i.e., Fully Allocated) costs for each program/location.

<sup>2)</sup> As of year-end 04/05 a few OMAFRA Minor Capital projects had not had funds fully expended due to delayed delivery and completion. All of these projects were fully expended in the first few months of 2005/06 bringing the net expenses for the Minor Capital Repair program to 0 (at each location and overall).

<sup>3)</sup> A portion of the Agreement Service Costs (\$6,410 in total for 05/06) were allocated to each location as part of the 'fully allocated costs' methodology.

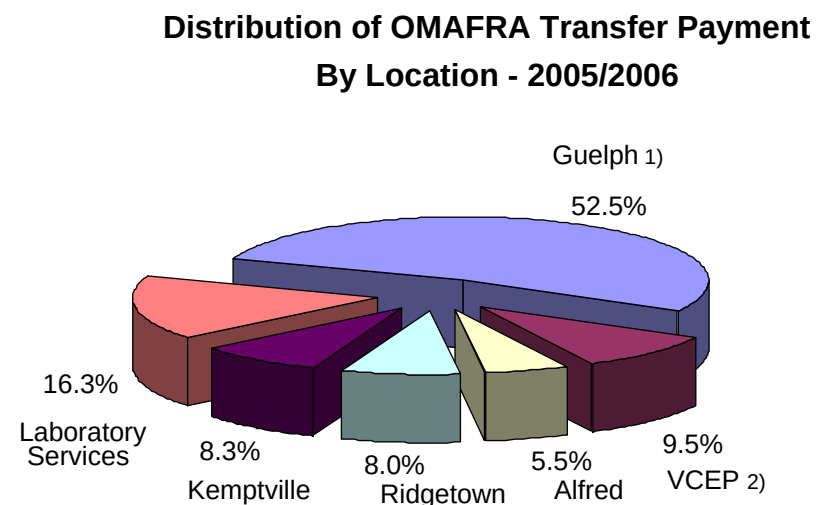
## Distribution of Transfer Payment (excluding Capital Funds) in 2005/2006

This presentation shows the net actual expenditures (i.e., total expenses less revenues) of OMAFRA transfer funds, by location for 2005/06. The values presented reflect carry-forwards of any unspent funds from fiscal 2004/05.

The initial transfer of funds under the OMAFRA University of Guelph Agreement was \$50.5 million in 2005/06. The total net expenditure for 2005/06 was \$49.995 million, excluding Capital Program costs. (Refer to Table 5.1.1). Any unspent Agreement funds are accounted for at the end of the fiscal year and carried forward to the following year's approval budget.

**Figure 1. Distribution of Transfer Payment 2005/2006 by Location (Fully Allocated Net Program Costs, excluding Capital Program Costs) <sup>(3)</sup>**

| Location                 | <u>2005 / 2006</u>                        |            | <u>2004 / 2005</u>                        |      |
|--------------------------|-------------------------------------------|------------|-------------------------------------------|------|
|                          | <u>Net Program Costs</u><br>\$ (millions) | %          | <u>Net Program Costs</u><br>\$ (millions) | %    |
| Guelph <sup>1)</sup>     | 26.2                                      | 52.5       | 25.0                                      | 50.2 |
| VCEP <sup>2)</sup>       | 4.8                                       | 9.5        | 4.8                                       | 9.6  |
| Alfred                   | 2.7                                       | 5.5        | 2.3                                       | 4.7  |
| Ridgetown                | 4.0                                       | 8.0        | 3.9                                       | 7.9  |
| Kemptville, New Liskeard | 4.2                                       | 8.3        | 3.7                                       | 7.5  |
| Laboratory Services      | 8.1                                       | 16.3       | 10.0                                      | 20.1 |
| <i>Total:</i>            | <b>50.0</b>                               | <b>100</b> | 49.7                                      | 100  |



<sup>(1)</sup> Includes expenditures for research stations at Arkell, Elora, Ponsonby, Woodstock and Guelph Turfgrass Institute, former HRIO locations (Vineland, Simcoe, Bradford) and all Guelph campus research and diploma education activities.

<sup>(2)</sup> Veterinary Clinical Education Program

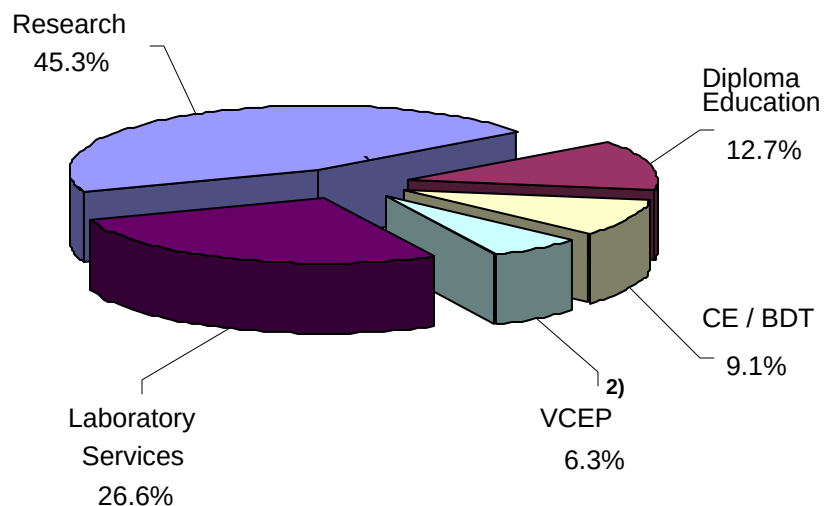
<sup>(3)</sup> The OMAFRA transfer represents gross expenditures less program-based revenues received during the fiscal year.

Note: These Figures exclude Minor Capital Repair Fund.

**Figure 2: Fully Allocated Gross Expenditures by Program (excluding Capital Costs) - 2005 / 2006**

| Location               | Fiscal 2005 / 2006         |            |                                |            | Fiscal 2004 / 2005         |            |                                |            |
|------------------------|----------------------------|------------|--------------------------------|------------|----------------------------|------------|--------------------------------|------------|
|                        | Gross Program Expenditures |            | OMAFRA Transfer <sup>(3)</sup> |            | Gross Program Expenditures |            | OMAFRA Transfer <sup>(3)</sup> |            |
|                        | \$<br>(millions)           | %          | \$<br>(millions)               | %          | \$<br>(millions)           | %          | \$<br>(millions)               | %          |
| Research               | 34.4                       | 45.3       | 31.2                           | 62.4       | 33.0                       | 45.6       | 29.8                           | 60.0       |
| Diploma Education      | 9.6                        | 12.7       | 4.2                            | 8.4        | 9.4                        | 13.0       | 4.1                            | 8.2        |
| CE / BDT <sup>1)</sup> | 6.9                        | 9.1        | 1.7                            | 3.3        | 6.0                        | 8.3        | 1.0                            | 2.0        |
| VCEP <sup>2)</sup>     | 4.8                        | 6.3        | 4.8                            | 9.5        | 4.8                        | 6.6        | 4.8                            | 9.7        |
| Lab. Services          | 20.2                       | 26.6       | 8.1                            | 16.3       | 19.1                       | 26.5       | 10.0                           | 20.1       |
| <i>Total:</i>          | <b>75.8</b>                | <b>100</b> | <b>50.0</b>                    | <b>100</b> | <b>72.4</b>                | <b>100</b> | <b>49.7</b>                    | <b>100</b> |

**Gross OMAFRA / U of G Program Gross Expenditures  
(Fully Allocated) by Program - 2005 / 2006**



**Distribution of OMAFRA Transfer <sup>(3)</sup> Payment by Program  
2005 / 2006**

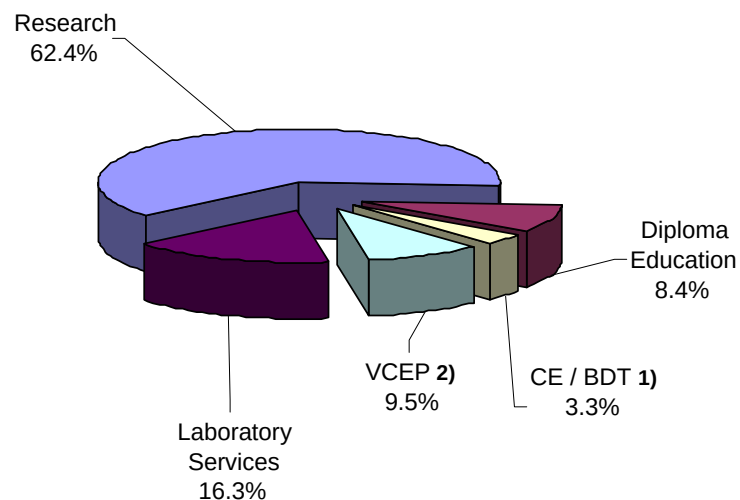
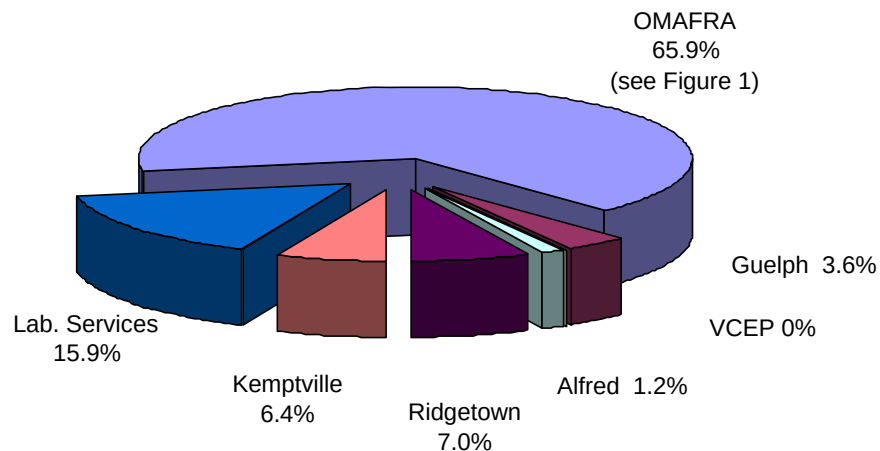


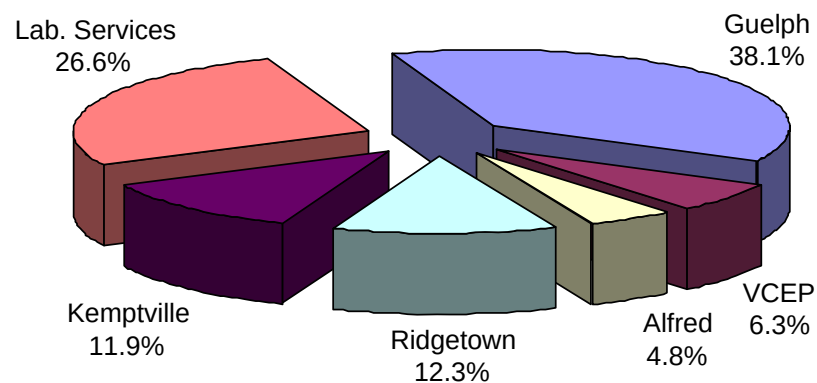
**Figure 3: OMAFRA Agreement Total Expenditures and Revenues - Fully Allocated**

| Location             | Fiscal 2005 / 2006 |      |                  |      |  | Fiscal 2004 / 2005 |      |                  |      |
|----------------------|--------------------|------|------------------|------|--|--------------------|------|------------------|------|
|                      | Expenditures       |      | Revenues         |      |  | Expenditures       |      | Revenues         |      |
|                      | \$<br>(millions)   | %    | \$<br>(millions) | %    |  | \$<br>(millions)   | %    | \$<br>(millions) | %    |
| OMAFRA Agreement     |                    |      | 50.0             | 65.9 |  |                    |      | 49.7             | 68.7 |
| Guelph <sup>1)</sup> | 28.9               | 38.1 | 2.7              | 3.6  |  | 27.9               | 38.6 | 2.9              | 4.0  |
| VCEP <sup>2)</sup>   | 4.8                | 6.3  | 0.0              | 0.0  |  | 4.8                | 6.6  | 0.0              | 0.0  |
| Alfred               | 3.7                | 4.8  | 0.9              | 1.2  |  | 3.6                | 5.0  | 1.3              | 1.8  |
| Ridgetown            | 9.3                | 12.3 | 5.3              | 7.0  |  | 8.8                | 12.2 | 4.9              | 6.8  |
| Kemptville           | 9.0                | 11.9 | 4.9              | 6.4  |  | 8.1                | 11.2 | 4.4              | 6.1  |
| Lab. Services        | 20.2               | 26.6 | 12.0             | 15.9 |  | 19.1               | 26.4 | 9.1              | 12.6 |
| Total:               | 75.8               | 100  | 75.8             | 100  |  | 72.4               | 100  | 72.4             | 100  |

**OMAFRA Contract: 2005/2006  
GROSS REVENUES**



**OMAFRA Contract: 2005/2006  
TOTAL PROGRAM EXPENDITURES**



<sup>(1)</sup> Includes expenditures for research stations, former HRIO locations (Vineland, Simcoe, Bradford) and all Guelph campus research and diploma education activities. HRIO operations were included with Guelph operations beginning May 2002.

<sup>(2)</sup> Veterinary Clinical Education Program

Note: These Figures exclude Minor Capital Repair Fund.

| <b>Table 5.1.2: 2005/2006 Fully Allocated <sup>1)</sup> Research Expenditures and Revenues by Program and Location (in thousands of dollars)</b> |                |                |                   |                |                  |                |                |                |                |                |
|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|-------------------|----------------|------------------|----------------|----------------|----------------|----------------|----------------|
| <b>Program Area</b>                                                                                                                              | <b>Alfred</b>  |                | <b>Kemptville</b> |                | <b>Ridgetown</b> |                | <b>Guelph</b>  |                | <b>TOTAL</b>   |                |
|                                                                                                                                                  | <b>'05/'06</b> | <b>'04/'05</b> | <b>'05/'06</b>    | <b>'04/'05</b> | <b>'05/'06</b>   | <b>'04/'05</b> | <b>'05/'06</b> | <b>'04/'05</b> | <b>'05/'06</b> | <b>'04/'05</b> |
| <b>Plants</b>                                                                                                                                    |                |                |                   |                |                  |                |                |                |                |                |
| Total Expenses                                                                                                                                   | -              | -              | 747               | 795            | 1,909            | 1,733          | 8,495          | 8,290          | 11,151         | 10,818         |
| Revenues                                                                                                                                         | -              | -              | (88)              | (54)           | (189)            | (69)           | (35)           | (26)           | (312)          | (150)          |
| <b>Net Expenses *</b>                                                                                                                            | -              | -              | 659               | 741            | 1,720            | 1,664          | 8,460          | 8,264          | 10,839         | 10,669         |
| <b>Animals</b>                                                                                                                                   |                |                |                   |                |                  |                |                |                |                |                |
| Total Expenses                                                                                                                                   | -              | -              | 1,516             | 1,373          | 123              | 175            | 14,242         | 14,474         | 15,881         | 16,022         |
| Revenues                                                                                                                                         | -              | -              | (317)             | (345)          | (12)             | (7)            | (2,407)        | (2,632)        | (2,736)        | (2,984)        |
| <b>Net Expenses *</b>                                                                                                                            | -              | -              | 1,198             | 1,028          | 111              | 168            | 11,835         | 11,842         | 13,145         | 13,038         |
| <b>Food</b>                                                                                                                                      |                |                |                   |                |                  |                |                |                |                |                |
| Total Expenses                                                                                                                                   | -              | -              | 61                | 59             | -                | -              | 1,884          | 1,735          | 1,945          | 1,794          |
| Revenues                                                                                                                                         | -              | -              | (1)               | (1)            | -                | -              | (1)            | (0)            | (2)            | (1)            |
| <b>Net Expenses *</b>                                                                                                                            | -              | -              | 60                | 58             | -                | -              | 1,883          | 1,735          | 1,943          | 1,793          |
| <b>Resources Management &amp; Environment</b>                                                                                                    |                |                |                   |                |                  |                |                |                |                |                |
| Total Expenses                                                                                                                                   | 125            | 183            | 297               | 261            | 1,029            | 833            | 3,255          | 2,777          | 4,705          | 4,054          |
| Revenues                                                                                                                                         | (0)            | (31)           | (7)               | (8)            | (102)            | (33)           | (10)           | (0)            | (199)          | (72)           |
| <b>Net Expenses *</b>                                                                                                                            | 125            | 152            | 290               | 253            | 926              | 800            | 3,246          | 2,777          | 4,586          | 3,982          |
| <b>Sustainable Rural Communities</b>                                                                                                             |                |                |                   |                |                  |                |                |                |                |                |
| Total Expenses                                                                                                                                   | -              | -              | -                 | -              | -                | 20             | 330            | 338            | 330            | 358            |
| Revenues                                                                                                                                         | -              | -              | -                 | -              | -                | (1)            | 20             | (0)            | 20             | (1)            |
| <b>Net Expenses *</b>                                                                                                                            | -              | -              | -                 | -              | -                | 19             | 350            | 338            | 350            | 357            |
| <b>Bioproducts <sup>3)</sup></b>                                                                                                                 |                |                |                   |                |                  |                |                |                |                |                |
| Total Expenses                                                                                                                                   | -              | -              | -                 | -              | -                | -              | 358            | -              | 358            | -              |
| Revenues                                                                                                                                         | -              | -              | -                 | -              | -                | -              | (0)            | -              | (0)            | -              |
| <b>Net Expenses *</b>                                                                                                                            | -              | -              | -                 | -              | -                | -              | 358            | -              | 358            | -              |
| <b>Total</b>                                                                                                                                     |                |                |                   |                |                  |                |                |                |                |                |
| Total Expenses <sup>4)</sup>                                                                                                                     | 125            | 183            | 2,620             | 2,488          | 3,061            | 2,761          | 28,564         | 27,614         | 34,371         | 33,046         |
| Revenues                                                                                                                                         | (0)            | (31)           | (413)             | (407)          | (304)            | (110)          | (2,433)        | (2,659)        | (3,150)        | (3,207)        |
| <b>Net Expenses *</b>                                                                                                                            | 125            | 152            | 2,208             | 2,081          | 2,757            | 2,651          | 26,131         | 24,955         | 31,221         | 29,839         |

\* Net Expenses represents the OMAFRA transfer payment contribution to that program/location.

<sup>1)</sup> Program Service Costs and Institutional Infrastructure and Support costs have been allocated to each of the sub-programs to demonstrate the 'all-in' (i.e., Fully Allocated) costs for each sub-program/location.

<sup>2)</sup> \$3.4K of expenses for IP Review Costs related to proposals for the Sustainable Production Systems program were included within the Animal Program expenses reported here

<sup>3)</sup> The Bioproducts Research program was initiated in fiscal 2005/06

<sup>4)</sup> A portion of the Agreement Service Costs (\$5,837 in total for research in 05/06) were allocated to each location as part of the 'fully allocated costs' methodology.

| <b>Program Area</b>                                               | <b>Alfred</b>  |                | <b>Kemptville</b> |                | <b>Ridgetown</b> |                | <b>Guelph</b>  |                | <b>TOTAL</b>   |                |
|-------------------------------------------------------------------|----------------|----------------|-------------------|----------------|------------------|----------------|----------------|----------------|----------------|----------------|
|                                                                   | <b>'05/'06</b> | <b>'04/'05</b> | <b>'05/'06</b>    | <b>'04/'05</b> | <b>'05/'06</b>   | <b>'04/'05</b> | <b>'05/'06</b> | <b>'04/'05</b> | <b>'05/'06</b> | <b>'04/'05</b> |
| <b>DIPLOMA EDUCATION PROGRAMS</b>                                 |                |                |                   |                |                  |                |                |                |                |                |
| <b>Agriculture</b>                                                |                |                |                   |                |                  |                |                |                |                |                |
| Total Expenses                                                    | 1,163          | 1,282          | 2,225             | 1,889          | 1,175            | 1,242          | -              | 1              | 4,563          | 4,414          |
| Revenues                                                          | (133)          | (172)          | (1,614)           | (1,486)        | (1,033)          | (1,036)        | -              | (1)            | (2,780)        | (2,694)        |
| <b>Net Expenses *</b>                                             | <b>1,030</b>   | <b>1,110</b>   | <b>611</b>        | <b>404</b>     | <b>143</b>       | <b>206</b>     | <b>-</b>       | <b>0</b>       | <b>1,784</b>   | <b>1,720</b>   |
| <b>Horticulture</b>                                               |                |                |                   |                |                  |                |                |                |                |                |
| Total Expenses                                                    | -              | -              | 228               | 163            | 701              | 708            | -              | -              | 929            | 871            |
| Revenues                                                          | -              | -              | (108)             | (53)           | (338)            | (288)          | -              | -              | (446)          | (341)          |
| <b>Net Expenses *</b>                                             | <b>-</b>       | <b>-</b>       | <b>120</b>        | <b>110</b>     | <b>362</b>       | <b>421</b>     | <b>-</b>       | <b>-</b>       | <b>483</b>     | <b>530</b>     |
| <b>Food &amp; Nutrition</b>                                       |                |                |                   |                |                  |                |                |                |                |                |
| Total Expenses                                                    | 383            | 358            | 813               | 820            | -                | -              | -              | -              | 1,195          | 1,178          |
| Revenues                                                          | (47)           | (48)           | (387)             | (448)          | -                | -              | -              | -              | (434)          | (496)          |
| <b>Net Expenses *</b>                                             | <b>335</b>     | <b>310</b>     | <b>425</b>        | <b>372</b>     | <b>-</b>         | <b>-</b>       | <b>-</b>       | <b>-</b>       | <b>761</b>     | <b>682</b>     |
| <b>Veterinary Technician</b>                                      |                |                |                   |                |                  |                |                |                |                |                |
| Total Expenses                                                    | 713            | 626            | -                 | -              | 1,384            | 1,450          | -              | -              | 2,097          | 2,076          |
| Revenues                                                          | (276)          | (261)          | -                 | -              | (875)            | (943)          | -              | -              | (1,151)        | (1,205)        |
| <b>Net Expenses *</b>                                             | <b>436</b>     | <b>365</b>     | <b>-</b>          | <b>-</b>       | <b>509</b>       | <b>506</b>     | <b>-</b>       | <b>-</b>       | <b>946</b>     | <b>871</b>     |
| <b>Environmental Management</b>                                   |                |                |                   |                |                  |                |                |                |                |                |
| Total Expenses                                                    | -              | -              | -                 | -              | 492              | 556            | -              | -              | 492            | 556            |
| Revenues                                                          | -              | -              | -                 | -              | (338)            | (320)          | -              | -              | (338)          | (320)          |
| <b>Net Expenses *</b>                                             | <b>-</b>       | <b>-</b>       | <b>-</b>          | <b>-</b>       | <b>154</b>       | <b>237</b>     | <b>-</b>       | <b>-</b>       | <b>154</b>     | <b>237</b>     |
| <b>Turf Management</b>                                            |                |                |                   |                |                  |                |                |                |                |                |
| Total Expenses                                                    | -              | -              | -                 | -              | -                | -              | 354            | 298            | 354            | 298            |
| Revenues                                                          | -              | -              | -                 | -              | -                | -              | (261)          | (265)          | (261)          | (265)          |
| <b>Net Expenses *</b>                                             | <b>-</b>       | <b>-</b>       | <b>-</b>          | <b>-</b>       | <b>-</b>         | <b>-</b>       | <b>93</b>      | <b>33</b>      | <b>93</b>      | <b>33</b>      |
| <b>Total - DIPLOMA EDUCATION PROGRAMS</b>                         |                |                |                   |                |                  |                |                |                |                |                |
| Total Expenses                                                    | 2,258          | 2,266          | 3,266             | 2,872          | 3,753            | 3,956          | 354            | 299            | 9,631          | 9,393          |
| Revenues                                                          | (457)          | (481)          | (2,109)           | (1,987)        | (2,584)          | (2,586)        | (261)          | (267)          | (5,411)        | (5,321)        |
| <b>Net Expenses *</b>                                             | <b>1,801</b>   | <b>1,785</b>   | <b>1,157</b>      | <b>885</b>     | <b>1,168</b>     | <b>1,370</b>   | <b>93</b>      | <b>33</b>      | <b>4,220</b>   | <b>4,072</b>   |
| <b>CONTINUING EDUCATION / BUSINESS DEVELOPMENT &amp; TRAINING</b> |                |                |                   |                |                  |                |                |                |                |                |
| Total Expenses                                                    | 1,291          | 1,138          | 3,129             | 2,763          | 2,498            | 2,127          | -              | -              | 6,918          | 6,028          |
| Revenues                                                          | (480)          | (762)          | (2,345)           | (2,019)        | (2,440)          | (2,226)        | -              | -              | (5,265)        | (5,007)        |
| <b>Net Expenses *</b>                                             | <b>811</b>     | <b>376</b>     | <b>784</b>        | <b>744</b>     | <b>58</b>        | <b>(99)</b>    | <b>-</b>       | <b>-</b>       | <b>1,653</b>   | <b>1,021</b>   |
| <b>Total - All Education Programs</b>                             |                |                |                   |                |                  |                |                |                |                |                |
| Total Expenses <sup>2)</sup>                                      | 3,549          | 3,404          | 6,395             | 5,635          | 6,251            | 6,083          | 354            | 299            | 16,549         | 15,421         |
| Revenues                                                          | (937)          | (1,244)        | (4,454)           | (4,006)        | (5,024)          | (4,812)        | (261)          | (267)          | (10,676)       | (10,328)       |
| <b>Net Expenses *</b>                                             | <b>2,612</b>   | <b>2,161</b>   | <b>1,941</b>      | <b>1,629</b>   | <b>1,227</b>     | <b>1,270</b>   | <b>93</b>      | <b>33</b>      | <b>5,873</b>   | <b>5,093</b>   |

\* Net Expenses represents the OMAFRA transfer payment contribution to that program/location.

<sup>1)</sup> Program Service Costs and Institutional Infrastructure and Support costs have been allocated to each of the sub-programs to demonstrate the 'all-in' (i.e., Fully Allocated) costs for each program/location.

<sup>2)</sup> A portion of the Agreement Service Costs (\$238K in total for Education Programs in 05/06) were allocated to each location as part of the 'fully allocated costs' methodology.

**Table 5.1.4: 2005/2006 Fully Allocated <sup>1)</sup> Laboratory Services Division Expenditures by Program (in thousands of dollars)**

| Program Area                                                   | Guelph         |                |
|----------------------------------------------------------------|----------------|----------------|
|                                                                | '05/'06        | '04/'05        |
| <b>Animal Health Laboratory</b>                                |                |                |
| Total Expenses                                                 | 8,518          | 7,542          |
| Revenues                                                       | (2,952)        | (2,486)        |
| <b>Net Expenses *</b>                                          | 5,565          | 5,056          |
| <b>Food Safety &amp; Scheduled Product/Plant/Soil Analyses</b> |                |                |
| Total Expenses                                                 | 11,652         | 11,586         |
| Revenues                                                       | (9,071)        | (6,633)        |
| <b>Net Expenses *</b>                                          | 2,581          | 4,953          |
| <b>Total</b>                                                   |                |                |
| Total Expenses                                                 | 20,169         | 19,128         |
| Revenues                                                       | (12,023)       | (9,120)        |
| <b>Net Expenses *</b>                                          | 8,146          | 10,008         |
| Direct Program Expenses (Sch. K base)                          | 9,000          | 9,000          |
| Carry-forward from prev. year                                  | <u>1,705</u>   | <u>2,441</u>   |
| <b>Sub-total:</b>                                              | <b>10,705</b>  | <b>11,441</b>  |
| Allocated Service Costs                                        | 272            | 272            |
| less Year end balance                                          | <u>(2,831)</u> | <u>(1,705)</u> |
| <b>Fully Allocated Net Expenses</b>                            | <b>8,146</b>   | <b>10,008</b>  |

Notes:

\* Net Expenses represents the OMAFRA transfer payment contribution to that program/location for the fiscal year.

<sup>1)</sup> Program Service Costs and Institutional Infrastructure and Support costs have been allocated to each of the sub-programs to demonstrate the 'all-in' (i.e., Fully Allocated) costs for each sub-program/location

<sup>2)</sup> A total of \$272K of the portion of the Agreement Service Costs was allocated to LS as part of the 'fully allocated costs' methodology. This allocation is the difference between the Fully Allocated net expenses by location as reported in Table 5.1.4 and the net direct expenses by LS.

**Table 5.1.5: 2005/2006 Fully Allocated <sup>1)</sup> VCEP – Veterinary Clinical Education Program Expenditures (in thousands of dollars)**

| Program Area                 | Guelph       |              |
|------------------------------|--------------|--------------|
|                              | '05/'06      | '04/'05      |
| <b>Total</b>                 |              |              |
| Total Expenses <sup>2)</sup> | 4,755        | 4,788        |
| Revenues                     | -            | (4)          |
| <b>Net Expenses *</b>        | <b>4,755</b> | <b>4,792</b> |

Notes:

\* Net Expenses represents the OMAFRA transfer payment contribution to that program/location.

<sup>1)</sup> Program Service Costs and Institutional Infrastructure and Support costs have been allocated to each of the sub-programs to demonstrate the 'all-in' (i.e., Fully Allocated) costs for each sub-program/location.

<sup>2)</sup> A total of \$63K of the portion of the Agreement Service Costs was allocated to VCEP as part of the 'fully allocated costs' methodology. This allocation is the difference between the Fully Allocated net expenses as reported in Table 5.15 and the net direct expenses for VCEP.

## 2005/2006 OMAFRA Minor Capital Program

For a second year, OMAFRA announced that over one million dollars had been approved for ‘minor capital’ program funding in the areas of animal care and deferred maintenance at the research stations and regional campuses. These funds were, as in the previous year, targeted specifically to address the most critical facility deficiencies pertaining to animal care, health and safety, and code compliance, along with some crucial purchases of equipment. The same stipulations remained as in the previous year where a project was related to an urgent animal care issue that has been deferred by ORC due to funding limits, projects that fit within ORC’s responsibility or eligibility for funding from the ORC base building capital pool were deferred to ORC / ProFac by OMAFRA.

Again; using the ‘facility deficiency lists’ submitted by the U of G to OMAFRA as of June 2005, but this year in order to get a head start of the tendering process this list was submitted to OMAFRA in April/May 2005. This strategic listing of ‘animal care and deferred maintenance’ priority projects was developed with input from Ministry and U of G station/campus representatives and subsequently approved by senior OMAFRA and U of G management. In addition, a short-list of smaller, ‘quick-turn around’ projects was established that could be funded if there was unspent money near year-end.

After approval-in-principle for the project listing, local U of G Managers obtained the requisite quotes/tenders as applicable according to the U of G and Ministry purchasing guidelines. In accordance with agreed on procedure, the projects were managed administratively by the University using purpose-designated project accounts, and once the project was completed the University invoiced the Ministry for reimbursement of the costs.

The following table summarizes the number and \$ value of the minor capital projects funded in 2005/06 by location.

**Table 5.2.1: Total Minor Capital Projects by Location**

| Station                                  | # of Projects | Total Cost *   |
|------------------------------------------|---------------|----------------|
| Alfred Campus                            | 3             | 45,408         |
| Alma Research Station                    | 4             | 28,903         |
| Arkell Equine Research Station           | 0             | 0              |
| Arkell Feedmill                          | 2             | 12,084         |
| Arkell Poultry Research Station          | 6             | 47,078         |
| Arkell/Elora Research Station Operations | 11            | 202,886        |
| Arkell Swine Research Station            | 10            | 217,981        |
| Elora Beef Research Station              | 4             | 34,623         |
| Elora Crop Science Research Station      | 2             | 14,807         |
| Elora/Ponsonby Dairy Research Station    | 5             | 19,043         |
| Kemptville Campus                        | 2             | 55,122         |
| Muck Research Station                    | 2             | 28,907         |
| New Liskeard Research Station            | 1             | 34,878         |
| Ponsonby General Research Station        | 2             | 3,991          |
| Ponsonby Sheep Research Station          | 0             | 0              |
| Ridgetown Campus                         | 3             | 136,914        |
| Simcoe Research Station                  | 2             | 1,793          |
| Turfgrass Research Institute             | 2             | 15,625         |
| Office of Research Guelph                | 0             | 0              |
| Vineland Research Station                | 3             | 42,981         |
| Winchester Research Station              | 0             | 0              |
| Woodstock Research Station               | 6             | 17,474         |
| <b>Total</b>                             | <b>70</b>     | <b>960,500</b> |

*\* includes a few approved projects at the stations that were managed directly between OMAFRA and ORC*

In addition to the above, other monies were allocated but managed directly between OMAFRA and ORC for several decommissioning projects, as outlined in the table below:

**Table 5.2.2 Decommissioning Projects**

| <b>Decommissioning Projects</b>                    |          |                  |
|----------------------------------------------------|----------|------------------|
| Arkell/Elora Research Station Operations           | 2        | 10,174           |
| Kemptville Campus                                  | 1        | 2,716            |
| Alfred Campus                                      | 1        | 21,830           |
| Ponsonby                                           | 1        | 5,062            |
| <b>Total</b>                                       | <b>5</b> | <b>39,782</b>    |
| <b>OMAFRA Minor Capital Projects for 2005/2006</b> |          | <b>1,000,282</b> |

## 6. Media Coverage

Between May 2005 and April 2006, the combined efforts of students in Owen Roberts's agricultural communication classes and in Students Promoting Awareness of Research Knowledge (SPARK), both based at the University of Guelph, have produced the following list of published and broadcast news stories on a variety of OMAFRA-sponsored projects. These stories have appeared in a number of different periodicals and publications, and cover the spectrum of the University's many different research institutions and sites, including the regional campuses – Kemptville, Ridgetown and Alfred – and the research stations in Elora, Vineland and Arkell, as well as the six colleges on U of G's main campus. The primary vehicles for publication are the Ontario farm media, the University of Guelph main website and research website, and the *Guelph Mercury* through the weekly column *SPARKPlugs*. Through an agreement with OMAFRA's Town & Country Ontario television, students contribute InfoBreaks to that program, as well. Research news articles can be accessed from [www.uoguelph.ca/research/news/index.shtml](http://www.uoguelph.ca/research/news/index.shtml) and general information on the University's research communications can be found at [www.uoguelph.ca/research/communications/index.shtml](http://www.uoguelph.ca/research/communications/index.shtml).

### ***Research Magazine Summer 2005***

"The wages of fear, terrorists attacks on food supply would cripple economy, say researchers" *Research* – Summer 2005 (Karl Meilke, Department of Agricultural Economics and Business)

### ***Pig Pens Summer 2005 newsletter***

"Stirring up a new swine feed recipe," *Pig Pens* - Summer 2005 (Phil McEwen, Ridgetown campus)

"Sows sacrifice, producers pay," *Pig Pens*- Summer 2005 (Trevor Smith, Department of Animal and Poultry Science)

### ***Pig Pens Spring 2006 newsletter***

"Keeping Fertilizers Friendly," *Pig Pens*- Spring 2006 (Claudia Wagner-Riddle and Susantha Jayasundara, Department of Land Resource Science)

### ***Focus on Kemptville College newsletter***

"Why waste good nutrients?," *Focus on Kemptville College*– September 2005 (Bill Curnoe, Kemptville Campus)

### ***Guelph Mercury newspaper***

"Newly engineered barley to the rescue," *Guelph Mercury* – Sept 2, 2005 (Duane Falk, Department of Plant Agriculture)

"Researchers looking into peach trees that reach for the sky," *Guelph Mercury* – Aug 12, 2005 (John Cline and Debbie Norton, Department of Plant Agriculture)

"What consumers don't know can hurt sales," *Guelph Mercury* – July 22, 2005 (Spencer Hanson, Department of Agricultural Economics)

“Putting agricultural conservation on the map,” *Guelph Mercury* – July 15, 2005 (Wanhong Yang, Department of Geography)

“Researchers draw the line between good and bad fats,” *Guelph Mercury* – July 8, 2005 (Lindsay Robinson, Department of Human Biology and Nutritional Sciences)

“This new soybean line tastes just fine, testers say,” *Guelph Mercury* – June 24, 2005 (Peter Pauls, Department of Plant Agriculture)

### ***At Guelph newspaper***

“Peach trees that reach for the sky,” *At Guelph* – September, 2005 (John Cline and Debbie Norton, Department of Plant Agriculture)

“Friendly fat,” *At Guelph* – June 1, 2005 (Lindsay Robinson, Department of Human Biology and Nutritional Sciences)

### ***Pork News (e-newsletter, Ontario Pork)***

“Take measures to reduce animal stress,” *Pork News* – April, 2006 (Cate Dewey, Department of Population Medicine)

“Keeping fertilizers friendly,” *Pork News* – March, 2006 (Claudia Wagner-Riddle and Susantha Jayasundara, Department of Land Resource Science)

“Easing problems caused by urease,” *Pork News* – January, 2006 (Carlton Gyles, Department of Pathobiology)

“Got sow milk?” *Pork News* – December, 2005 (Paul Luimes, Ridgetown campus)

“Finding the enemy of the enemy,” *Pork News* – September, 2005 (Nidham Jamalludeen, Department of Pathobiology)

“E-coli- the good, the bad, the resistant,” *Pork News* – July, 2005 (Patrick Boerlin, Department of Pathobiology)

### ***The Milk Producer magazine***

“A smooth transition,” *The Milk Producer* – April 2006 (Todd Duffield, Department of Population Medicine)

“Watching their step,” *The Milk Producer* – March 2006 (Kerry Lissemore, David Kelton and Gerard Cramer, Department of Population Medicine)

“To cull or not to cull,” *The Milk Producer* – February 2006 (Jim Fisher, Kemptville Campus)

“Kyoto-pleasing feed,” *The Milk Producer* – January 2006 (Brian McBride and Nicholas Odongo, Department of Animal and Poultry Science)

“3,400 new jobs in five years?,” *The Milk Producer* – December 2005 (John Cranfield, Department of Agricultural Economics and Business)

“Energizing heifer diets,” *The Milk Producer* – November 2005 (Paul Sharpe, Kemptville Campus)

“Feeding for better breeding,” *The Milk Producer* – October 2005 (Paul Sharpe, Kemptville Campus)

“Diet Delight,” *The Milk Producer* – July 2005 (Harvey Anderson and France Cho, Department of Nutritional Sciences, University of Toronto)

“Three-pronged approach,” *The Milk Producer* – June 2005 (Ken Leslie and Cindy Todd, Department of Population Medicine and Dennis McKnight, Kemptville Campus)

### ***Ontario Dairy Farmer magazine***

“Show me the money,” *Ontario Dairy Farmer* – April 2006 (Bill Bettger, Department of Human Biology and Nutritional Services, and Brian McBride, Department of Animal and Poultry Science)

“A new breed of healthier cows,” *Ontario Dairy Farmer* – March 2006 (Bonnie Mallard, Department of Pathobiology)

“Humans versus machines,” *Ontario Dairy Farmer* – October 2005 (Dennis McKnight, Department of Animal Science, Kemptville campus)

“Dairy cow bacteria put up little resistance,” *Ontario Dairy Farmer* – July/August 2005 (David Leger, Department of Population Medicine)

“Picking winners in the waiting game,” *Ontario Dairy Farmer* – May/June 2005 (Stephan LeBlanc, Department of Population Medicine)

### ***Ontario Beef Farmer magazine***

“Fighting virus with virus,” *Ontario Beef Farmer* – Early Fall 2005 (Dongwan Yoo, Department of Pathobiology)

### ***Ontario Hog Farmer magazine***

“Easing problems caused by urease,” *Ontario Hog Farmer* – March/April 2006 (Carlton Gyles, Department of Pathobiology)

“Sows sacrifice, producers pay,” *Ontario Hog Farmer* – Jan/Feb 2006 (Trevor Smith, Department of Animal and Poultry Science)

“Stirring up a new swine feed recipe,” *Ontario Hog Farmer* – Oct/ Nov 2005 (Phil McEwen, Ridgetown campus)

“DNA hitches a ride,” *Ontario Hog Farmer* – September 2005 (Serguei Golovan, Department of Animal and Poultry Science)

“Shocking Odours,” *Ontario Hog Farmer* – June 2005 (Nigel Bunce and Dorin Bejan, Department of Chemistry)

“Stopping salmonella at the source,” *Ontario Hog Farmer* – May 2005 (Jeffrey Gray, Department of Pathobiology)

### ***Ontario Poultry Farmer magazine***

“Disease free chickens- in one shot,” *Ontario Poultry Farmer* – Spring 2006 (Eva Nagy, Department of Pathobiology)

“A new approach to poultry disease,” *Ontario Poultry Farmer* – Fall 2005 (Shayan Sharif, Department of Pathobiology)

### ***Research Roundup- Ontario Cattleman’s Association magazine***

“More cash from cull cows,” *Research Roundup* – October 2005 (Ira Mandell, Department of Animal and Poultry Science)

“Efficient feeding for farms,” *Research Roundup* – August 2005 (Kendall Swanson, Department of Animal and Poultry Science)

“Improving pregnancy rates with AI,” *Research Roundup* – May 2005 (Walter Johnson, Department of Population Medicine)

“Researchers take bacterial count on Ontario Beef Farms,” *Research Roundup* – May 2005 (Scott McEwen and Shiva Ghimire, Department of Population Medicine)

### ***Greenhouse Canada magazine***

“New program prompts technical innovation,” *Greenhouse Canada* – 2005 (Jamie Doran, Department of Plant Agriculture)

### ***The Grower newspaper***

“A new king among beans,” *The Grower* – 2005 (Peter Pauls, Department of Plant Agriculture)

“Barley to the rescue,” *The Grower* – 2005 (Duane Falk, Department of Plant Agriculture)

“Choosing the right seeds,” *The Grower* – 2005 (Bill Curnoe, Kemptville campus)

### ***Town and Country Ontario Television InfoBreaks***

“New nutrition labels,” *Town and Country Ontario, InfoBreak* – Winter, 2006 (Sarah Wilson, Food Safety Network)

“Professional Agrologists,” *Town and Country Ontario, InfoBreak* – Winter, 2006 (Don Good, Ontario Institute of Agrologists)

“Soil under scrutiny,” *Town and Country Ontario, InfoBreak* – Winter, 2006 (Richard Heck, Department of Land Resource Science)

“Animal care assessment tool,” *Town and Country Ontario, InfoBreak* – Winter, 2006 (Ontario Pork Council, Steve Illick, Ontario Pork Producer)

“Virtual farm tours,” *Town and Country Ontario, InfoBreak* – Winter, 2006 (Kelly Daynard, Ontario Farm Animal Council)

“Public perception of farming,” *Town and Country Ontario, InfoBreak* – Winter, 2006 (Crystal Mackay, Ontario Farm Animal Council)

“Farm to fork food safety,” *Town and Country Ontario, InfoBreak* – Winter, 2006 (Bob Hunsberger, Ontario Pork Producer, Arnold Drung, Conestoga Meat Packers)

“Farmers Feed Cities,” *Town and Country Ontario, InfoBreak* – Winter, 2006 (Peter Tuinema, Ontario Grain and Oilseed Safety Net Committee)

“Becoming organically certified,” *Town and Country Ontario, InfoBreak* – Winter, 2006 (Duane Falk, Department of Plant Agriculture)

“Healthy hearts, healthy minds,” *Town and Country Ontario, InfoBreak* – Winter, 2006 (Kristen Callow, Ontario Greenhouse Vegetable Growers)

“Buy local, buy fresh,” *Town and Country Ontario, InfoBreak* – Fall, 2005 (Peter Katona, Foodlink, Waterloo Region)

“Omega-3 for good health,” *Town and Country Ontario, InfoBreak* – Fall, 2005 (Bruce Holub, Department of Human Health and Nutritional Sciences)

“Questioning your water,” *Town and Country Ontario, InfoBreak* – Fall, 2005 (Andria Jones, University of Guelph)

“Removing the soy beany taste,” *Town and Country Ontario, InfoBreak* – Fall, 2005 (Peter Pauls, Department of Plant Agriculture)

“Climate change,” *Town and Country Ontario, InfoBreak* – Fall, 2005 (Barry Smit, Department of Geography)

“Media impact on food consumption,” *Town and Country Ontario, InfoBreak* – Fall, 2005 (Ben Chapman, Food Safety Network)

“Palm oil reduces cow methane,” *Town and Country Ontario, InfoBreak* – Fall, 2005 (Brian McBride, Department of Animal and Poultry Science)

“The Ontario AgriCentre,” *Town and Country Ontario, InfoBreak* – Fall, 2005 (Peter Hannam, The Ontario AgriCentre)

“Avian flu,” *Town and Country Ontario, InfoBreak* – Fall, 2005 (Eva Nagy, Department of Pathobiology)

“Kitchen in transition,” *Town and Country Ontario, InfoBreak* – Fall, 2005 (Anita Stewart, culinary author)

“Farm animal care helpline,” *Town and Country Ontario, InfoBreak* – Fall, 2005 (Crystal Mackay, Ontario Farm Animal Council, Ron Douglas, Ontario Pork)

**April 2006**

**7. University of Guelph/ OMAFRA Equipment Inventory & Library Resources**

| <b><u>Summary of U of G / OMAFRA Equipment Inventories</u></b> |                                                |                                              |                                              |                                                  |
|----------------------------------------------------------------|------------------------------------------------|----------------------------------------------|----------------------------------------------|--------------------------------------------------|
| For Fiscal 2005/2006                                           |                                                |                                              |                                              |                                                  |
| <b><u>Location Name</u></b>                                    | <b><u>Opening Balance</u></b><br>(May 1, 2005) | <b><u>Acquisitions</u></b><br>(during 05/06) | <b><u>Dispositions</u></b><br>(during 05/06) | <b><u>Ending Balance</u></b><br>(April 30, 2006) |
| <b><u>Summary (totals of detailed data, below)</u></b>         |                                                |                                              |                                              |                                                  |
| <b>All OMAFRA Program locations</b>                            | <b>48,969,293*</b>                             | <b>1,815,691</b>                             | <b>1,841,535</b>                             | <b>48,943,449</b>                                |
| <b><u>Individual Location Details</u></b>                      |                                                |                                              |                                              |                                                  |
| Alfred Campus                                                  | 1,809,641                                      | 83,177                                       | 131,478                                      | 1,761,340                                        |
| Alma Aquaculture                                               | 891,074                                        | 9,513                                        | 5,550                                        | 895,037                                          |
| Arkell Equine                                                  | 34,000                                         | -                                            | 3,000                                        | 31,000                                           |
| Arkell Feedmill                                                | 832,000                                        | 1,200                                        | -                                            | 833,200                                          |
| Arkell Poultry                                                 | 823,200                                        | 22,200                                       | 2,500                                        | 842,900                                          |
| Arkell Swine                                                   | 511,000                                        | 1,200                                        | -                                            | 512,200                                          |
| Elora Beef                                                     | 1,506,824                                      | 199,700                                      | 107,650                                      | 1,598,874                                        |
| Elora Dairy                                                    | 835,300                                        | 69,000                                       | 3,000                                        | 901,300                                          |
| Elora Plant Agriculture                                        | 2,803,775                                      | 8,000                                        | 108,750                                      | 2,703,025                                        |
| Emo                                                            | 80,500                                         | -                                            | -                                            | 80,500                                           |
| Guelph Research Station Operations                             | 2,936,847                                      | 62,250                                       | -                                            | 2,999,097                                        |
| Guelph Turfgrass                                               | 31,550                                         | 45,405                                       | 1,000                                        | 75,955                                           |
| Isolation Unit                                                 | 11,000                                         | 1,600                                        | -                                            | 12,600                                           |
| Kemptville Campus                                              | 1,665,642                                      | 153,024                                      | 196,900                                      | 1,621,766                                        |
| Bradford Muck Station                                          | 241,889                                        | 1,300                                        | -                                            | 243,189                                          |
| NLARS                                                          | 925,894                                        | 7,840                                        | 5,900                                        | 927,834                                          |
| Ponsonby Dairy                                                 | 368,000                                        | 25,930                                       | 2,500                                        | 391,430                                          |
| PGAF                                                           | 282,694                                        | 6,700                                        | 142,030                                      | 147,364                                          |
| Ponsonby Sheep                                                 | 102,020                                        | 8,900                                        | 1,200                                        | 109,720                                          |
| Ridgetown Campus *                                             | 5,030,392                                      | 362,283                                      | 55,887                                       | 5,336,788                                        |
| Simcoe                                                         | 631,400                                        | 43,500                                       | 74,000                                       | 600,900                                          |
| Thunder Bay                                                    | 78,500                                         | -                                            | -                                            | 78,500                                           |
| Woodstock                                                      | 456,865                                        | -                                            | 7,500                                        | 449,365                                          |
| Vineland                                                       | 2,868,621                                      | 13,747                                       | 43,000                                       | 2,839,368                                        |
| Lab Services                                                   | 23,210,665                                     | 689,222                                      | 949,690                                      | 22,950,197                                       |

| <u>Library Resources</u> |                                        |
|--------------------------|----------------------------------------|
| <u>Location</u>          | <u>Replacement<br/>Value \$ ('000)</u> |
| Alfred                   | 776                                    |
| Kemptville               | 1,163                                  |
| Ridgetown                | 1,232                                  |

\*Adjustment to Ridgetown Campus' Opening Balance to reflect removing the value of books which were included in the equipment inventory for 2004/05 in the amount of \$593,198.

**April 2006**

**8. INVENTORY AND RENTS OF DWELLING HOUSES STATUS**

| <b>Kemptville Campus</b>        | <b># Units</b> |               |               |
|---------------------------------|----------------|---------------|---------------|
| Kemptville                      | 1              |               |               |
| New Liskeard                    | <u>3</u>       |               |               |
| Total                           | 4              |               |               |
| Revenue                         |                | 14,316        |               |
| Expenses                        |                | <u>4,329</u>  |               |
| <b>Account balance: Opening</b> |                |               | <b>49,274</b> |
| <b>Closing</b>                  |                |               | <b>59,261</b> |
| <b>Ridgetown Campus</b>         |                |               |               |
| Ridgetown                       | 2              |               |               |
| Cedar Springs                   | <u>1</u>       |               |               |
| Total                           | 3              |               |               |
| Revenue                         |                | 21,966        |               |
| Expenses                        |                | <u>24,617</u> |               |
| <b>Account balance: Opening</b> |                |               | <b>37,069</b> |
| <b>Closing</b>                  |                |               | <b>34,418</b> |
| <b>Guelph Stations</b>          |                |               |               |
| Ariss                           | 3              |               |               |
| Alma                            | 1              |               |               |
| Hall House                      | 1              |               |               |
| Ponsonby                        | 1              |               |               |
| Arkell                          | 3              |               |               |
| Simcoe                          | 1              |               |               |
| Vineland                        | <u>2</u>       |               |               |
| Total                           | 12             |               |               |
| Revenue                         |                | 63,539        |               |
| Expenses                        |                | <u>86,629</u> |               |
| <b>Account balance: Opening</b> |                |               | <b>31,200</b> |
| <b>Closing</b>                  |                |               | <b>8,110</b>  |

**April 30, 2006**

## 9. LIVESTOCK INVENTORIES

|                                  | OPENING<br>MAY 1,<br>2005 | SOLD   | DIED <sup>(1)</sup> | TRANSFERRED |        | BORN OR<br>ACQUIRED | CLOSING<br>APRIL 30,<br>2006 |
|----------------------------------|---------------------------|--------|---------------------|-------------|--------|---------------------|------------------------------|
|                                  |                           |        |                     | IN          | OUT    |                     |                              |
| <b>ALFRED</b>                    |                           |        |                     |             |        |                     |                              |
| DAIRY                            | 73                        | 42     | 9                   |             |        | 44                  | 66                           |
| <b>KEMPTVILLE</b>                |                           |        |                     |             |        |                     |                              |
| DAIRY                            | 68                        | 85     | 13                  |             |        | 99                  | 69                           |
| <b>NEW LISKEARD</b>              |                           |        |                     |             |        |                     |                              |
| BEEF                             | 343                       | 145    | 6                   |             |        | 158                 | 350                          |
| <b>RIDGETOWN</b>                 |                           |        |                     |             |        |                     |                              |
| DAIRY                            | 73                        | 37     | 5                   |             |        | 35                  | 66                           |
| BEEF                             | 26                        | 8      |                     |             |        | 9                   | 27                           |
| SWINE                            | 400                       | 805    | 86                  | 14          | 7      | 869                 | 385                          |
| <b>GUELPH</b>                    |                           |        |                     |             |        |                     |                              |
| ARKELL EQUINE                    | 65                        | 16     | 7                   | 179         | 188    | 32                  | 65                           |
| ARKELL POULTRY                   | 10,447 <sup>(3)</sup>     | 1,356  | 4,807               | 2           | 4,978  | 7,068               | 6,376                        |
| ARKELL SWINE                     | 1,939                     | 3,082  | 1,958               |             | 763    | 5,312               | 1,448                        |
| ALMA AQUA                        | 118,729                   | 53,760 | 66,958              | 5,809       | 19,601 | 89,417              | 73,636                       |
| ELORA DAIRY                      | 300                       | 91     | 29                  | 16          | 58     | 157                 | 295                          |
| ELORA BEEF                       | 465                       | 266    | 16                  | 2           |        | 336                 | 521                          |
| PONSONBY DAIRY                   | 103                       | 44     | 13                  | 20          | 30     | 56                  | 92                           |
| PONSONBY<br>(GAF) <sup>(2)</sup> | 52                        | 192    | 11                  | 189         | 55     | 129                 | 112                          |
| PONSONBY SHEEP                   | 472                       | 222    | 18                  |             | 139    | 224                 | 317                          |
| <b>CLINICAL STUDIES</b>          |                           |        |                     |             |        |                     |                              |
| DAIRY                            | 70 <sup>(4)</sup>         | 21     | 0                   | 30          | 0      | 0                   | 79                           |
| SWINE                            | 37                        | 16     | 0                   | 22          | 0      | 0                   | 43                           |
| SHEEP                            | 152                       | 93     | 0                   | 17          | 0      | 0                   | 76                           |

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

<sup>(2)</sup> General Animal Facility

<sup>(3)</sup> Adjustment to opening balance to reflect addition of 178 turkeys purchased in April/04 but not included in the 2003/04 Livestock Inventories totals

<sup>(4)</sup> Adjustment to opening balance – 98 cows were sold prior to April/04 but not reported in the 2004/05 Livestock Inventories totals

## 10. ACRONYMS

|        |                                                         |
|--------|---------------------------------------------------------|
| AAFC   | Agriculture and Agri-Food Canada                        |
| ACC    | Animal Care Committee                                   |
| AHL    | Animal Health Laboratory                                |
| ARIO   | Agricultural Research Institute of Ontario              |
| AVMA   | American Veterinary Medical Association                 |
| BDO    | Business Development Office                             |
| BDT    | Business Development and Training                       |
| CCAC   | Canadian Council of Animal Care                         |
| CE     | Continuing Education                                    |
| CEP    | Clinical Education Program                              |
| CFI    | Canadian Foundation for Innovation                      |
| CFIA   | Canadian Food Inspection Agency                         |
| CVMA   | Canadian Veterinary Medical Association                 |
| CVO    | College of Veterinarians of Ontario                     |
| DFO    | Dairy Farmers of Ontario                                |
| DVM    | Doctor of Veterinary Medicine                           |
| DVSc   | Doctor of Veterinary Science                            |
| EHS    | Environmental Health & Safety                           |
| ERP    | Emergency Response Plan                                 |
| FSED   | Food Safety and Environment Division                    |
| FTE    | Full Time Equivalent                                    |
| GLP    | Good Laboratory Practices                               |
| HRIO   | Horticultural Research Institute of Ontario             |
| HVAC   | Heating, Ventilation and Air Conditioning               |
| ICD    | Innovation and Competitiveness Division                 |
| IP     | Intellectual Property                                   |
| IPM    | Integrated Pest Management                              |
| ISO    | International Standards Organization                    |
| KC     | Kemptville Campus                                       |
| LAIF   | Life Sciences and Agri-Food Innovation Fund             |
| LOI    | Letter of Intent                                        |
| LS     | Laboratory Services Division                            |
| MOE    | Ministry of the Environment                             |
| MTCU   | Ministry Training, Colleges and Universities            |
| NLARS  | New Liskeard Agricultural Research Station              |
| OABA   | Ontario Agri Business Association                       |
| OAC    | Ontario Agricultural College                            |
| OASIS  | OMAFRA Agreement's Information System                   |
| OAVT   | Ontario Association of Veterinary Technicians           |
| OIT    | Ontario Innovation Trust                                |
| OMAFRA | Ontario Ministry of Agriculture, Food and Rural Affairs |
| OPEP   | Ontario Pesticide Education Program                     |
| ORC    | Ontario Realty Corporation                              |
| OVC    | Ontario Veterinary College                              |
| PCR    | Polymerase Chain Reaction                               |
| PBR    | Plant Breeders Rights                                   |
| PGAF   | Ponsonby General Animal Facility                        |
| PMA    | Performance Measures Agreement                          |

|        |                                                    |
|--------|----------------------------------------------------|
| RME    | Resource Management and Environment                |
| RSSA   | Research Station Services and Access               |
| SPARK  | Students Promoting Awareness of Research Knowledge |
| SP2    | Sustainable Production Systems Program             |
| SRC    | Sustainable Rural Communities                      |
| U of G | University of Guelph                               |
| VCEP   | Veterinary Clinical Education Program              |
| VTH    | Veterinary Teaching Hospital                       |