Feasibility Study for Establishing a Centre of Excellence in Dairy Goat Research

Public Report
January 29th, 2009
Executive Summary

The Greater Peterborough Innovation Cluster with the support of the Agricultural Adaptation Council, Agriculture and Agri-Food Canada, and the Ontario dairy goat producers called for the development of a proposal to provide options for the establishment including funding opportunities and the governance of a Centre of Excellence for dairy goats and other small ruminants with collaboration between Trent University and the University of Guelph.

The dairy goat sector in Ontario is a small but growing sector. There are an estimated 270 dairy herds in Ontario with farm gate sales of $25 million annually. Central Ontario accounts for approximately 25% of the milk produced.
The meat goat sector is similar to the sheep meat sector. The sector is largely driven by the ethnic demand with peaks occurring at specific religious holidays. Kid weight at market varies with the timing of the religious celebrations. At retail, goat producers compete for sales with imported meat from New Zealand and Australia.

Goat fibre producers in Ontario are few with only one Cashmere producer and small Angora goat herd in the province. Recent plant closing has created new challenges for processing the fibre.

The Ontario sheep industry is well-developed and addresses the demand for meat in Ontario. Ontario and Quebec account for 50% of the production. There are also 50 or so milking sheep producers in Ontario.

The sheep industry for meat purposes has well-developed genetics. These have been encouraged through the use of genetic improvement tools that have been available to the sector for the past 25 years. The wool industry is supported by a marketing cooperative where wool is graded and sold to the wool processing sector.

The collection of goat and sheep milk at farms is constrained by the geography and costs for transportation, resulting in many producers shipping milk once a week. In recent years the sector has benefited from the entry of new producers. The range of farm sizes varies considerably from small herds with less than 100 goats to herds of more than 1000 does. Profit margins in the sector are believed to vary by farm size and producers refer to herd sizes of 400 goats as the minimum needed for profitability. The increasing proportion of larger commercialized flocks will require additional access to research and to the latest technologies available and in use in competing jurisdictions.

The dairy goat processing industry is anchored by one large dairy accounting for 60% of the goat milk processed. A group of smaller dairy processors are also servicing the sector with some focusing on capturing sales in the specialty niche markets and for export. Opportunities exist to expand markets into bath and beauty products as well as a full complement of processed dairy products.

Market segments have not been defined, nor market size determined; producers have been able to market all of their production as there is a gap between supply and demand for goat milk and milk products. There is evidence however that some processors are reaching their capacity to process more milk.
Mapping the supply chain indicates that current relationships to consumers are mostly indirect through the food distributor and food service sector. Smaller producers benefit from direct contact with consumers at farmers’ markets. The following diagram illustrates the various relationships existing in the sector.

**Goat Milk and Milk Products** are in demand by all consumers due to their potential health benefits. Although there is worldwide documentation on potential health effects, the Ontario industry has not established standards for the production of goat milk with specific attributes. Goat industry leaders are cognizant of this and want to explore the health potential to enable further market penetration with their products.

The market potential for dairy goat products is well documented in an AAFC 2005 dairy goat industry profile. **Artisan production** has not only increased its supply to niche
markets but has also expanded into the larger urban centres. Several distributors now cater to these markets, enabling smaller processors’ access to this market.

Ontario’s large ethnic population is predisposed to consuming goat products. This market segment can be very price conscious. In addition to the ethnic population, there is an increased consumer awareness associating local foods with freshness, taste and quality. Ontarians are also interested in ecotourism and in county food trails which could facilitate the exposure of dairy goat products to consumers.

A key challenge for the dairy goat sector is to move into a sustainable production level based on sound breeding, genetics, animal health and production practices to support processors with quality products in the marketplace. While there is considerable production research in other countries, there has virtually been an absence of research in Ontario and Canada. Quebec is an exception with a small research facility. As a result, the industry is growing without the benefit of research support and many threats to the sector’s sustainability remain.

With respect to production genetics, producers have access to a world-class genetic improvement program through Can West DHI. Recent DNA mapping of goat breeds under the leadership of AAFC will form a much needed database for future studies. The use of nucleus herds and the use of DNA techniques will become an integral component in making genetic advances. The combination of the DNA facilities at Trent University and the Centre for Genetic Improvement of Livestock at the University of Guelph offers opportunities for future genetic discoveries in area of gene markers for disease resistance and productive traits.

With respect to animal health, established producers maintain good vaccination programs, but are forced to use veterinary products as extra label products. The sector could benefit from the development of Ontario-specific vaccines and parasite control products that would be more effective in protecting goat herds. Much needed work is required to approve small ruminant product labels for Canada.

Good health status is critical to move Ontario-based genetics worldwide. Diseases of concern that can limit milk production are numerous and include parasitic infections, mastitis, abortion, Q fever, Clostridium infections, CAE, and others. Given that only Penicillin and Tetracycline drugs are licensed for goats, treatment is difficult and many times the disease is fatal or debilitating. One industry professional estimates the cost of CAE to be in excess of 300 litres of milk per doe lactation.

**An Approach for Future Research**
There are several key challenges facing the dairy goat sector. The industry needs to address sustainability issues to ensure that new entrants and producers in expansion
mode can remain in business. The sector must also ensure that as the supply of goat milk grows, markets can continue absorbing its production by offering safe and quality products in the marketplace. Accordingly, the dairy goat sector must embrace research efforts on a number of fronts in order to increase profit margins and remain competitive even though it is financially limited in its ability to support research. Lessons learned from other sectors will show severe economic penalties for a sector that is ill prepared to deal with new production and marketing issues. Consequently, a research strategy is needed whereby priorities for the sector are identified and adhered to with an adequate level of funding.

A **market driven research strategy** would see early efforts focus on consumers by identifying and understanding market segments. The results of these studies would in turn determine the food attributes needed for these markets, including accessibility to new products. Equipped with this new knowledge, producers and processors can then determine the production systems and processing requirements needed to supply the markets. As a sector, critical factors for success can be identified which would drive the research priorities for the sector.

The following illustration identifies an approach over a 10 year timeframe presenting the timing of the research effort and the balancing of allocations among economic sustainability, food-related research and production needs.

### Research Priorities through Public Funding

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<th>Economics</th>
<th>Market Research: Size &amp; Segmentation</th>
<th>Production economics</th>
<th>Sustainability</th>
<th>Tracability</th>
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<th>Tracability &amp; Quality attributes</th>
<th>Disease prevention claims</th>
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<th>Production</th>
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<th>Animal health</th>
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![Research Priorities through Public Funding Diagram](image_url)
As many of the research needs are applicable to all small ruminants, the sector will need to develop alliances to optimize its ability to support research. Animal health and genetics research on goats for meat and milk can be optimized by including similar research needs for sheep.

In addition to a sector profile, a literature review, a media search for recent goat-related topics, a sector governance review, and a review of the Quebec dairy goat sector, provided the necessary background to complete a Strengths, Weaknesses, Opportunities and Threats analysis (SWOT). The SWOT analysis then supported the formulation of a common vision for the Centre.

A Vision for the Centre
To promote the growth and competitiveness of the dairy goat and small ruminant sectors by servicing consumer demands for consistent, quality products in the marketplace.

The Centre of Excellence will deliver on its mandate through technology transfer activities, demonstration of production practices and basic and applied research.

The Centre will be guided by an Advisory Committee.

A Market Responsive Strategy for the Centre of Excellence
The following diagram outlines a basic structure for a Centre of Excellence. The Centre would be guided by consumer segments in the market place along with producer and processor representation. Market signals and market intelligence would drive research decisions at the Centre to ensure the work of the Centre supports a number of research mandates for the Centre.
Governance Structure for the Centre of Excellence

Once the Centre is reporting to the University the governance model will be:

Governance Model – Ongoing
Implementation of a Centre of Excellence

There are several key drivers for the development and implementation of a Centre of Excellence for Dairy Goat Research. These are:

- a market-driven approach to meet a known market supply gap
- an advisory committee to develop operating principles to drive the collaboration effort across institutions optimizing the resources and providing the best in science available to the sector
- research priorities addressing the economic sustainability of the sector, food safety and food research, and production related work
- the desire of the goat and small ruminant sector to support a Centre of Excellence
- Synergies to be gained through collaboration amongst institutions
- Optimizing existing infrastructure and human expertise to get the best in science

Accordingly the development and implementation proposed captures these factors as illustrated on the following page.
Research and Educational Institutions

Trent University’s interest in agriculture arises from student demand for courses related to agriculture. The university offers excellent degree programs in ecology, wildlife, water, environment and forestry. Having the ability to provide an agricultural curriculum would complement an existing science program and optimize synergies across related biological sciences. Trent has a new DNA facility suitable for research and for forensic sciences that can be leveraged to support projects in agriculture. The Centre for Genetic Improvement of Livestock at Guelph regularly uses the Trent DNA facility for analytical purposes. Faculty at Trent also support local agricultural research needs.

University of Guelph
The University of Guelph is world-renowned for its work on agricultural and food sciences. It delivers its research and teaching mandate through Veterinary College (OVC) and the Agricultural College (OAC). It has three associated Colleges, Ridgetown, Kemptville and Alfred, and numerous research sites and facilities throughout Ontario. Its education and research mandate in agriculture and food is delivered partly in partnership with OMAFRA. This partnership also covers funding for technology transfer activities. Although the University does not have a goat herd, it has a facility that can be used to undertake short term animal health studies. Its education curriculum on animal production covers dairy goat production.

Through the College of Biological Sciences, Human Health & Biological Sciences, the University of Guelph offers a state-of-the-art facility for research in life sciences with possibilities of interdisciplinary networks with researchers in the agricultural sciences with research directed towards natural health products and value added novel foods which offer health promotion, performance enhancement as well as disease prevent and management. Human health research interest also focuses on various aspects of gene regulation with respect to metabolism, nutritional effects on gene expression and risk factors for specific diseases.

Colleges in the Central Ontario Region such as Fleming, St Lawrence and Loyalist College also have interest in agriculture and food. These colleges can complement the expertise needed to sustain a Centre of Excellence.
Virtual Tech Transfer
A number of North American Universities offer Centres of Excellence through virtual websites. Ideally, a website would provide information about the centre’s structure and governance, communication links for researchers and the sector. The site would also offer the opportunity to post educational opportunities, research reports and offer virtual tours of goat farms and processors. A website architecture suitable for a collaborative model between Trent University and the University of Guelph is included in the report.

Funding Opportunities

Centres of Excellence
The Ontario Centres of Excellence (OCE) Programs bridge the gap between academia and industry by bringing together universities, industry and government together to help turn science and technology into successful business endeavors. The focus of its programs is on enhancing the competitiveness of Ontario’s industry by tapping into the potential for colleges and universities to act as generators of innovation. There are a number of programs that offer support for both short term and long term projects. The
Interact Program is designed to quickly initiate collaborative research partnerships between industry and universities.

**Private Sources**
Under most publically funded programs, sector participation is required. Therefore, the goat industry will need to find a mechanism to raise money to fund specific research in the future. Publically funded research programs also allow for in kind investments. The farm gate sales in the goat sector are estimated at $25 million annually. Using a 1% re-investment level into research for their industry, the sector is capable of supporting a Centre of Excellence once the initial infrastructure is in place. In addition, the sector also has access to funds through the Ontario Stockyard Fund. Suppliers of genetic improvement services, feed companies, and pharmaceutical companies represent a source of funding that can be leveraged against public funding. Processors and the food service sectors will have interest in research dealing with market segmentation, food safety and food attributes.

**Estimated Budget**
A five year budget projection has been developed and summarized in the report. It establishes potential salary, operating expenses, capital and research dollars required to operationalize the centre. It also sets targets for both producer and service provider commitments to research. Costs for a potential animal facility are projected in year 5.

**Summary of Recommendations**
The outline for a Dairy Goat Research Centre of Excellence has been presented in a modular basis to assist the Steering Committee with implementation decisions.

The main recommendations are the following:

- Proceed with a Centre of Excellence by signing a collaborative agreement between Trent University and the University of Guelph and subsequently with other area colleges.

- Address producer funding and participation issues.

- Seek early public funding to stabilize the operations of the Centre for the first five years and to provide seed monies for early research projects.

- Hire an Executive Director to initiate the Centre’s activities through the Advisory, Research, Education and Outreach Committees.