~ *Growing Food and Economy* ~

Economic Impact Study of the Agriculture and Food-Related Sectors in Waterloo Region

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Executive Summary

The economy of Waterloo Region has undergone a number of significant changes over the past 20 years. While its traditional economic base of agri-food products/services, automotive, and metal manufacturing/products has continued to thrive, a number of new industries have emerged - biotechnology, high tech manufacturing and information/communication technology. This evolution has led to a shift in attention away from the role played by Waterloo Region's more traditional industries, particularly the agri-food industry, to the role played by its emerging industries.

The purpose of this report is to take a fresh look at the role played by the agri-food industry in the economy of Waterloo Region. In particular, it is intended to inform program and policy development work within the Region of Waterloo Public Health Department. The Department recognizes the important role played by the food system in the creation of healthy communities and is interested in better understanding the magnitude and relative importance of key sectors in the Waterloo food system. The report is also intended to help the broader community better understand the nature and economic significance, in terms of dollars and jobs, of the local agricultural economy and food system. Only by better understanding the important role played by food-related activities can the various participants in the agri-food economy work together to make decisions which are economically sound, environmentally sustainable and socially responsible.

The study process used a multi-stakeholder approach which actively encouraged the participation of representatives from the different sectors of the food system. A steering committee, made up of representatives from the Regional Municipality of Waterloo, Human Resources Development Canada (HRDC), the Waterloo Federation of Agriculture (WFA), the Ontario Ministry of Agriculture and Food (OMAF), the Waterloo Wellington Training and Adjustment Board (WWTAB), the Woolwich Community Health Centre and Canada's Technology Triangle (CTT), provided valuable input and guided the implementation of the study.

To gauge the relative importance of food and agriculture in Waterloo Region's economy, particular attention was paid to assembling sales, employment and when available, value added data, for the three sectors of interest – primary, secondary and tertiary. For the purposes of the report, the primary sector includes those involved in the operation of farms. The secondary sector includes those involved in the commercial preparation, processing, manufacturing, packaging, storing, wholesaling and distribution of food for human consumption. The tertiary sector includes those involved in the direct sale of food to the consumer.

Data from the Population and Agricultural Census as well as information collected through key informant interviews and surveys of businesses representing the three sectors was used to develop a profile of the food system as it currently operates in Waterloo Region. Within the primary sector, additional approaches were used to measure the impact of the sector on agri-related businesses. These are consistent with methods used in other agri-impact studies completed across Ontario since 1998 and offer an enhancement by expanding the components of the food economy and compiling value added-data where available.

Findings for each of the three sectors are presented in individual chapters of the report. The final chapter presents an integrated perspective of the Waterloo Food Economy by providing a detailed model of the system, an overview of the three sectors taken as a whole and a discussion of key cross-sectoral themes that have emerged and what might be done about some of them. A literature review is provided as an Appendix in the report.

Taken as a group, the primary, secondary and tertiary sectors support over 26,380 food related jobs (2001/2002) or approximately 11.3% of Waterloo Region's labour force. The significance of the food industry contribution to regional employment is further demonstrated when one considers that the primary sector alone employs 3,450 in comparison to computer and electronic manufacturing, which employs 4,120.

Gross sales estimates for the primary sector ($380M in 2000), manufacturers and processors ($1,191M in 1999), farmers' markets ($21M in 2003), food stores ($829M in 2001) and food services ($248M in 2001) total almost $2.7 billion. If the sales associated with Wholesalers, Distributors, Warehousing/Storage and Agents/Brokers were factored in this figure would be even larger.

The value added component is substantial. Value added is the difference between a good's final value and the value of the other items that went into producing it. Each step in the value added chain uses capital and labour to create employment. Consequently, the more 'value' that is added to a product before final sale or export, the more benefits provided to the local economy. While one of the best measures of economic contribution, value added figures were only available for the primary sector ($131M in 2000) and for the food-related manufacturing and processing sector ($554M in 1999).

The Waterloo Food Economy represents a complex system of interconnected loops with each sector being impacted by a host of inputs and outputs which in turn change the inputs and outputs of the other sectors in the system. The system is not a closed system and is impacted by changes occurring elsewhere in the province, country and the world. Evidence of this can be seen in the effects of a world wide embargo placed on Canadian beef as the result of a single case of bovine spongiform encephalopathy (BSE or mad cow disease) in Alberta. Although regional figures are unavailable, Ontario's 21,000 beef producers were estimated to be losing about $4 million per week during the BSE situation (Ontario Cattlemen's Association, September 2, 2003).

In general, the food economy - farming, food manufacturing and food retailing - plays a more important role in Waterloo Region than in the average region in Ontario. The following are some of the more unique aspects of the Waterloo system.

Farm Characteristics and Production

There were 1,444 farms in Waterloo Region in 2001 compared to 1,590 farms in 1996. While the number of farms in the region is declining, the rate of decline is slower than the provincial average. The total area of land being farmed in Waterloo Region also declined during this period. Between 1996 and 2001 the area of land farmed in Waterloo Region declined by 3.7% from 234,400 acres to 225,800 acres.

Farms in Waterloo Region are smaller than the provincial average. In 2001 the average farm size in Waterloo Region was 156 acres compared to 226 acres for the province. This difference is largely explained by the concentration of livestock farms in Waterloo Region, particularly dairy and beef farms, which are on average smaller than field crop type farms. Livestock farms account for 66% of all farms in Waterloo Region in comparison to the province where livestock farms account for 45% of all farms.

Dairy farms are the most numerous type of farm in Waterloo Region followed closely by beef farms. Between 1996 and 2001 the number of dairy farms in Waterloo Region increased from 256 farms to 296. During the same period the number of beef farms remained constant at 289 farms. The increase in dairy farms represents an important trend especially in light of the significant decline in dairy farms across Ontario. Waterloo Region now ranks as the 6th largest milk producing region in Ontario and production is continuing to increase. Although dairy and beef farms combined account for 42% of all farms in Waterloo Region, a variety of other farm types including hog, poultry, field crop, vegetables, fruit and specialty products account for the balance of farms in the region and promote a diverse rural economy.

Waterloo Region has one of the most economically productive land bases in the province. Each of the individual municipalities/townships in the region exceeded the provincial average in terms of total farm receipts per farm and per acre. With an average of $1,681 in farm receipts per acre of farmland in 2000, Waterloo Region reported the second highest level of productivity on a per acre basis in Ontario, exceeded only by the Niagara fruit belt. On average, net revenue per farm at $39,000 was almost twice the Ontario average of $21,534 in 2000. The high level of productivity per farm and per acre is closely associated with the focus on livestock in Waterloo Region.

The economic importance of the farming sector in Waterloo Region is further demonstrated by the employment and sales expenditure multipliers that are generated through linkages with other sectors of the local economy. Results from a comprehensive survey of 196 agri-related businesses in Waterloo Region indicate that every job in the local agriculture sector supports an additional four jobs in the wider

economy. As well, each dollar of farm income generates an additional $2.40 in sales related to agriculture in the wider economy.

Despite the successes experienced by the agriculture sector, farming remains a highly stressful occupation for many farmers who have to cope with a variety of factors beyond their control including weather, fluctuating market prices and inadequate returns (Rural Health Study in Waterloo Region – Interim Report, March 2003, p.29). Farming costs have grown faster than the revenues from the farm products and have led to a chronic dependency on support programs (Odyssey Report, September 2002, p.57). Although new technology, bio-technology and genetic improvements have helped offset reduced profit margins, they have in turn led to increased capitalization and larger farming enterprises (Odyssey Report, p.57).

Concentrations in Food Processing

The meat processing and bakery sub-sectors make up over half of Waterloo Region's food-related industries and 65% of its food-related industries' employment. Waterloo Region's food-related companies are concentrated in Kitchener. Comparison of the region's human food, meat product and bakeries and tortilla manufacturing sectors to the province shows that the region is specialized in these sectors, particularly in meat product manufacturing.

Farmers' Markets

Waterloo Region features four farmers' markets that offer consumers a personal connection with local food producers. Food freshness is seen as the most important attraction at local farmers' markets. There is also growing interest in organics and ready to eat products. Consumers spend over $20 million annually at farmers' markets in Waterloo Region. The region is famous nationally and internationally for its farmers' markets and they serve both local needs and as day trip destinations. While each of the existing farmers' markets has a loyal customer base, each needs to maintain and add to its base if it is to remain viable over the long term. Market displays and advertising represent one approach to promoting local producers and products. With a variety of related special events such as the Elmira Maple Syrup Festival, Wellesley Apple Butter and Cheese Festival and Oktoberfest occurring on a regular basis, opportunities exist to promote both a market visit and participation in a special event as part of the same outing.

Economic Pressures and Productivity Improvements

All three sectors are striving to improve productivity to keep costs in check and to maximize profits. Farmers, in moving to address lower per unit returns, are increasing the size of their operations, becoming more mechanized, and reducing their labour needs (Odyssey Report, 2002). Food processors are also becoming increasingly automated and are consolidating where appropriate (Connor, 1997). Food stores are consolidating, introducing a variety of new store formats, adopting electronic

approaches, revising business practices and introducing home-meal replacements to remain competitive (Toronto Food Policy Council, 1996; Cotterill, 2000). Food services are adopting new technology and business practices. Computer software and labour saving equipment are being used extensively across all sectors (Statistics Canada, Farming Facts, 2002).

Notwithstanding this effort, Statistics Canada data indicates that the total value added/employee in Waterloo Region's food processors is lagging behind that of the province except for meat product manufacturing. While wage rates and salaries are lower in the region then the province for the human food manufacturing cluster and meat product manufacturing, they are higher for bakeries and tortilla manufacturing. This suggests that there is further room for productivity improvement, particularly in the secondary sector. Consideration should be given to helping local primary producers and food processors learn new approaches and access new sources of capital that would help them improve productivity.

Improving Local Links

Increasingly our food production, manufacturing and sales systems are disconnected from the local economy. The average distance traveled by truck to deliver food has increased over the years resulting in growing environmental costs (Pirog, 2001). Associated with the increased usage of transportation networks for distributing food is the concern that food products are being developed for durability during shipping and longer shelf life at the expense of palatability and nutritional content (Kloppenburg, 1995).

Manufacturing facilities have become larger and more centralized. Most purchasing decisions for supermarket chains are made in head office and delivered through centrally located company controlled distribution systems. Local managers of corporate stores have little opportunity to buy locally. Similarly, few food service operations in Waterloo Region currently purchase directly from producers. This poses a major challenge to local producers, particularly small-scale producers, in getting their products onto local store shelves and food service menus.

To address this challenge, producers are using a variety of direct selling techniques including farmers' markets, community supported agriculture farms, subscription farming, commercial direct marketing, on-farm marketing, u-pick farms, and home delivered routes. While not a panacea for all, the survey data presented in this report indicates that some farms in Waterloo Region are deriving over 50% of their total farm receipts from direct sales. Opportunities for improving direct linkages between farmers and consumers in Waterloo Region have increased in recent years through the efforts of the Buy Local Working Group and the introduction of the "Buy Local! Buy Fresh!" map.

Beyond the "Buy Local! Buy Fresh!" campaign, stakeholders may also want to consider other possible approaches to improving local links. The creation of a local food terminal

or distribution system which pools the outputs of a number of small producers would be one approach. Another option is to expand local educational and marketing material to reach out to markets such as restaurants, hospitals, educational institutions, seniors homes and other institutional food services.

Need for Better Information, Research and Training

All three sectors are experiencing ongoing change and as a result need useful and timely information if they are to successfully adapt to changing conditions. The farm economy, in particular, is in a state of flux and farmers are scrambling to adjust to changing circumstances.

At the same time consumers are increasingly demanding that producers, processors and distributors offer foods with more taste, greater variety and more nutritional value (Toronto Food Policy Council, 1995). Associated with this is the growing market for products of local farmers and a greater desire to purchase foods from the region where people live (Cummings et al, 1999; Toronto Food Policy Council, 1995). As well, the market for new foods processed in different ways is expanding in conjunction with rapid changes in the ethno-cultural mix of the Ontario population (Toronto Food Policy Council, 1995).

As some producers find it difficult to change quickly, fresh approaches would be helpful for those who are struggling to gain the information they need to move forward. This could include creative approaches such as mentoring, web based tools, marketing assistance, research links with nearby universities and custom training programs to meet specific needs.

Changes in Consumer Behaviour

While a host of consumer actions impact on the food system, the following national trends as identified by Statistics Canada (Food Consumption Highlights, 2002) and other sources are particularly significant for the Waterloo Region agri-food economy:

- **decline in per capita consumption of red meat** - given the importance of livestock production and meat processing in the Waterloo Region food economy, the decline in consumption of red meat raises concerns regarding the long term prospects of these two activities. Farmers, processors and other industry stakeholders may have to work more closely to ensure that the sector remains as competitive as possible. This could involve finding new markets for red meat products and exploring ethnic and other niche markets.

- **increase in per capita consumption of poultry** - the increased demand in poultry production may offer opportunities for both new producers and processors and for existing producers and processors who may be negatively impacted by the reduction in red meat consumption.

- **increase in per capita consumption of fruit and vegetables** – relatively few farms in Waterloo Region derive the majority of their total farm income from fruit and vegetable production (8 fruit farms and 15 vegetable farms in 2001). However, there are a considerable number of mixed farming operations in Waterloo Region that derive some of their total revenue from growing fruits and/or vegetables. As consumers include more fruits and vegetables in their diets there may be opportunities for new and existing operations, particularly for those growing unique varieties and serving niche markets.

- **increased interest in organic products** (Statistics Canada, 1999) - the relatively small number of farms currently producing certified organic products in Waterloo Region (21 farms in 2001 or 5% of the provincial total) and growing consumer interest in organic products would suggest that there may be room for growth in this area.

- **increased consumption of certain dairy products** - given the growing importance of dairy farming in Waterloo Region and the presence of only one milk processor in the region, opportunities may exist for new milk processors, particularly for those focusing on specialty cheeses and similar niche markets.

- **increased consumption of vegetable oils and cereal products** - as soybean production increases and consumer interest in soy-based products increases, new opportunities may arise for oil seed milling in Waterloo Region. Opportunities may also exist for specialty grain production and processing as consumption of bakery products and cereal-based snacks increase.

- **increased consumption of food outside the home** - food cooked at home is becoming less important as lifestyle situations and choices place greater time constraints on consumers. Consumers now spend 1/3 of their food dollar on meals outside the home compared to 1/6th 30 years ago (Statistics Canada/Little and Bennett, 2000). This will continue to offer opportunities to the food service industry to expand in new and creative ways.

- **increased interest in day trips and similar outings** (Statistics Canada, Domestic Travel, July 2002) - given the proximity of Waterloo Region to a significant population base and the general aging of the population, a host of opportunities in "entertainment farming" and "agri-tourism" would merit consideration. The focus on local maple syrup production and related activities is indicative of what can be done in this area.

Land Related Issues

Each of the three sectors is dependent on a land base to carry on its activities. Not surprisingly, each faces both common and sector specific issues in dealing with its land base. Common issues across sectors include ease of access, land use compatibility

with neighbouring uses, land costs, flexibility in land use controls, municipal taxation and adequacy of local infrastructure – water, sewer, hydro and gas.

Issues particular to the primary sector, which are reflected in trends reported in the Agricultural Census data, include loss of farmland, a reduction in the number of farms and the high percentage of land that is rented in some local municipalities. The decline in farmland area in Waterloo Region raises long-term concerns about the viability of agriculture particularly in areas abutting existing urban areas. A number of societal pressures including population growth, an increase in leisure time and disposable income, and increased mobility of the workforce are all contributing to the movement of non-agricultural residents into rural areas (Odyssey Report. 2002). At the same time, the overall decline in the number of farms raises important questions about the long-term viability of smaller rural communities in Waterloo Region and the ability of the remaining rural population to support key farm services and the local tertiary sector. The relatively high percentage of farmland that is rented in certain areas of the region has both positive and negative implications. On the positive side, it makes land available for those wishing to expand with a minimum capital outlay. On the negative side, it raises concerns over whether such lands are being managed in a sustainable fashion and whether such lands will remain in agriculture over the long-term.

While local land use controls are primarily the responsibility of local municipalities, the Regional Municipality of Waterloo can and does play a co-ordinating and leadership role in this area in addressing both the common and unique needs of each sector. Understanding the needs of each sector will be particularly important as the regional government moves to implement its Regional Growth Management Strategy and to develop its Regional Transportation Master Plan.

Greater Attention to Agri-Food Interests in Economic Development Activities

Given the importance of agriculture and food-related activities in the regional economy, promoting the agri-food economy will be a key factor in fostering its long-term viability. Current economic development programs tend to focus on urban employment opportunities and overlook the many economic benefits of supporting a vital rural community.

While Waterloo Region has been reasonably successful in attracting “footloose” food processing operations, there is no specific strategy in place to attract this type of processor and to retain and further develop the supply-oriented and demand-oriented operations currently in place. A number of processors have been in Waterloo Region for an extensive period of time. However, food processing is highly competitive and historical presence does not guarantee future presence. As companies are generally affected by both push and pull factors in determining whether to relocate, a supportive environment is needed to ensure the interests of the agri-food sector are not being overlooked.

Agri-Food Input into Policy Development and Regional Decision Making

Given the range of interests involved in the agri-food economy and the wealth of knowledge present amongst those interests, industry stakeholders can play an important role in aiding decision makers in the development of agri-food policy. The development of Foodlink Waterloo Region resulted from broad consultations with local food system stakeholders including representatives from the non-profit, government and agriculture sectors.

The development of a regional Agriculture and Food Advisory Committee represents another option for incorporating industry stakeholders in agri-food policy development. Such a committee could provide Regional Council with timely input on key issues facing the three key sectors of the food system and take responsibility for the development of an overall strategy to ensure that the food system continues to make a major contribution to the economic, social and environmental well-being of the region for years to come.

Recommendations

Based on the research and analysis provided in the study, it is recommended that Region of Waterloo:

1. Ensure that the preservation and protection of farmland remain an integral part of the Region's Growth Management Strategy.

2. Explore options to establish an advisory board to advance agriculture and food policy development.

3. Initiate a process for Waterloo Region branding of locally grown and processed products.

4. Undertake consumer research relevant to the promotion of locally produced food.

5. Continue to explore and develop options for institutional purchasing of locally produced food.

6. Initiate communications with food retailers to explore options for increasing the availability of locally produced foods on supermarket shelves.

7. Continue with the promotion of balance in agriculture production in order to respond to nutritional requirements for healthy diets for its population.

8. Public health develop a communication campaign to stimulate increase in the consumption of locally produced fruits and vegetables.

Acknowledgements

The preparation of this report was guided by a dedicated steering committee with representatives from Waterloo Region Public Health, Human Resources Development Canada, the Waterloo Federation of Agriculture, the Ontario Ministry of Agriculture and Food, Waterloo Wellington Training and Adjustment Board, the Woolwich Community Health Centre, Canada's Technology Triangle, and Planning, Housing and Community Services, Region of Waterloo.

A special thanks goes to the members of the steering committee, and to the many individuals and businesses that completed the various surveys used to gather input. It is hoped that readers find the report informative and through it gain a better understanding of the important role played by agriculture and food-related activities in the life of Waterloo Region.

Sincerely,

The Waterloo Food Economy Study Steering Committee

October 2003

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~ Growing Food and Economy ~
Economic Impact Study of the Agriculture and Food-Related Sectors in Waterloo Region

1.0 Introduction

The economy of Waterloo Region has undergone a number of significant changes over the past 20 years. Like many other Canadian communities, the economic recessions of the early 1980s and 1990s impacted Waterloo Region as many industries down-sized or closed in response to depressed consumer demand, labour-displacing technologies and lower production costs in other countries (Torjman and Hodgson, 1998). In the first half of the 1990s, close to 50 manufacturing plants closed resulting in the loss of 15,000 manufacturing jobs and thousands of spin-off jobs (Opportunities 2000 Project, undated). However, by the late 1990s the regional economy recovered as a result of growth in high-value, knowledge-intensive industries like computing hardware and software, telecommunications equipment, engineering, environmental design, biotechnology, and the expansion of the finances, insurance and real estate sector (Community Opportunities Development Association, 1997; Human Resources Development Canada, 2001).

The evolution has led to a shift in attention away from the role played by the region's more traditional industries, particularly the agri-food industry, to the role played by its emerging industries. However, recent research conducted in several Ontario counties suggests that agriculture continues to have a significant economic impact on regional economies (Cummings and Associates, 2000). Furthermore, the research indicates that the entire agri-food industry is evolving rapidly and employment in services related to agriculture has grown and become more diversified in terms of occupations employed and skills required (Cummings and Associates, 2000; Gordon, 2002).

1.1 Purpose of the Report

The purpose of this report is to take a fresh look at the role played by the agri-food industry in the economy of Waterloo Region. In particular, it is intended to inform program and policy development work within the Region of Waterloo Public Health. The Department recognizes the important role played by the food system in the creation of healthy communities and is interested in better understanding the magnitude and relative importance of key sectors in the Waterloo Region food system. The report is also intended to help the broader community better understand the nature and economic significance, in terms of dollars and jobs, of the local agricultural economy and food system. Only by better understanding the important role played by food-related activities can the various participants in the agri-food economy work together to make decisions which are economically sound, environmentally sustainable and socially responsible.

1.2 Study Area

The study area consists of Waterloo Region and its seven local municipalities – The City of Cambridge, The City of Kitchener, The City of Waterloo, The Township of North Dumfries, The Township of Wellesley, The Township of Wilmot, and The Township of Woolwich. Waterloo Region is located along Highway 401 approximately 95 kilometres west of Toronto. It covers an area of 134,270 hectares and is within a day's drive of 130 million customers.

Waterloo Region has a diverse and internationally oriented economic base. In 2000, it exported $8.9 billion worth of products or roughly 55% of its gross domestic product (total value of all final goods and services produced) for that year (Prosperity Forum, 2003, p.1). It has a labour force of 232,905 (2001) with 59,325 (2001) being involved in various types of manufacturing. Its three largest manufacturing employers are Toyota Motor Manufacturing Canada Inc. with 2,800, ATS Automation Tooling Systems Inc. with 1,914 and Budd Canada Inc. with 1,820 employees. It has a high level of foreign ownership (over 196 firms) with approximately 31% of its employment being directly related to foreign investment (Prosperity Forum, p.3).

Between 1995 and 2000, median employment income in Waterloo Region rose 16% reaching $27,700. During the same period, Ontario's median employment income rose 13% reaching $26,000 (Prosperity Forum, p.3).

Waterloo Region's population of 469,800 (2002) constitutes 168,050 households (2002), is growing at a rate of approximately 1.5% per year, and is expected to reach 558,000 by 2016. Between 1996 and 2001, in-migration exceeded out-migration by 25,000, with 91% of this number being less than 44 years old. As a result of its ability to attract young people, Waterloo Region (Kitchener CMA) has the third youngest Census Metropolitan Area in Canada with a median age of 35.6 (Prosperity Forum, p.1).

Waterloo Region has a significant Mennonite population which adds a unique and important dimension to its economy, particularly to that of its rural area.

1.3 Model of Waterloo Region Food System

The modern food system is complex. It is made up of:

> all processes involved in keeping us fed: growing, harvesting, processing, packaging, transporting, marketing, consuming and disposing of food. It also includes the inputs needed and outputs generated at each step. The food system operates within and is influenced by social, economic and natural environments. Each step is also dependent on human resources that provide labour, research and education (Wilkins, 2003, p.1).

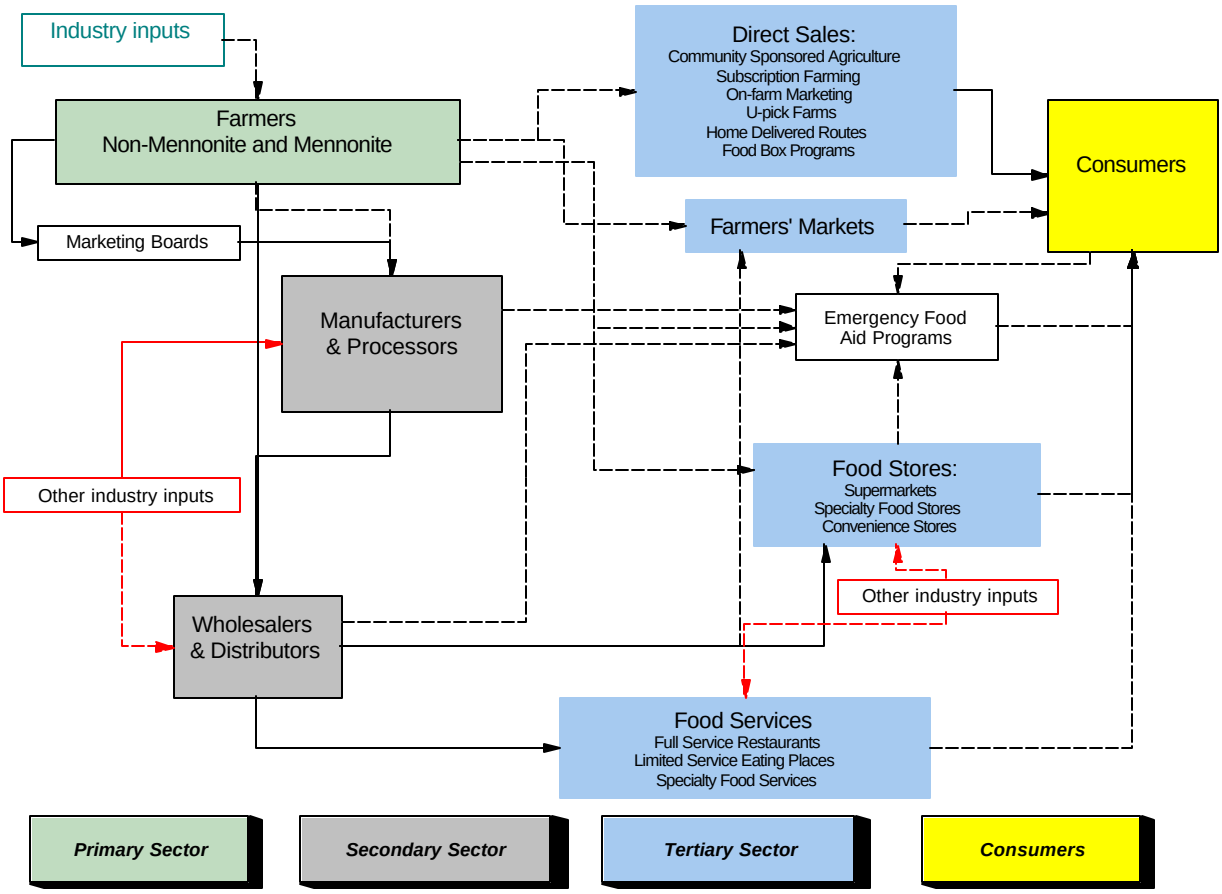
This report looks at the food system as it currently operates in Waterloo Region. In particular, it focuses on developing a better understanding of the economic significance

of three key components of the system – the primary, secondary and tertiary sectors. Whereas most recent agricultural impact studies have looked at the important role played by the primary sector in a county or regional economy, this study provides a more complete picture of the agri-food economy in Waterloo Region by including the secondary and tertiary sectors.

For the purposes of the report, the primary sector includes those involved in the operation of farms and support activities for farms. The secondary sector includes those involved in the commercial preparation, processing, manufacturing, packaging, storing, wholesaling and distribution of food for human consumption. The tertiary sector includes those involved in the direct sale of food to the consumer.

Figure 1.1 illustrates how the various sectors are linked in the Waterloo Region food system. Farmers (primary sector) utilize a variety of inputs (seed, fuel, machinery, etc.) to produce outputs (grains, vegetables, fruits, milk, livestock, poultry, etc.) which are sold directly to consumers, to marketing boards, to manufacturers, to wholesalers, and occasionally to food stores. Manufacturers (secondary sector) use farm outputs to produce a wide range of products which are then distributed, often through wholesalers (secondary sector), to food stores and food services. In some cases, wholesalers will sell to farmers' markets and to food box and similar programs. Food stores, food services, farmers' markets and direct sales operations (tertiary sector), in turn, sell food items to the consuming public. Also depicted on Figure 1.1 are flows which depict the periodic contributions made by all three sectors and the consuming public to emergency food aid programs.

Figure 1.1 Waterloo Region Food System



1.4 Study Approach

The overall study approach included the following steps:

- conducting a thorough review of pertinent literature;
- summarizing secondary data;
- compiling lists of food producers, food processors/wholesalers/distributors, food retailers and agri-related businesses;
- designing surveys for, and administering surveys to, each of the groups of interest;
- analyzing the data;
- developing a model of the food economy in Waterloo Region;
- describing the food economy in a report format; and
- developing and implementing a communication plan.

The study process used a multi-stakeholder approach and efforts have been made to listen to, and include representatives from the different sectors of the food system. A steering committee, made up of representatives from the Regional Municipality of Waterloo, Human Resources Development Canada (HRDC), the Waterloo Federation of Agriculture (WFA), the Ontario Ministry of Agriculture and Food (OMAF), the Waterloo Wellington Training and Adjustment Board (WWTAB), the Woolwich Community Health Centre and Canada's Technology Triangle (CTT), provided valuable input and guided the implementation of the steps noted above.

Many of the stakeholders shared a similar interest with the Region of Waterloo Public Health in gaining a better understanding of the magnitude and relative importance of key sectors in the Waterloo Region food system. The study also served to address specific areas of interest of the different stakeholders. HRDC was interested in gaining a better understanding of labour market issues in the food system including trends and emerging issues, and identifying skills gaps and barriers to hiring. Similarly, WWTAB was interested in the agricultural situation in Waterloo Region with respect to changing skills requirements associated with production, processing and marketing activities. WWTAB was also interested in identifying labour market expansion and contraction in agriculture and emerging occupations and entrepreneurial activities.

WFA and OMAF were both interested in assessing agriculture's linkages other business sectors and its total economic contribution to the local economy in terms of jobs and sales. The Department of Planning, Housing and Community Services (Regional Municipality of Waterloo) was interested in determining the significance of the food economy in the regional economy as well as identifying areas of specialized production, areas of underrepresented agriculture and food economy activities, and opportunities for economic growth.

To gauge the relative importance of food and agriculture in Waterloo Region's economy, particular attention was paid to assembling sales, employment and when available, value added data, for the three sectors of interest – primary, secondary and tertiary. Within the primary sector, additional approaches were devised to measure the impact of

the sector on agri-related businesses. The study process drew on input from the different stakeholders in identifying data sources and developing a mixture of research tools. Table 1.1 outlines the data sources and methods of data collection that were employed for each sector.

Table 1.1 Data Sources and Methods of Collection

Sectors	Data Sources and Methods of Collection
Primary	• Population Census and Census of Agriculture: 1991, 1996, 2001, Statistics Canada
Agri-related businesses	• Survey of Agri-related businesses from 12 different industrial sectors in Waterloo Region
Secondary	• North American Industrial Classification System (NAICS) codes, Statistics Canada • Manufacturing Data for 1999 for Ontario and Waterloo Region, Statistics Canada • Canada's Technology Triangle Manufacturers Directory 2002 • Scott's Ontario Manufacturers Directory 2002 • Survey of secondary sector companies
Tertiary	• Retail studies of the Waterloo Region: specialty grocers, farmers' markets reports, retail sales data from Statistics Canada • Survey
Direct Sales	• Survey of non-Mennonite and Mennonite operators using telephone and hand-delivered approaches • Waterloo Federation of Agriculture, Food Link Report, & Buy Local Guide • Canada Census of Agriculture 1981, 1991, 1996, 2001

Chapters 2, 3 and 4 describe in greater detail the specific methods used to assess each sector.

1.5 Structure of Report

The report is divided into 5 chapters. Chapter 2 speaks to the importance of the primary sector in Waterloo Region. It provides a summary of primary sector trends in the broader food system, moves to a description of the methodology used to assess the primary sector and agricultural related businesses in Waterloo Region, presents a host of primary sector findings in the form of a "Profile of Agricultural Sector in Waterloo Region" and concludes with a discussion of findings on "Agricultural Related Business and Economic Impact. Chapters 3 and 4 present similar information for the secondary and tertiary sectors respectively. Chapter 5 presents an integrated perspective of the Waterloo Region Food Economy by providing a more detailed model of the system, an overview of the three sectors taken as a whole and a discussion of key cross-sectoral themes that have emerged and what might be done about some of them. The Appendices contain supporting information.

For those interested in additional background information, attention is directed to Appendix A which contains the literature review prepared for the study. It draws on a

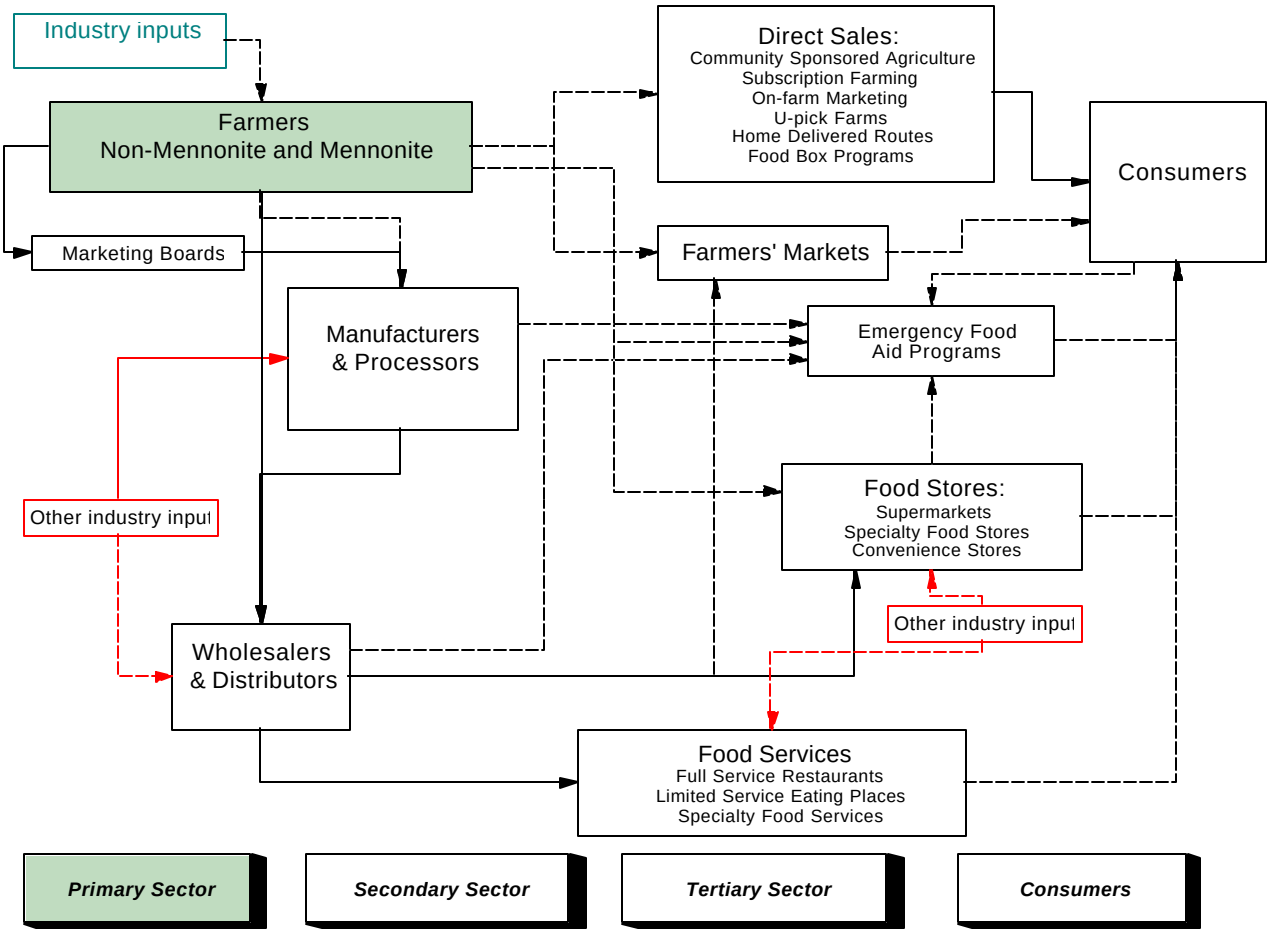
variety of reports, journal articles, Internet and other sources to provide an overview of recent related work. It touches on the overarching topic of food systems and associated models, speaks to trends in the three sectors being considered and offers a summary of recent consumer trends. Appendix A also provides an extensive review of agricultural employment trends and issues as part of the profile on the primary sector. This includes an examination of broad trends affecting employment in agriculture at the national, provincial and regional level, and a review of skill and training trends, issues and needs in agricultural employment.

2.0 Primary Sector

2.1 Introduction

This chapter examines the primary sector of the Waterloo Region Food System i.e. those involved in the operation of farms and support activities for farms. It begins with a summary of primary sector trends in the broader food system, moves to a description of the methodology used to assess the primary sector and agricultural related businesses in Waterloo Region, presents a host of primary sector findings in the form of a "Profile of Agricultural Sector in Waterloo Region" and concludes with a discussion of findings on "Agricultural Related Business and Economic Impact".

The chapter describes key attributes of the agricultural component of the Waterloo Region Food System and provides insight into important economic links between producers and related industry inputs.



2.2 Summary of Primary Sector Trends in the Broader Food System - from the Literature Review (Appendix A)

The primary sector is experiencing significant change and multiple challenges. The number of farms is decreasing and farm size is increasing (Statistics Canada, 2001). Farmers are struggling with decreasing operating margins and increasing competition from corporately-controlled operations and the impacts of globalization and the introduction of market distorting subsidies by national governments (Statistics Canada, 2002a; Kirshenmann, 2003a, and 2000b; Hefferman, 1999). Greater use is being made of labour saving equipment and processes to improve productivity. This increased use of capital, in turn, is resulting in more time being spent on the business management component of agricultural operations. New Ontario government regulations governing nutrient management and other farm practices are expected to result in further cost pressures (Odyssey Report, 2002). The agricultural work force is aging and it is becoming more difficult to attract young people into farming (Statistics Canada, 2001; Yourk, 2002). Land prices, particularly near rapidly urbanizing areas, are escalating quickly (Odyssey Report, 2002). More farms are deriving at least a portion of their income from off-farm employment (Martz and Brueckner, 2003).

Sophisticated technology is being used increasingly on farms – computers, geographic information systems, high tech farm equipment and biotechnology. The Internet is being used for a variety of purposes including the marketing of farm products. New skills and training are often needed to make the necessary transition to modern farming (Odyssey Report, 2002). In fact, technology and new products and markets may be forcing a complete re-description of what it means to be a producer or farm operator.

As people with urban backgrounds move into rural areas, potential for conflict increases. Non-agricultural residents often have little understanding of farm operations and are not accustomed to farm smells, to the need to occasionally work late to get the crop in and so on (Odyssey Report, 2002). In addition, as people with urban backgrounds replace those with traditional farm backgrounds, the support system available to the remaining farm population is often diminished.

2.3 Methodology

2.3.1 Methodology Used to Develop Agricultural Sector Profile for Waterloo Region

The study used data from the 1991, 1996 and 2001 Census of Agriculture to provide a statistical overview of the agricultural industry. Information from the Ontario Ministry of Agriculture and Food, various agricultural commodity groups and the Waterloo Federation of Agriculture was also used in describing the agriculture sector. The analysis included farm production and farm operator data at the Census Division level (Waterloo Region) and the Census Sub-division level (North Dumfries, Cambridge, Kitchener, Waterloo, Wilmot, Wellesley and Woolwich). The profile provides a comparative analysis of the individual municipalities as well as Waterloo Region in

relation to the province. The profile of the primary sector examines historic and current trends in the following categories:

Agriculture Production and Operator Profile

- Number of farms and farms by size category
- Land area classified by agricultural use
- Number and types of farm operations (i.e. dairy, beef, crops, fruit, specialty, etc.)
- Production characteristics (crops by area of production, livestock and poultry inventory, etc.)
- Characteristics of farm operators (age, gender, etc.)

Agricultural Economics

- Total gross farm receipts and farms by sales category
- Gross farm receipts per acre of farmland
- Total operating expenditures
- Operating expenditures by expense category
- Net revenue per farm
- Total farm capital
- Farm capital per farm
- Agriculture's value added contribution

2.3.2 Methodology Used to Assess Agricultural Related Businesses and Economic Impact for Waterloo Region

A comprehensive survey of agri-related businesses in Waterloo Region was conducted to identify the linkages between agriculture and other sectors of the economy and the economic impact of these linkages in terms of jobs and sales. Agri-related businesses include businesses that either buy products and/or services from farmers or sell products and/or services to farmers. Examples of such businesses include livestock feed and farm supply businesses, farm machinery dealers, equipment/vehicle repair shops, cold storage facilities, trucking firms (livestock, produce, milk, etc.), fuel suppliers, seed and chemical dealers, concrete manufacturers, quarries, banks, accountants, lawyers, etc.

In addition to identifying the value of agri-related sales and the number of agri-related jobs, the survey identified the types of products and/or services offered by local agri-related businesses and location of sales (within the study area vs. outside or export sales). The survey also identified the types of farm products being purchased by agri-related businesses and location of these purchases (within the study area vs. imports). The analysis provides information on human resource issues related to the various industries that support agriculture.

2.4 Profile of Agricultural Sector in Waterloo Region

2.4.1 Introduction

This section presents a profile of the Agriculture Sector in Waterloo Region. Data for the analysis were drawn from the Census of Agriculture, which is conducted every five years. The census organizes data at a number of levels: Canada, Province/Territory, Census Division (i.e. County, Regional Municipality, District), and Census Consolidated Subdivisions (i.e. townships, towns, etc.).

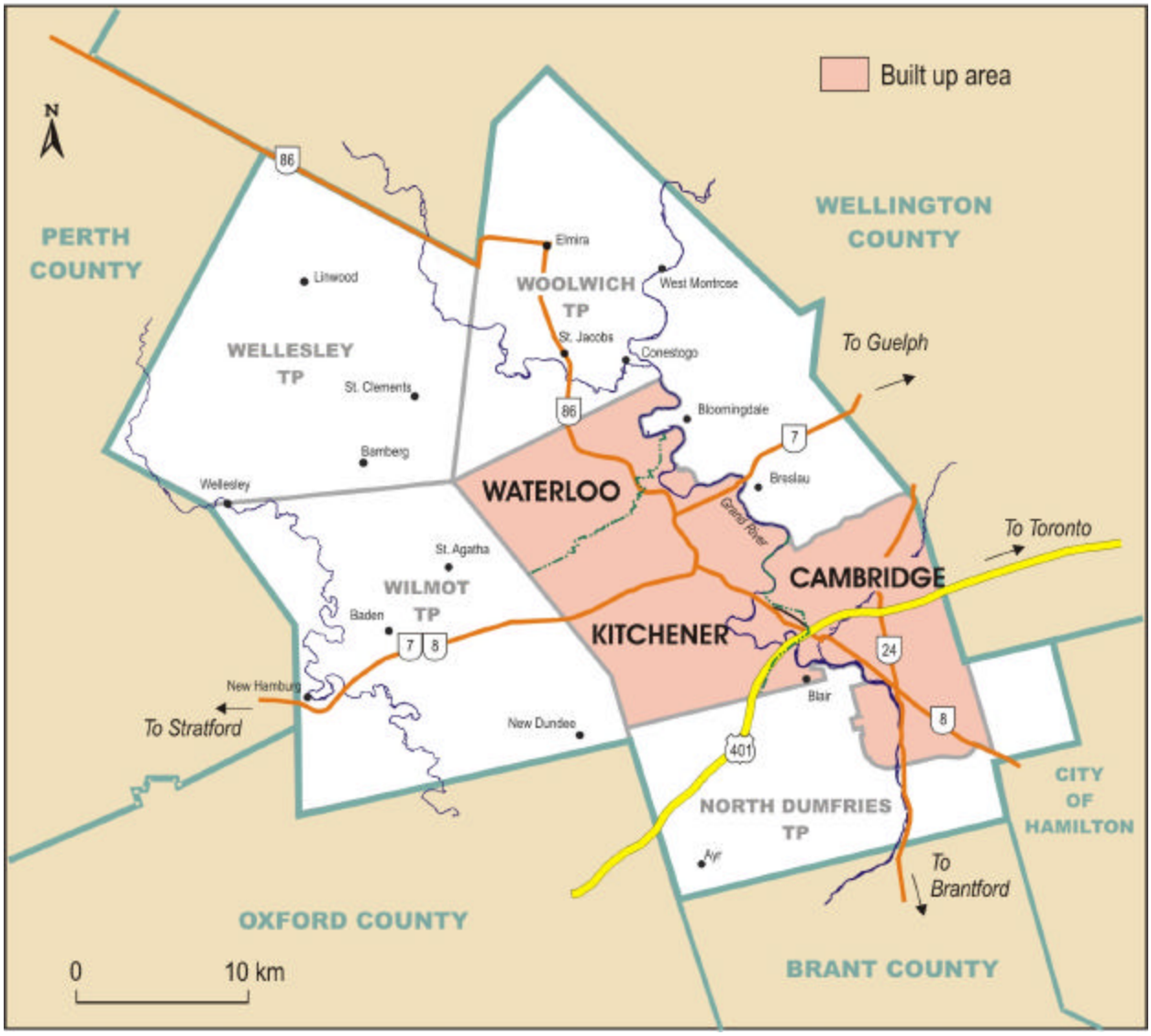
Waterloo Region consists of seven consolidated subdivisions: North Dumfries, Cambridge, Kitchener, Waterloo, Wilmot, Wellesley and Woolwich. As shown in Map 2.1, Cambridge, Kitchener, and Waterloo represent major urban centres in Waterloo Region. The acreage 'farmland' (i.e. land being farmed) in these municipalities is considerably less than the rural municipalities.[1] In 2001, the combined farmland in Cambridge, Kitchener and Waterloo amounted to just under 10,000 acres or 4% of the total farmland in Waterloo Region (Table 2.1). However, farming activity in the urban fringe areas continues to make a significant economic contribution.

Waterloo Region features a number of urban centres throughout the four rural municipalities that continue to provide important business services to the agricultural sector. Some of the larger centres include Elmira, Linwood, Ayr, New Hamburg and Wellesley.

An analysis of the trends and changes in farmland area and farm size, farm types, farm productivity, farm receipts, and net revenues as well as farm capital is provided for the census years 1996 and 2001. Due to confidentiality constraints, the data for Kitchener and Waterloo have been combined by Statistics Canada and are presented as 'Kitchener' in this chapter.[2]

[1] Statistics Canada associates the following land uses with farmland: land in crops, land in pasture, land occupied by farm buildings and yards, land used for other farm-related activities such as farm woodlots.
[2] Statistics Canada suppresses data for census areas where there are too few farms to ensure confidentiality. Statistics Canada reports on suppressed data by combining data for two or three neighbouring municipalities.

Map 2.1
Region of Waterloo
Municipalities and Communities



Source: Harry Cummings and Associates Inc., 2003.

2.4.2 Number of Farms and Farmland Area

In 2001, Waterloo Region reported 1,444 farms (Table 2.1).[3] This reflects a 9.2% decline from 1,590 farms in 1996. During the same period, farm numbers in Ontario declined by 11.5%. Farm operations in Ontario declined from 67,520 in 1996 to 59,728 in 2001.[4]

At the Census Subdivision level, Wellesley reported the most farms in 2001 at 501, slightly more than Woolwich which reported 494 farms (Table 2.1). These two municipalities account for close to 70% of all farms in Waterloo Region. Each of the six municipalities reported a decline in farm numbers between 1996 and 2001. The rate of decline was highest in Cambridge and Kitchener at 23.8% and 32.5% respectively. In terms of absolute numbers, Waterloo Region lost a total of 146 farms between 1996 and 2001. Much of the loss (57.5%) occurred in Woolwich and Wilmot, which reported 48 and 36 fewer farms respectively between the two periods.

In 2001, Waterloo Region reported a total of 225,800 acres of farmland (Table 2.1). This represents 1.7% of the provincial total. Between 1996 and 2001 the area of farmland in Waterloo Region declined by 3.7% (8,606 acres), which is a slightly higher rate of decline than the provincial average of 2.68%. North Dumfries reported the largest decline in farmland area at 3,637 acres followed by Woolwich at 2,426 acres.

Table 2.1 Number of Farms, Farmland Area, Average Farm Size and Percent Change 1996-2001

	1996			2001			Percent change '96-'01		
	Total farms	Total acres	Average farm size	Total farms	Total acres	Average farm size	Total farms	Total acres	Average farm size
Ontario	67,520	13,879,565	206	59,728	13,507,357	226	-11.5%	-2.7%	10.0%
Waterloo Region	1,590	234,406	147	1,444	225,800	156	-9.2%	-3.7%	6.1%
North Dumfries	134	28,706	214	117	25,069	214	-12.7%	-12.7%	0.0%
Cambridge	42	5,816	138	32	5,001	156	-23.8%	-14.0%	12.9%
Kitchener	43	5,638	131	29	4,329	149	-32.6%	-23.2%	13.9%
Wilmot	307	52,784	172	271	53,839	199	-11.7%	2.0%	15.6%
Wellesley	522	61,867	119	501	60,393	121	-4.0%	-2.4%	1.7%
Woolwich	542	79,595	147	494	77,169	156	-8.9%	-3.1%	6.4%

Source: Statistics Canada, 1996 2001.

Farms in Waterloo Region are smaller than the provincial average. In 2001, the average farm size in Waterloo Region was 156 acres compared to 226 acres for the province. On average, farms in North Dumfries are the largest in Waterloo Region at 214 acres followed by Wilmot at 199 acres. Wellesley has the smallest average farm size at 121 acres.

[3] Statistics Canada defines a census farm as an agricultural operation that produces at least one of the following products intended for sale: crops (field crops, tree fruits or nuts, berries or grapes, vegetables or seed); livestock (cattle, pigs, sheep, horses, exotic animals, etc.); poultry (hens, chickens, turkeys, exotic birds, etc.); animal products (milk or cream, eggs, wool, fur, meat); or other agricultural products (greenhouse or nursery products, Christmas trees, mushrooms, sod, honey, maple syrup products).

[4] The Agriculture Census includes information on farms operated by Mennonites.

While farm numbers have been consistently shrinking over the past few census periods, farm consolidation has resulted in larger farms. The average farm size in Waterloo Region increased by 6%, between 1996 and 2001. The largest rate of increase occurred in Wilmot at 15.5%, which is higher than the provincial rate of 10% (Table 2.1).

Approximately 30% of the total farmland area in Waterloo Region is leased or rented (Table 2.2). While this is similar to the provincial average, there is considerable variation within Waterloo Region. In Wellesley only 16% of the farmland area is rented compared to 38% to 40% in North Dumfries, Cambridge and Wilmot.

Table 2.2 Land Tenure in Ontario and Waterloo Region, 2001

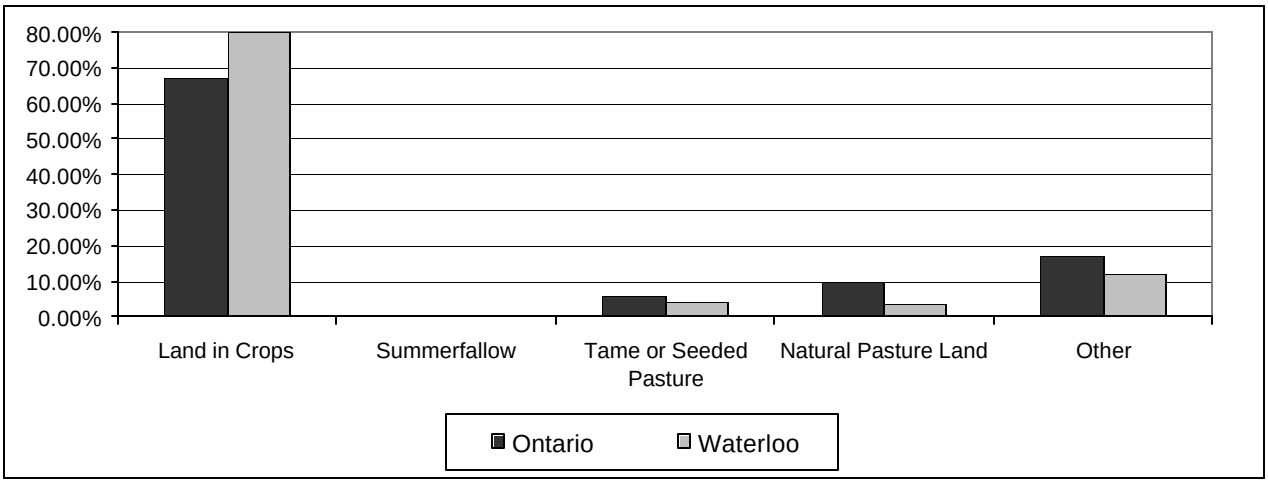
	Total acres of farmland	Area owned	% owned	Area rented	% rented
Ontario	13,507,357	9,373,178	69.4%	4,134,179	30.6%
Waterloo Region	225,800	154,890	68.6%	70,910	31.4%
North Dumfries	25,069	15,349	61.2%	9,720	38.8%
Cambridge	5,001	2,996	59.9%	2,005	40.1%
Kitchener	4,329	2,900	67.0%	1,429	33.0%
Wilmot	53,839	31,947	59.3%	21,892	40.7%
Wellesley	60,393	50,619	83.8%	9,774	16.2%
Woolwich	77,169	51,079	66.2%	26,090	33.8%

Source: Statistics Canada, 2001.

2.4.3 Farmland Use

Farmland in Waterloo Region is used predominantly for crop production. In 2001, 80% of the total farmland base was used for crop production (Figure 2.1). A small percentage of farmland was reported as pasture lands while just over 10% of the farmland base was used for other purposes (i.e. Christmas tree production, farm woodlots, land occupied by farm buildings/yards etc.).

Figure 2.1 Farmland Use in Ontario and Waterloo Region, 2001



Source: Statistics Canada, 2001.

Of the 180,000 acres of cropland reported in 2001, Woolwich reported 64,000 acres in crops or 35.5% of the total for Waterloo Region (Table 2.3). Wellesley and Wilmot each reported 25% of the regional total area in crops. Each of the six municipalities in Waterloo Region reported a decline in the total area of land in crops between 1996 and 2001.

Table 2.3 Farmland Use in Ontario and Waterloo Region, 1996, 2001

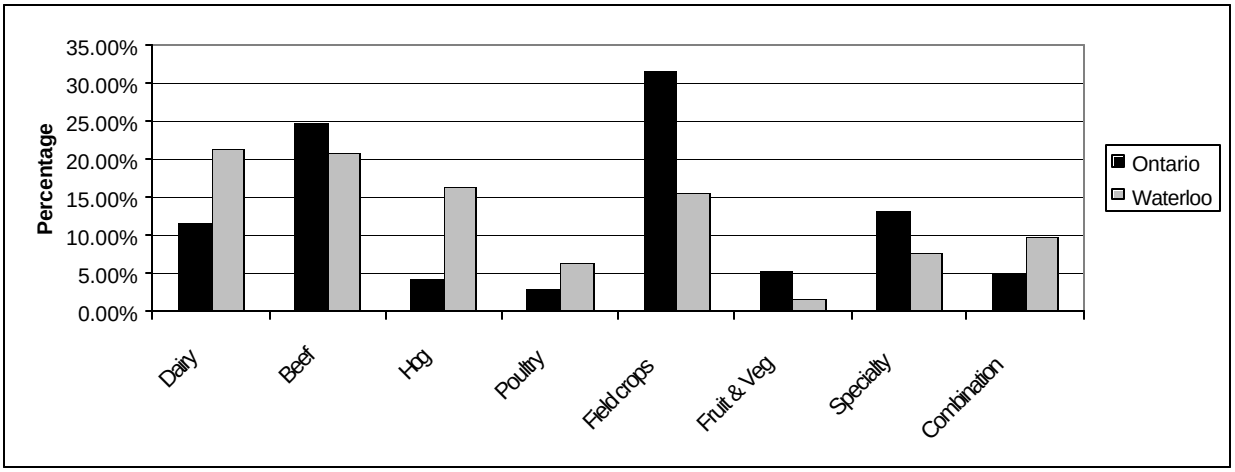
	Total area of farms (Acres)	Land in crops	Summerfallow	Tame or seeded pasture	Natural land for pasture	All other land (including Christmas tree area)
2001						
Ontario	13,507,357	9,035,915	35,175	773,650	1,314,335	2,348,282
Waterloo Region	225,800	180,274	822	9,344	8,402	26,958
North Dumfries	25,069	18,585	n/a	1,386	1,246	n/a
Cambridge	5,001	3,933	n/a	108	191	n/a
Kitchener	4,329	3,693	n/a	60	67	n/a
Wilmot	53,839	44,770	176	1,626	1,363	5,904
Wellesley	60,393	45,286	54	4,257	3,576	7,220
Woolwich	77,169	64,007	525	1,907	1,959	8,771
1996						
Ontario	13,879,565	8,759,707	48,492	860,786	1,641,692	2,568,888
Waterloo Region	234,406	182,881	506	10,409	11,487	29,123
North Dumfries	28,706	21,690	n/a	1,714	1,793	n/a
Cambridge	5,816	4,316	0	131	390	979
Kitchener	5,638	3,869	0	167	437	1,165
Wilmot	52,784	42,509	47	1,872	2,005	6,351
Wellesley	61,867	45,595	n/a	4,777	4,369	n/a
Woolwich	79,595	64,902	n/a	1,748	2,493	n/a

Source: Statistics Canada, 1996, 2001.

2.4.4 Farm Types

As indicated in the 2001 Census of Agriculture, Waterloo Region is home to a variety of farm types.[5] Dairy and beef are the most common type, each accounting for 21% of all farms in 2001. Hog farms represent the next largest share of farms at 16% followed by field crop farms at 15%. Approximately, 66% of all farms in Waterloo Region are primarily involved in livestock production compared to 45% in Ontario (Figure 2.2).

Figure 2.2 Farm Types in Ontario and Waterloo Region, 2001



Source: Statistics Canada, 2001.

Between 1996 and 2001, the number of Dairy farms in Waterloo Region increased from 256 farms to 296 farms, which represents an increase of 15.6% (Table 2.4). During the same period the province as a whole experienced a 23% decline in dairy farms. The increase in Waterloo Region was restricted to Wellesley and Woolwich which together account for 77.7% of all dairy farms. The four other municipalities all experienced a decline in dairy farms between 1996 and 2001.

The province as whole experienced a steady decline in Dairy farm numbers between 1991 and 2001 while Waterloo Region experienced a decline between 1991-96 and an increase between 1996-2001. Part of the recent increase may be explained by the way Statistics Canada categorizes farms based on the product or group of products that make up the majority of the estimated total receipts. Accordingly, a farm could be classified differently in subsequent census years depending on which production activity

[5] Farm typing is a procedure that classifies each census farm according to the predominant type of production. This is done by estimating the potential receipts from the inventories of crops and livestock reported on the questionnaire and determining the product or group of products that make up the majority of the estimated receipts. For example, a census farm with total potential receipts of 60% from hogs, 20% from beef cattle and 20% from wheat, would be classified as a hog farm. Farm type is based on farms reporting total gross farm receipts of $2,500 or more. Field Crop farms include wheat, grain, oilseed and other field crops. Miscellaneous Specialty farms includes greenhouse flower and plant production, bulbs, shrubs, trees, sod, ornamentals, mushroom houses, honey production, maple syrup production, deer, mink, etc.

generated the majority of sales. Growth in the Dairy sector could also be the result of farm conversions from other sectors such as beef and/or hog production.

The number of Beef farms in Waterloo Region remained consistent between 1996 and 2001 at 289 farms despite a decline in beef farms in North Dumfries, Cambridge, Kitchener, and Wilmot. During this period Wellesley and Woolwich reported a combined increase of 40 Beef farms (Table 2.4). It's suspected that these businesses are small scale operations as no new major beef operations have been observed in Waterloo Region in recent years (personal communication, Jeff Stager, May 27, 2003).

In 2001, Waterloo Region reported 226 Hog farms, down from 259 farms in 1996 (Table 2.4). Most of the decline occurred in Wilmot and Woolwich where there was a combined loss of 25 farms. The number of Poultry farms in Waterloo Region remained relatively stable between 1996 and 2001.

Some of the loss reported in the Hog sector is likely associated with consolidation in the industry (personal communication, Jeff Stager, May 27, 2003). In an attempt to increase efficiencies and in response to the cost price squeeze, farmers are finding that net returns per unit of production are decreasing. In Ontario, this trend is resulting in fewer but larger, more specialized farms (Caldwell, 2001. p.2).

Field Crop type farms (i.e. wheat, grain and oilseed) in Waterloo Region increased by 22.7% between 1996 and 2001 for a total of 216 farms. During the same period the overall growth in this sector at the provincial level remained almost unchanged (Table 2.4). Most of the increase in Field Crop type farms was associated with oilseed type crops such as soybeans. This is consistent with provincial trends where the area of farmland in soybeans is continuing to increase. North Dumfries, Wilmot, Wellesley and Woolwich all reported increases in Field Crop type farms during this period.

Waterloo Region reported eight Fruit farms and fifteen Vegetable farms in 2001 (Table 2.4).[6] Between 1996 and 2001 the number of Fruit farms declined by 27% (3 farms) while Vegetable farms increased by 15% (2 farms). The increase in Vegetable farms occurred in Wilmot and Wellesley, which offset losses in this sector in each of the other four municipalities.

There was a notable decline in Miscellaneous Specialty farms in Waterloo Region between 1996 and 2001. This is consistent with the provincial trend which saw significant growth in this sector between 1991-96 (16.9%) and a subsequent decline back to 1991 levels by 2001. A wide range of production activities are associated with this sector including greenhouse flower and plant production, bulbs, shrubs, trees, sod,

[6] It is important to emphasize that the total number farms producing vegetables and fruit in Waterloo Region is larger than the figure presented here. As noted earlier, Statistics Canada categorizes farms based on the product or group of products that make up the majority of the estimated farm receipts. Waterloo Region features a number of farms that are primarily engaged in livestock or grain production and are also involved in some vegetable and fruit production. A more detailed overview of vegetable and fruit production in Waterloo Region is presented in Section 2.4.7 and 2.4.8 of this report.

ornamentals, mushroom houses, honey production, maple syrup production, deer, mink, etc. Specialty type farms declined by 21% with losses reported in each of the six municipalities (Table 2.4).

The overview of farm types presented above does not fully illustrate the degree to which farm operators are involved in mixed farming activities. Indeed, while many farms in Waterloo Region specialize in one or two products, there are a substantial number of farms that produce a wide variety of products. In 2001, 136 farms or 10% of the total farms in the region were reported as combination type farms (Table 2.4).

Map 2.2 provides a graphic overview of the different farm types at the municipal level with comparisons to Waterloo Region as whole and the province of Ontario.

The Census of Agriculture began to collect data on organic farming activity in 2001. In order to achieve organic status, a farm must follow strict organic practices. All producers selling organic foods must maintain a record of production and handling.

Canada recently adopted a national code of practice that defines and regulates the use of the terms "organic", "organically grown", "organically raised", "certified organic" and other variations. Independent, organic certification agencies verify growing, processing, packaging, transportation, warehousing and retailing procedures. While these standards are not regulated by any government department, the Food and Drug Act requires labels to be true and factual

A total of 21 farms in Waterloo Region reported producing certified organic products. Almost all of these farms are located in Wellesley (14 farms) and Wilmot (6 farms). Field crops represent the most common type of certified organic product being produced in Waterloo Region (Table 2.5).

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Table 2.4 Number of Farms by Farm Type, 1996 and 2001

	Total # of farms	Dairy	Beef	Hog	Poultry	Field Crops	Fruit	Veg.	Misc. Spec.	Livestock Comb.	Other Comb.
2001											
Ontario	55,092	6,414	13,669	2,454	1,609	17,789	1,733	1,233	7,301	1,617	1,273
Waterloo Region	1,382	296	289	226	91	216	8	15	105	110	26
North Dumfries	103	15	23	2	10	35	0	1	13	3	1
Cambridge	29	2	6	1	3	8	1	1	3	2	2
Kitchener	27	3	3	0	0	7	1	1	7	2	3
Wilmot	252	46	40	19	25	72	1	6	26	13	4
Wellesley	494	95	125	147	19	31	0	4	21	44	8
Woolwich	477	135	92	57	34	63	5	2	35	46	8
1996											
Ontario	59,887	8,320	14,172	2,677	1,686	17,681	2,016	1,428	8,547	2,030	1,330
Waterloo Region	1,494	256	289	259	88	176	11	13	133	240	29
North Dumfries	121	18	34	8	9	24	1	4	18	2	3
Cambridge	38	2	8	1	3	9	0	2	5	4	4
Kitchener	37	4	5	1	0	9	2	2	8	3	3
Wilmot	285	57	65	31	30	45	2	1	35	11	8
Wellesley	501	73	90	148	17	21	0	1	24	121	6
Woolwich	512	102	87	70	29	68	6	3	43	99	5

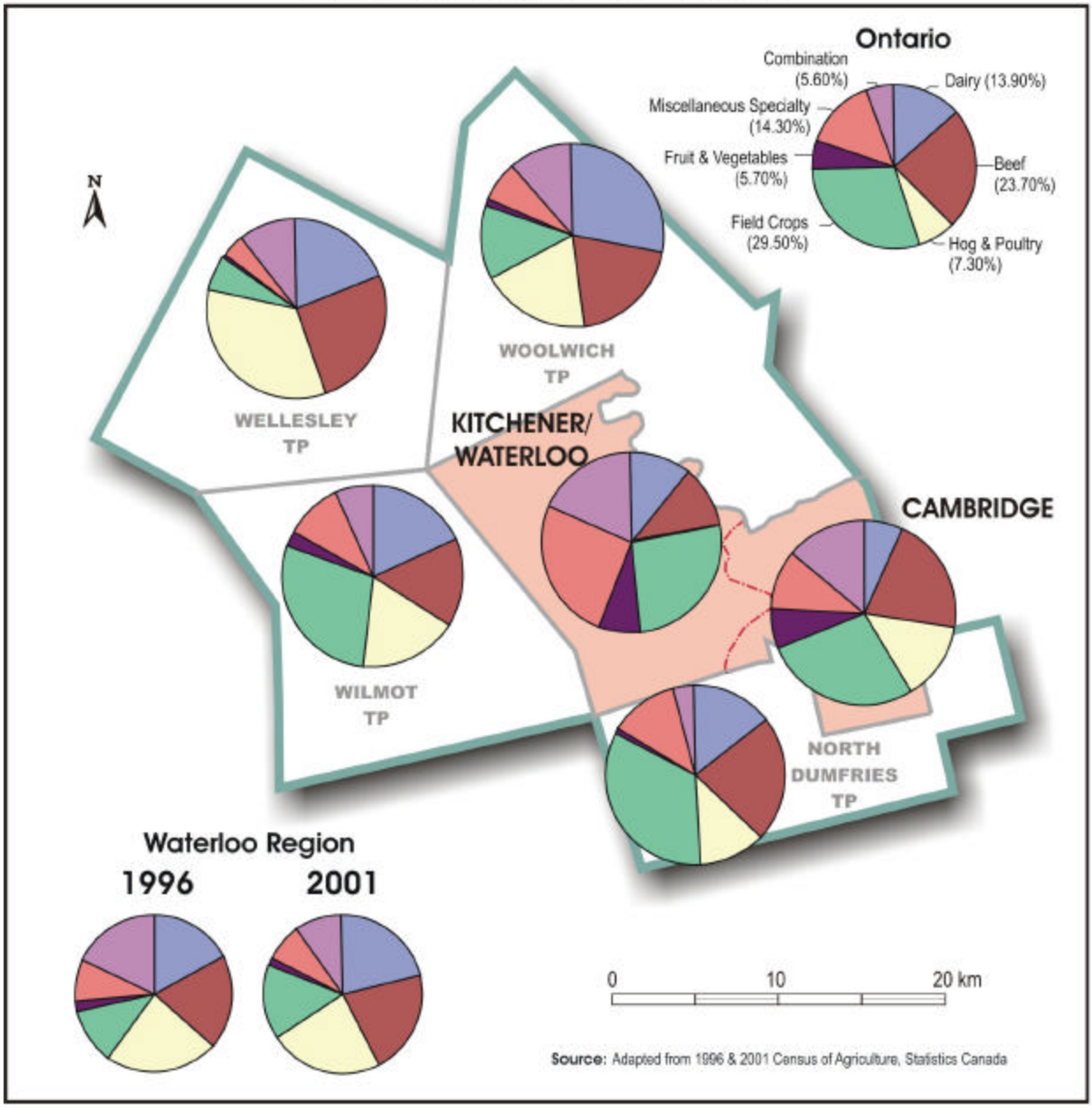
Source: Statistics Canada, 1996, 2001.

Table 2.5 Number of Farms Producing Certified Organic Products, 2001

	Total number of farms	Fruits, vegetables or greenhouse products	Field crops (grains, oilseeds, etc.)	Animals or animal products (meat, milk, eggs, etc.)	Other (maple syrup, herbs, etc.)
Ontario	405	120	308	120	38
Waterloo Region	21	5	19	5	1
North Dumfries	0	0	0	0	0
Cambridge	1	0	1	1	0
Kitchener	0	0	0	0	0
Wilmot	6	2	6	1	0
Wellesley	14	3	12	3	1
Woolwich	0	0	0	0	0

Source: Statistics Canada, 2001.

Map 2.2
Waterloo Region
Farm Types by Municipality, 2001
(Farms with annual gross farm receipts of $2,500 or more)



The pie charts illustrate the proportion of different farm types in each of the municipalities. The farm type categories are identified in the Ontario profile. Waterloo Region as a whole is profiled for 1996 and 2001.

A further assessment of farm type specialization in Waterloo Region can be obtained using the Location Quotient. Economic analysts have found the Location Quotient (LQ) to be a useful tool in determining which sectors of the economy are more specialized than others (Bendavid-Val, 1991, p.73). The term 'specialized' in this instance refers to the relative size or presence of an industrial activity. The LQ is essentially a ratio of ratios. In assessing farm type specialization, the regional share of a particular farm sector or type is compared to the provincial share in the sector. The LQ can be used to gauge the relative specialization of a region in various farm sectors such as dairy, beef and field crops. Using the dairy sector as an example, the LQ formula appears as follows:

$$LQ = \frac{\text{number of dairy farms in the region}}{\text{total number of farms in the region}} \div \frac{\text{number of dairy farms in the province}}{\text{total number of farms in the province}}$$

$$LQ = (296 / 1{,}382) \div (6{,}416 / 55{,}092) = 1.8$$

The LQ has a base value of one. An LQ of one suggests that the region and the province are specialized to an equal degree in the chosen industry sector. If the LQ is greater than one, it indicates that the region has a higher degree of specialization in the industry sector than the province. An LQ of less than one indicates that the industry sector is less specialized in the region than it is for the province.

Using the farm type data from Table 2.4, the 2001 LQ for the dairy sector indicates that Waterloo Region is specialized in dairy production. The LQ's for the other farm sectors are presented in Table 2.6. The LQ data suggests that Waterloo Region is also more specialized in hog, poultry, and mixed livestock farms. The high degree of mixed livestock farming in Waterloo Region is consistent with Mennonite farming practices. Waterloo Region experienced a notable increase in dairy specialization between 1996 and 2001, while specialization in mixed livestock farms appeared to drop off. However, as noted earlier in the report, this observation is likely associated with differences in the way farm operations were reported between the two census periods.

Based on the LQ data, Waterloo Region is less specialized in field crop, fruit, vegetable and specialty type farms.

Table 2.6 Location Quotient for Farm Types for Waterloo Region, 1996 and 2001

Year	Dairy	Beef	Hog	Poultry	Field Crops	Fruit	Veg.	Misc. Spec.	Livestock Comb.	Other Comb.
2001	1.8	0.8	3.7	2.3	0.5	0.2	0.5	0.6	2.7	0.8
1996	1.2	0.8	3.9	2.1	0.4	0.2	0.4	0.6	4.7	0.9

Source: Adapted from Statistics Canada, 1996, 2001.

2.4.5 Livestock and Animal Products

In 2001, Waterloo Region reported a total of 98,443 cattle and calves, which represents 4.6% of the provincial total (Table 2.7). Waterloo Region also reported substantial livestock numbers in both the hog and poultry sectors. In 2001, Waterloo Region reported a total of 156,612 pigs, 260,235 turkeys and 2.8 million hens and chicks.

Table 2.7 Inventory of Selected Farm Related Animals including Livestock, Poultry, Bee Colonies, etc., 2001

	Ontario	Waterloo Region	% of provincial total
Total cattle and calves	2,140,731	98,443	4.6%
Total dairy cows	363,544	14,566	4.0%
Total sheep and lambs	337,625	4,329	1.3%
Total pigs	3,457,346	156,612	4.5%
Total turkeys	3,402,697	260,235	7.7%
Total hens and chicks	43,624,696	2,826,109	6.5%
Total goats	62,310	1,363	2.2%
Total horses and ponies	83,337	3,923	4.7%
Total deer [a]	14,464	34	0.2%
Total llamas and alpacas	2,544	47	1.8%
Total bee colonies	56,740	661	1.2%
Total mink	351,226	32,760	9.3%

a Excluding wild deer
Source: Statistics Canada, 2001.

There are close to 4,000 horses and ponies in Waterloo Region which represents approximately 5% of the total horses and ponies in Ontario. Just over half of the horses and ponies in Waterloo Region are located in Wellesley and approximately one third are located in Woolwich. The concentration of horses in these areas is closely associated with the large Mennonite farm population.

Waterloo Region features a significant dairy sector. In 2001, Waterloo Region reported a total of 107.9 million litres in milk shipments to milk processing plants, which represents 4.2% of the provincial production. Milk shipments from Waterloo Region increased by 5% between 2000 and 2001. Waterloo Region is the sixth largest county/region in Ontario in terms of milk production (Dairy Farmers of Ontario, 2001).

Total production of broilers, roasters and Cornish production in Waterloo Region amounted to 20 million kilograms 2001, which represents 6% of the provincial production.

2.4.6 Field Crops

Waterloo Region produces a variety of grain and oilseed crops including wheat, grain corn and soybeans. The largest field crop grown in Waterloo Region in terms of acreage is corn. In 2001, 638 farms reported 46,751 acres of grain corn and 731 farms

reported 20,541 acres of silage corn (Table 2.8). Alfalfa and alfalfa mixtures is the second largest field crop in Waterloo Region at 39,690 total acres. Close to 70% of the farms in Waterloo Region reporting growing alfalfa and alfalfa mixtures in 2001. As noted earlier, 60% of all farms in Waterloo Region are primarily involved in livestock production which is supported by the large areas of farmland in fodder crops.

Soybeans are also grown in significant quantity in Waterloo Region. In 2001, 335 farms reported growing a total of 26,997 acres of soybeans. Other oilseeds grown in Waterloo Region include flaxseed, canola, white beans and sunflowers.

Wheat continues to be an important crop for many farm operations. In 2001, 427 farms in Waterloo Region reported growing a total of 13,132 acres of wheat, most of which was winter wheat. A substantial number of farms reported growing barley in Waterloo Region with a total of 6,000 acres in 2001. Waterloo Region also reported 360 acres of potatoes from 36 farms.

Table 2.8 Number of Farms and Acreage of Selected Field Crops, 2001

Field Crops	Ontario		Waterloo Region	
	Number of farms	Acres	Number of farms	Acres
Wheat	11,565	670,857	427	13,132
Oats	4,550	101,670	55	1,411
Barley	7,498	308,728	234	5,999
Buckwheat	287	5,941	4	36
Rye	1,430	68,332	24	241
Mixed grains	7,063	218,265	556	15,381
Corn for grain	19,244	2,003,025	638	46,751
Corn for silage	9,365	319,364	731	20,541
Alfalfa and alfalfa mixtures	26,166	1,610,809	992	39,691
Canola	432	36,439	5	n/a
Flaxseed	48	1,983	1	n/a
Soybeans	19,706	2,248,466	335	26,997
Dry white beans	987	58,559	18	1,114
Other dry beans	653	63,061	8	442
Sunflowers	76	1,109	2	n/a
Potatoes	876	43,396	36	360

Source: Statistics Canada, 2001.

2.4.7 Fruits

Waterloo Region produces a variety of fruits and berries including apples, pears, plums, cherries, blueberries, raspberries, strawberries, and cranberries. The total area of fruit and berry production in Waterloo Region amounted to 328 acres in 2001 (Table 2.9). Apples account for the largest percentage of this area at 170 acres. In 2001, marketed production of apples grown in Waterloo Region amounted to 2.4 million pounds with a farm value of $443,000 (Ontario Ministry of Agriculture and Food, 2001).

A considerable amount of acreage was also reported for Strawberry production at 103 acres. In 2001, marketed production of strawberries grown in Waterloo Region amounted to 338,000 pounds with a farm value of $362,000 (Ontario Ministry of Agriculture and Food, 2001).

Table 2.9 Number of Farms and Acreage of Selected Fruit and Berry Production, 2001

	Ontario		Waterloo Region	
	Number of farms	Total acres in production	Number of farms	Total acres in production
Total producing area of fruits and berries	3,238	57,217	120	328
Apples	1,412	22,204	88	170
Blueberries	158	519	4	23
Cherries (sweet)	354	869	9	3
Cherries (sour)	195	1,732	9	4
Cranberries	12	112	2	n/a
Pears	695	2,668	20	10
Plums and prunes	472	1,130	10	3
Raspberries	683	1,147	18	18
Strawberries	830	5,002	23	103

Source: Statistics Canada, 2001

2.4.8 Vegetables

Waterloo Region produces a variety of field grown and greenhouse grown vegetables. The total area of field grown vegetable production in Waterloo Region amounted to 643 acres in 2001 (Table 2.10). Sweet Corn accounted for the largest single share of this area at 233 acres. In 2001, marketed production of sweet corn grown in Waterloo Region amounted to 945,000 pounds with a farm value of $181,000 (Ontario Ministry of Agriculture and Food, 2001).

A considerable amount of acreage was also reported for Squash, Pumpkin and Zucchini production at 118 acres.

Greenhouse vegetable production was reported on 21 farms in Waterloo Region in 2001 and mushroom production was reported on one farm. Greenhouse vegetable production is mostly located in Wellesley and Woolwich (Table 2.11).

Table 2.10 Number of Farms and Acreage of Selected Vegetable Production, 2001

	Ontario		Waterloo Region	
	Number of farms	Acres	Number of farms	Acres
Total vegetables	3,938	170,147	78	643
Asparagus	309	2,255	11	49
Beets	509	861	11	6
Broccoli	365	2,860	4	n/a
Cabbage	461	4,137	7	n/a
Carrots	554	8,872	7	28
Cauliflower	359	3,195	4	4
Cucumbers	930	8,374	10	n/a
Dry onions	574	6,624	12	28
Green or wax beans	760	13,035	12	19
Green peas	723	23,308	9	15
Lettuces	343	1,033	4	n/a
Peppers	697	4,112	6	n/a
Radishes	195	625	5	2
Rhubarb	183	215	7	1
Rutabagas and turnips	177	2,036	1	n/a
Shallots, green and seed onions	226	564	2	n/a
Spinaches	215	898	4	n/a
Squash, pumpkins and zucchini	1,238	7,765	31	118
Sweet corn	1,503	49,019	44	233
Tomatoes	1,286	21,201	14	11
Other vegetables	985	5,716	22	35

Source: Statistics Canada, 2001

Table 2.11 Number of Farms and Area in Greenhouse Vegetable and Mushroom Production, 2001

	Greenhouse vegetables		Mushrooms	
	Farms reporting	Square feet	Farms reporting	Square feet
Ontario	681	47,727,506	76	3,016,020
Waterloo Region	21	n/a	1	n/a
North Dumfries	0	0	0	0
Cambridge	0	0	0	0
Kitchener	0	0	0	0
Wilmot	1	n/a	1	n/a
Wellesley	9	8,911	0	0
Woolwich	11	n/a	0	0

Source: Statistics Canada, 2001

2.4.9 Maple Syrup, Sod, and Nursery and Other Forest Products

One of the more substantial specialty farm products produced in Waterloo Region is maple syrup. In 2001, 284 farms in Waterloo Region reported a total of 151,130 taps on maple trees or 11.6% of the provincial total. Maple syrup production is concentrated in

Woolwich and Wellesley which account for 95% of all maple tree taps in Waterloo Region (Table 2.12).

Waterloo Region has a number of farm operations involved in nursery, Christmas tree and sod production. In 2001, Waterloo Region reported 16 farms primarily engaged in Nursery production,[7] 3 farms involved in sod production and 13 farms involved in Christmas tree production (Table 2.12).

Farm woodlots represent another important source of income for many farmers in Waterloo Region. In 2001, total sales of forest products from Waterloo Region farms amounted to close to $1 million (Table 2.13).

Table 2.12 Number of Farms and Production Area Associated with Nursery Products, Sod Production, Christmas Tree Production and Taps on Trees for Maple Syrup Production, 2001

	Nursery products		Sod production		Christmas tree production		Taps on maple trees	
	Farms reporting	Acres	Farms reporting	Acres	Farms reporting	Acres	Farms reporting	# of taps
Ontario	1,443	25,488	135	28,674	918	21,766	2,588	1,304,995
Waterloo Region	16	150	3	n/a	13	155	284	151,130
North Dumfries	2	n/a	0	0	1	n/a	4	1,337
Cambridge	0	0	1	n/a	1	n/a	2	n/a
Kitchener	2	n/a	0	0	1	n/a	1	n/a
Wilmot	6	12	0	0	5	41	16	5,572
Wellesley	0	0	0	0	1	n/a	124	64,192
Woolwich	6	111	2	n/a	4	88	137	79,657

Source: Statistics Canada, 2001

2.4.10 Farm Productivity: Total Farm Receipts, Farm Operating Expenses and Net Revenue

Waterloo Region reported $379.6 million in total gross farm receipts in 2000 compared to $301.3 million in 1995 (Table 2.13). Waterloo Region's total farm receipts for 2000 represent 4.16% of the provincial total. Growth in the dairy and field crop sectors since the mid 1990's has been a major factor in the increase. With an additional 40 dairy farms between 1995 and 2001, the volume of milk produced annually in Waterloo Region increased by 21% from 89 million litres to almost 108 million litres (Dairy Farmers of Ontario, 2001). During the same period, the area of farmland in soybean production increased 20% from 22,400 acres to 27,000 acres (Statistics Canada, 1996 and 2001).

Within Waterloo Region, Woolwich reported the largest share of total gross farm receipts at $117.5 million (30.9%) followed by Wilmot at $98.4 million (25.9%) and Wellesley at $92.9 million (24.4%). Several factors account for Woolwich having the

[7] Nursery production includes establishments primarily engaged in growing nursery products, nursery stock, shrubbery, bulbs, fruit stock, vines, ornamentals, etc., in open fields.

highest total farm receipts. It has the largest percentage of the total farmland area in Waterloo Region at 77,000 acres and it has strong representation in the supply managed sectors which typically generate higher and more stable farm incomes.[8] In 2001, 45% of all dairy farms and 37% of all poultry farms in Waterloo Region were located in Woolwich.

The remaining three municipalities accounted for 19% of Waterloo Region's total gross farm receipts in 2000: North Dumfries ($47.7 million), Cambridge ($13.5 million), Kitchener ($9.3 million). These areas had considerably fewer farms than the other municipalities and accounted for 15% of the total farmland area in Waterloo Region.

Each of the individual municipalities outperformed the province in terms of total farm receipts on a per acre basis. As shown in Map 2.3, farm receipts per acre in Wellesley ($1,539) and Woolwich ($1,523) were slightly more than twice the provincial average of $675/acre. In Wilmot ($1,828), North Dumfries ($1,905), and Kitchener-Waterloo ($2,164) farm receipts per acre were close to three times the provincial average and in Cambridge ($2,708) they were reported at four times the provincial average. The concentration of livestock and poultry farms in Waterloo Region is a major contributing factor to the higher level of receipts per acre relative to the provincial average. The high figures reported in Cambridge and Kitchener relate to the fact that these municipalities account for a small portion of the total farmland area in Waterloo Region while supporting a mixture of dairy, beef, hog and poultry farms.

[8] Supply management is a system used by certain agricultural commodity groups to ensure a stable supply of products. The system also promotes stable farm incomes. The producers control the amount of product they produce, and pay a fee (a levy) on all their production to fund the administration and marketing expenses of their provincial commodity boards and national agency. Milk, poultry and egg production all use supply management controls to regulate domestic production (National Farm Products Council, May 2003).

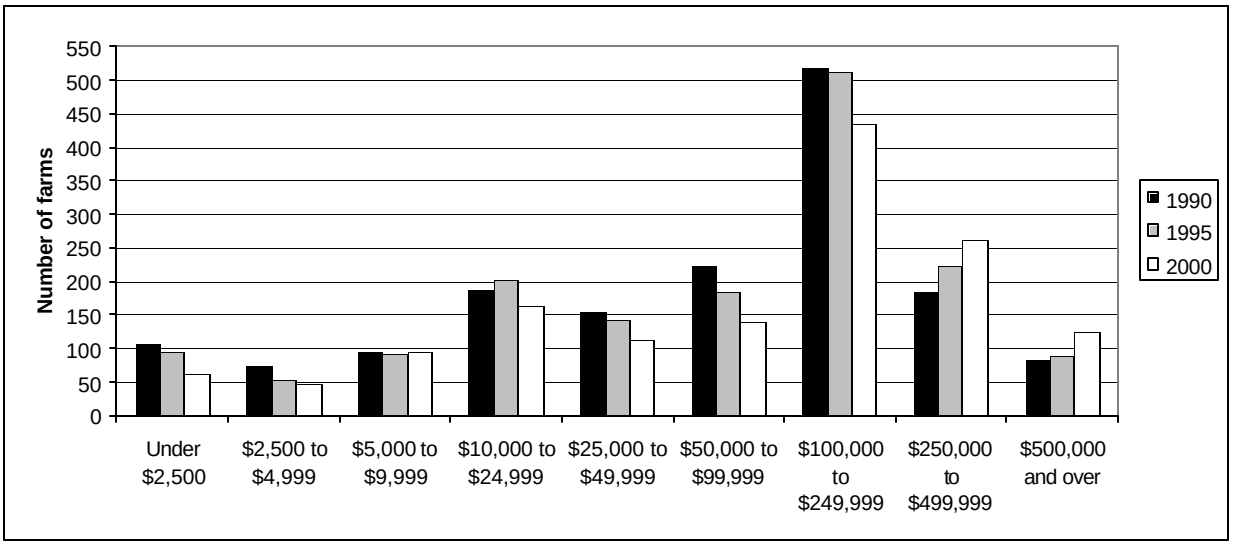
Table 2.13 Total Gross Farm Receipts, Farm Operating Expenses, Net Revenue and Forest Product Sales, 1995 and 2000

	Number of farms	Total gross farm receipts	Total farm expenses	Total Net Revenue	Net Revenue per farm	Sales of forest products	
						Number of farms	Amount
2000							
Ontario	59,728	$9,115,454,790	$7,829,246,574	$1,286,208,216	$21,534	2,903	$20,587,058
Waterloo Region	1,444	$379,601,661	$322,890,373	$56,711,288	$39,274	192	$954,650
North Dumfries	117	$47,765,239	$41,834,174	$5,931,065	$50,693	5	n/a
Cambridge	32	$13,542,914	$12,392,497	$1,150,417	$35,951	0	$0
Kitchener	29	$9,368,485	$7,327,092	$2,041,393	$70,393	1	n/a
Wilmot	271	$98,410,670	$83,106,130	$15,304,540	$56,474	10	$118,031
Wellesley	501	$92,972,525	$80,408,733	$12,563,792	$25,077	88	$453,051
Woolwich	494	$117,541,828	$97,821,747	$19,720,081	$39,919	88	$289,628
1995							
Ontario	67,520	$7,778,476,483	$6,545,516,325	$1,232,960,158	$18,261	3,343	$19,717,541
Waterloo Region	1,590	$301,384,956	$252,143,222	$49,241,734	$30,970	192	$786,496
North Dumfries	134	$22,595,761	$17,778,324	$4,817,437	$35,951	7	$109,514
Cambridge	42	$25,345,208	n/a	n/a	n/a	2	n/a
Kitchener	43	$8,121,911	n/a	n/a	n/a	7	n/a
Wilmot	307	$60,965,398	$52,756,175	$8,209,223	$26,740	22	$100,392
Wellesley	522	$84,494,795	$70,411,680	$14,083,115	$26,979	67	$147,275
Woolwich	542	$99,861,883	$79,691,231	$20,170,652	$37,215	87	$397,694

Source: Statistics Canada, 1996, 2001.

Approximately 57% of the farms (822) in Waterloo Region reported gross farm receipts of $100,000 or more in 2000. Between 1990 and 2000 the number of farms reporting less than $100,000 in gross farm receipts declined by 25% while the number of farms reporting $100,000 or more increased by 5% (Figure 2.3). This trend is tied to a combination of factors including a provincial trend wherein smaller farms are being consolidated into larger farms, and a more localized trend where Waterloo Region has experienced growth in the number of dairy and poultry farms.

Figure 2.3 Distribution of Farms in Waterloo Region by Total Gross Receipts Category, 1990-2000



Source: Statistics Canada, 1991, 1996, 2001.

Total farm operating expenses in Waterloo Region amounted to $322.8 million in 2000 (Table 2.13). The concentration of livestock and poultry type farms in Waterloo Region factors heavily into the distribution of expenses. Close to 60% of total operating expenses ($188.4 million) in Waterloo Region are tied to livestock and poultry related expenses including feed purchases, livestock and poultry purchases, and veterinary services (Table 2.14). In contrast, livestock related expenses at the provincial level account for just over 30% of total farm operating expenses (Figure 2.4). Wages and salaries paid to family members and other persons is the next largest single expense category in Waterloo Region at 9% of total operating expenses ($30 million). As shown in Figure 2.5, livestock expenses increased by $37 million between 1995 and 2000 while wage expenses increased by $13 million.

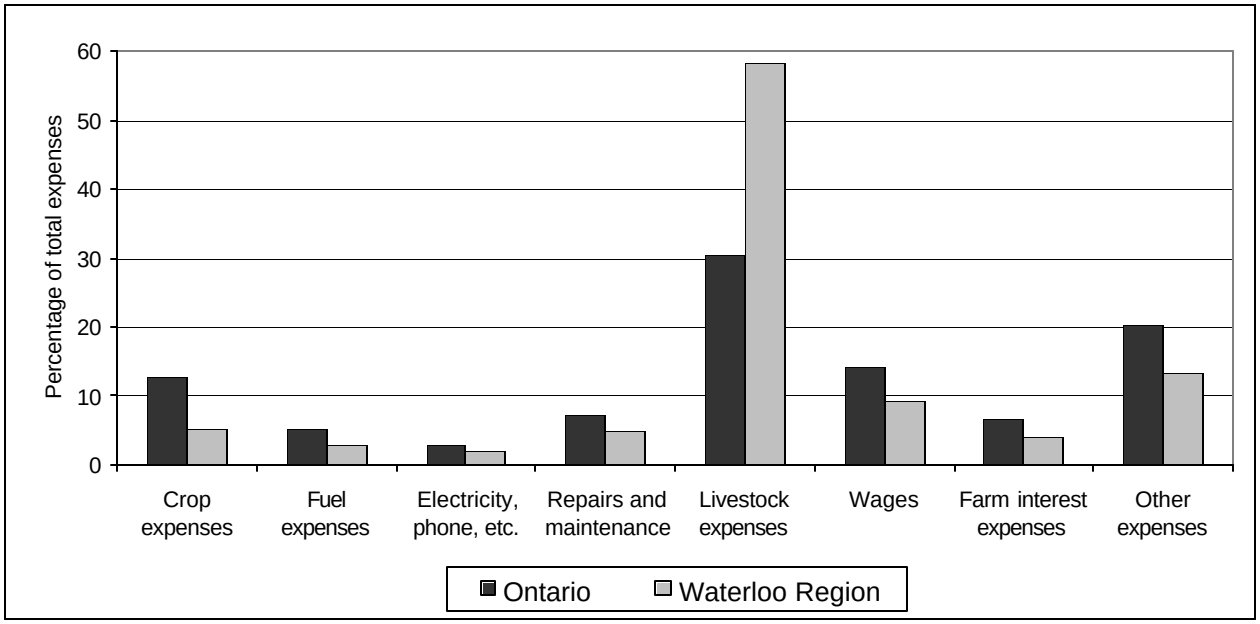
In 2000, net revenue per farm in Waterloo Region amounted to $39,274 compared to the provincial average of $21,534 per farm. Each of the six municipalities in Waterloo Region reported higher net revenue per farm averages than the province. Once again, the concentration of livestock and poultry farms in Waterloo Region has to be recognized as the major factor behind this result. Kitchener reported the highest average net farm revenue in 2000 at $70,393 per farm followed by Wilmot and North Dumfries at $56,474 and $50,696 respectively.

Table 2.14 Farm Operating Expenses by Expense Category, 2000 ($ '000)

	Total crop expenses [a]	All fuel expenses	Electricity, telephone, etc.	Equipment and building repairs and maintenance	Total livestock expenses [b]	Total wages	Farm interest expenses	Other expenses [c]
Ontario	$1,001,112	$417,469	$224,100	$563,816	$2,396,942	$1,118,177	$523,219	$1,584,407
Waterloo Region	$16,964	$9,335	$6,250	$16,277	$188,461	$30,062	$12,975	$42,561
North Dumfries	$1,816	$1,023	$910	$1,680	$17,203	$8,541	$854	$9,802
Cambridge	$252	$182	n/a	$362	$3,511	$501	$88	n/a
Kitchener	$945	$352	n/a	$338	$1,440	$1,080	$263	n/a
Wilmot	$3,949	$2,293	$1,964	$4,226	$50,416	$7,841	$3,708	$8,705
Wellesley	$3,040	$2,320	$1,147	$3,888	$58,175	$1,928	$3,129	$6,779
Woolwich	$6,716	$3,163	$1,937	$5,779	$51,631	$10,170	$4,931	$13,491

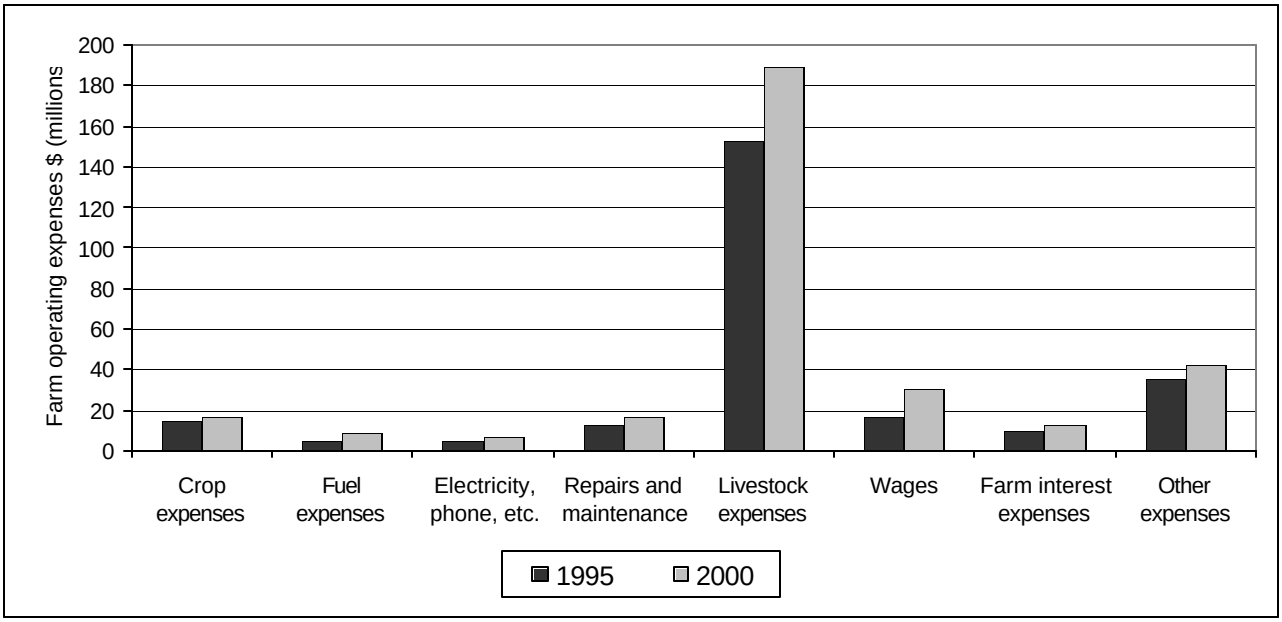
[a] Crop expenses include fertilizer and lime, seed and plant purchases, herbicides, pesticides, etc.
[b] Livestock expenses include feed purchases, livestock and poultry purchases, veterinary services, etc.
[c] Other expenses includes rent or leasing expenses for land and buildings, custom work and contract work, and other expenses.
Source: Statistics Canada, 2001.

Figure 2.4 Distribution of Farms in Waterloo Region and Ontario by Farm Operating Expense Category, 2000



Source: Statistics Canada, 2001.

Figure 2.5 Distribution of Farms in Waterloo Region by Farm Operating Expense Category, 1995-2000



Source: Statistics Canada, 1996, 2001.

2.4.11 Value Added

Value added is the difference between a good's final value and the value of the other items that went into producing it. One way to calculate value added in agriculture is to take the gross farm receipts and subtract operating expenses (except wages, interest, rent and property taxes) (Wolfe, Statistics Canada 1999). Total gross margin (the profit) is also included in value added. Total gross margin is the gross farm receipts minus operating expenses. These last items are not subtracted because they represent the value of labour and capital added to the original "inputs" into the commodity.

Each step in the value-added chain uses capital and labour to create employment. Consequently, the more "value" that is added to a product before final sale or export, the better it is for the economy, provided, of course, that demand is there. Adding value to a product is often translated into job creation and is viewed as essential to a flourishing economy.

Farming in Waterloo Region produces a wide variety of goods such as grain, livestock, dairy products, fruit and vegetables. Because labour and other agricultural and non-agricultural goods such as seed, forage, fertilizer and technology are required to produce these goods, farming makes a considerable contribution to Waterloo Region's total value added.

As shown in Table 2.15, the total value added component for agriculture in Waterloo Region amounted to $130.5 million in 2000. This translates into 34 cents of value added per dollar of gross farm receipts.

Table 2.15 Value Added Agriculture in Waterloo Region, 2000

	Total Farm Receipts	Total Farm Operating Expenses [a]	Total Agriculture Value Added [b]
Ontario	$9,115,454,790	$5,027,773,660	$4,087,681,130
Waterloo Region	$379,601,661	$249,075,368	$130,526,293
North Dumfries	$47,765,239	$23,431,928	$24,333,311
Cambridge	$13,542,914	$11,203,750	$2,339,164
Kitchener	$9,368,485	$5,174,659	$4,193,826
Wilmot	$98,410,670	$64,849,016	$33,561,654
Wellesley	$92,972,525	$71,485,059	$21,487,466
Woolwich	$117,541,828	$72,930,956	$44,610,872

[a] Total farm operating expenses excluding wages, interest, rent and property taxes.
[b] Total Agriculture value added = (Total farm receipts – Total farm operating expenses excluding wages, interest, rent and property taxes).
Adapted from Statistics Canada, 2001.

The measure of value added can differ depending on the farm type. With an average 60 cents of value added per dollar of gross farm receipts, tobacco farms have the highest share (i.e. they use the most labour and capital but fewer inputs) among all farm types, while beef farms rank last (21 cents) (Wolfe, Statistics Canada 1999). When comparing the value added for every dollar in gross farm receipts between beef farms and dairy farms for example, the value-added figures are very different. Producing cattle for slaughter usually requires less capital and labour. In contrast, dairy farms are far more labour and capital (equipment and machinery) intensive. On dairy farms, labour and expensive milking equipment are essential. Another major difference between beef and dairy operations is that beef operations work in an open market, whereas dairy operators work within a supply management system which controls production and price levels.

As shown earlier in this report, Dairy farms account for approximately 20% of all farms in Waterloo Region - almost twice the provincial average. The concentration of Dairy farms in Waterloo Region is an important factor in contributing to the total value added estimate of $130.5 million for the region.

2.4.12 Farm Capital

In 2000, Waterloo Region reported $1.3 billion in total farm capital, which represents 3.6% of the provincial total (Table 2.16).[9] Woolwich had the highest ranking for value of farm capital at $460 million (33.2%), followed by Wellesley at $348 million (25.1%) and Wilmot at $330 million (23.8%). These three municipalities combined account for 82% of the region's total farm capital value. On a per farm basis, Kitchener, North Dumfries and Cambridge were the top ranking municipalities. Kitchener reported the highest average value of farm capital at $1.48 million per farm followed by North Dumfries at $1.42 million per farm. The average value of farm capital per farm was higher than the provincial average in each municipality with the exception of Wellesley. The concentration of livestock and poultry farms in Waterloo Region is a major factor influencing the high average farm capital values. The cost of modern livestock facilities can easily exceed half a million dollars. In the Dairy sector, milk parlors alone range in cost from $100,000 to $300,000 depending on the size of the herd and the type of automated equipment (Hyde et al., 2002. p.4).

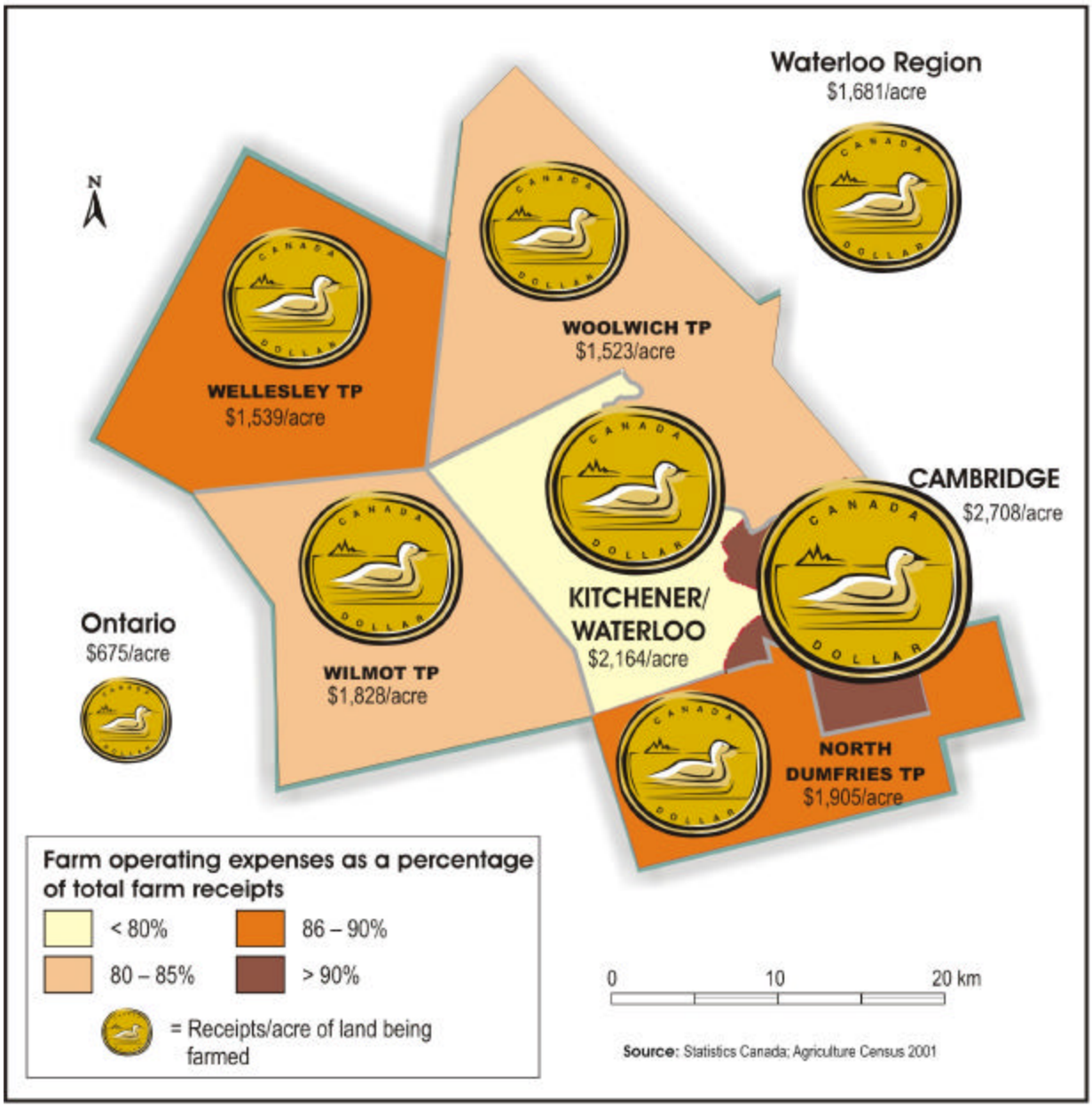
Table 2.16 Total Farm Capital, 1995 and 2000

	1995			2000		
	Number of farms	Total farm capital - market value	Farm capital per farm	Number of farms	Total farm capital - market value	Farm capital per farm
Ontario	67,520	$40,860,936,035	$605,168	59,728	$50,529,783,505	$845,998
Waterloo Region	1,590	$1,114,270,987	$700,799	1,444	$1,386,845,041	$960,419
North Dumfries	134	$130,566,270	$974,375	117	$165,754,341	$1,416,704
Cambridge	42	$41,562,077	$989,573	32	$39,028,689	$1,219,647
Kitchener	43	$56,090,725	$1,304,435	29	$42,969,439	$1,481,705
Wilmot	307	$248,695,636	$810,084	271	$330,004,333	$1,217,728
Wellesley	522	$263,031,636	$503,892	501	$348,493,409	$695,596
Woolwich	542	$374,324,642	$690,636	494	$460,594,830	$932,378

Source: Statistics Canada, 1996, 2001.

[9] Farm Capital includes the value of farm machinery, livestock and poultry, and land and buildings.

Map 2.3
Waterloo Region
Gross Farm Receipts per acre of land being Farmed and Farm Operating Expenses as a Percentage of Total Gross Farm Receipts, 2000



Dollar coins are used to illustrate the relative difference in average gross farm receipts generated per acre of land being farmed at the township level. The actual average dollar value per acre is also presented. The overall average for Waterloo Region and Ontario is presented for comparison. Each township is colour-coded to represent the average level of farm operating expenses as a percentage of total farm receipts.

2.4.13 Agriculture Employment and Characteristics of Farm Operators

In 2001, Agriculture directly supported 3,450 jobs in Waterloo Region consisting of farm operators/managers, farm employees and support activities related to farming.[10] This represents 1.5% of the total workforce for Waterloo Region which is slightly lower than the provincial average of 1.9% (Table 2.17). There were 875 fewer people employed in Agriculture in Waterloo Region in 2001 compared to 1996. This represents a 20% decline in agricultural jobs which is consistent with the provincial rate of job loss in this sector during the same period.

Table 2.17 Employment by NAICS Industrial Sector for Waterloo Region and Ontario, 2001

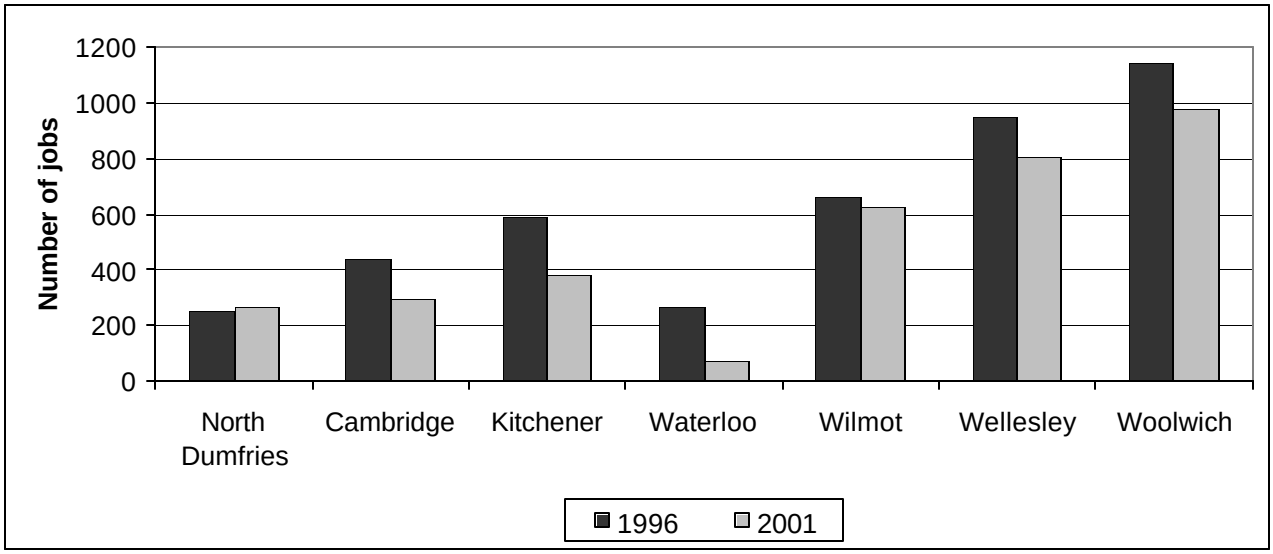
NAICS Industrial Sector [a]	Ontario		Waterloo Region	
	Number of jobs	Percentage of total jobs	Number of jobs	Percentage of total jobs
All industries	5,713,900	100%	232,905	100%
Agriculture	106,470	1.9%	3,450	1.5%
Forestry	10,765	0.2%	90	0.04%
Mining and oil and gas extraction	19,885	0.3%	175	0.1%
Utilities	44,930	0.8%	910	0.4%
Construction	332,250	5.8%	13,510	5.8%
Manufacturing	932,075	16.3%	59,325	25.5%
Wholesale trade	268,355	4.7%	11,275	4.8%
Retail trade	638,195	11.2%	24,875	10.7%
Transportation and warehousing	269,655	4.7%	9,775	4.2%
Information and cultural industries	163,160	2.9%	4,575	2.0%
Finance and insurance	283,855	5.0%	12,740	5.5%
Real estate and rental and leasing	105,395	1.8%	3,270	1.4%
Professional, scientific and technical services	410,635	7.2%	12,745	5.5%
Management of companies and enterprises	7,690	0.1%	1,090	0.5%
Administrative and support services [b]	236,710	4.1%	7,755	3.3%
Educational services	358,765	6.3%	16,395	7.0%
Health care and social assistance	517,390	9.1%	17,540	7.5%
Arts, entertainment and recreation	113,975	2.0%	3,315	1.4%
Accommodation and food services	352,765	6.2%	12,435	5.3%
Other services (except public administration)	261,205	4.6%	10,560	4.5%
Public administration	298,685	5.2%	7,095	3.0%

[a] The North American Industry Classification System (NAICS) is an industry classification system developed by the Statistical agencies of Canada, Mexico and the United States. The NAICS classification system replaces the Standard Industrial Classification system which was used by Statistics Canada prior to the 2001 Census.
[b] Includes waste management and remediation services.
Source: Statistics Canada, 2001.

[10] Support activities related to agriculture include crop planting/ spraying/harvesting services, farm management services, farm product sorting/grading/packing (for the grower), orchard fruit picking, livestock and poultry breeding services, horse boarding/training (except racehorses), horseshoeing, sheep dipping and shearing (North American Industry Classification System - NAICS, Statistics Canada, 1997). Total employment associated with farm support activities amounted to 180 jobs in Waterloo Region in 2001 (Statistics Canada, 2001).

As shown in Figure 2.6, Wellesley and Woolwich account for over 50% of all farm jobs in Waterloo Region. All of the municipalities in Waterloo Region experienced job losses in the agricultural sector between 1996 and 2001 except for North Dumfries where there was a 6% increase in farm jobs.

Figure 2.6 Employment in the Agriculture Sector in Waterloo Region, 1996 and 2001



Source: Statistics Canada, 1996, 2001.

It is important to emphasize that the decline in employment does not reflect trends in farm productivity. As noted earlier in the report overall farm productivity has increased substantially. In the dairy sector for example, annual milk shipments by Waterloo Region farmers increased from 98 million litres in 1996 to 107.9 million litres in 2001 (Dairy Farmers of Ontario). In the poultry sector, the production of broilers, roasters and Cornish hens by Waterloo Region farmers increased from 14.7 million kgs in 1996 to 20 million kgs in 2001 (Statistics Canada, 1996, 2001).

In 2001, Waterloo Region reported 1,955 farm operators down from 2,220 in 1996 (Table 2.18). Seventy-eight percent of all farm operators in Waterloo Region are male and 22% are female - this compares to 73% and 27% respectively for the province. The average age of farm operators in the region is 46 years, which is 5 years younger than the provincial average age of 51 years. However, at the municipal level there is considerable variation. Kitchener and Cambridge reported an average age of 57 years and Wellesley and Woolwich reported average ages of 42 and 45 years respectively.

Table 2.18 Characteristics of Farm Operators - Gender, Age, 1996 and 2001

	Total number of farm operators	Male	Female	Under 35 years	35 to 54 years	55 years and over	Average age
2001							
Ontario	85,020	62,215	22,800	8,975	44,150	31,890	51
Waterloo Region	1,955	1,520	435	445	965	540	46
North Dumfries	170	130	45	15	85	75	52
Cambridge	45	30	5	0	20	25	57
Kitchener	45	30	10	5	15	25	57
Wilmot	380	290	95	50	210	120	49
Wellesley	650	535	115	220	305	130	42
Woolwich	670	520	150	165	335	170	45
1996							
Ontario	96,940	71,050	25,895	13,835	49,000	34,105	49
Waterloo Region	2,220	1,685	535	540	1,085	595	46
North Dumfries	190	145	40	20	95	75	52
Cambridge	55	40	15	0	20	25	55
Kitchener	65	55	15	10	30	30	53
Wilmot	455	340	120	70	245	140	48
Wellesley	690	540	155	230	325	140	42
Woolwich	760	565	190	200	370	185	45

Source: Statistics Canada, 1996, 2001.

There are a number of factors influencing employment trends in the agricultural sector. As a broad economic sector, agriculture in Ontario is undergoing extensive and rapid change and, correspondingly, the employment and skills characteristics of the agricultural sub - sectors continue to evolve equally quickly. For primary production activity, some of the issues appear to be clearer than others - the rapidly aging workforce and the trend toward increasing mechanization is an example. However, there is significant variability across agricultural sub-sectors with respect to farm operator age. The census reveals that multi-generational farms and larger operations are more likely to have younger operators and younger workers. Younger farm operators are also more likely to be employed in off-farm work and in some cases may be deriving the majority of their personal and/or family income from off-farm employment. A more detailed overview of broad agricultural employment issues and trends is provided in Appendix A.

At the regional level, the 2001 Census of Agriculture reveals several important characteristics and trends for agricultural employment in Waterloo Region, including the following:

- the median age of Waterloo Region farm operators is significantly lower than that of the province
- Waterloo Region operations are relatively more capital intensive and average gross receipts are higher than the provincial average
- the large Mennonite population significantly influences the overall employment/socio-economic situation.

There have been at least twenty agricultural economic impact studies conducted in Ontario since 1998, covering most of the province's counties and northern districts with significant agricultural activity. While the treatment of labour market, skills and training issues has not been entirely consistent across the studies, most have included these components in surveys of and/or focus groups with farm operators. As one might expect, given the variable importance of the various production sub-sectors, the labour market and skills related findings vary somewhat by geographic area. However, some common elements emerge from the research and are presented in Appendix A. These broadly similar findings are summarized as follows:

- The skills demanded of farm management personnel and labourers tend to be broadening and the diversity of skills needed within a given occupation is increasing.
- Given the low profit margins, and the increasing complexity of modern farm management, farm operators prefer workers with previous farm employment experience. This desire for experienced workers is in conflict with the reality that there is a decline in the number of workers from traditional sources.
- Farm operators require an increasingly sophisticated set of business management skills. These include skills related to financial management/accounting, applied computer skills (e.g., business financial software, production management related software, and information management applications), and human resource management/workforce development skills and knowledge.
- The so-called "soft skills" – abilities and aptitudes that include attitude, work ethic, and interpersonal communication skills, remain high on the list of desired skills among farm operators.

2.4.14 Summary

Characteristics and trends for the agriculture sector in Waterloo Region, include the following:

- Waterloo Region reported 1,444 farms and 225,800 acres of land being farmed in 2001.
- Between 1996 and 2001 the area of land being farmed in the region declined by 3.7% or 8,606 acres, which is a slightly higher than the provincial rate.
- The average farm size in Waterloo Region is 156 acres, which is considerably smaller than the provincial average of 226 acres. Average farm size in Waterloo Region increased by 6% between 1996 and 2001 which is consistent with the provincial trend.
- 80% of the farmland in Waterloo Region is used for a wide range of cropping activities including grain, oilseeds and forage crop production.
- 66% of all farms in Waterloo Region are primarily involved in livestock production, which is higher than the provincial average of 45%. Dairy and beef are the most common type of farms in Waterloo Region followed by hog farms and field crop farms.
- Waterloo Region has a very productive agricultural sector in relation to other counties in Ontario. Based on 2001 census data, Waterloo Region ranks:
    - 2nd overall in total receipts per acre of land being farmed
    - 3rd overall in total receipts per farm
    - 10th overall in total farm receipts
    - 18th overall in the province in terms of total farm numbers.
- Waterloo Region reported $379.6 million in total gross farm receipts in 2000, which represents 4.2% of the provincial total.
- Average net revenue per farm in Waterloo Region in 2000 amounted to $39,274, which is significantly higher than the provincial average of $21,534 per farm.
- The total value added component for agriculture in Waterloo Region amounted to $130.5 million in 2000. This translates into 34 cents of value added per dollar of gross farm receipts.
- Agriculture directly supports 3,450 jobs in Waterloo Region consisting of farm operators/managers and farm employees. Farm operators in Waterloo Region are on average younger than farmers in other parts of the province.

2.5 Agricultural Related Businesses and Economic Impact

2.5.1 Introduction

The economic impact of agriculture in Waterloo Region was measured through an accounting of the total sales and employment of Agriculture and Agriculture-related (agri-related) businesses located in Waterloo Region. This work involved an assessment of the direct, indirect and induced impacts of agriculture on the local economy. The methodology used was consistent with other agri-impact assessments completed across Ontario. An overview of the theory and applications associated with economic impact analysis is described in greater detail in Appendix B.

Direct Impacts

Data was taken from the 2001 Population Census of Canada and the 2001 Agricultural Census. This data yielded information on the economy of Waterloo Region including general labour trends. The direct impacts have been presented in earlier sections of this report. For the purposes of this study, direct impacts are the jobs and sales generated 'on the farm'.

Indirect Impacts

For the purposes of this study, indirect impacts are jobs and sales generated 'off the farm' by agri-related businesses which interact directly with farm operations through buying and selling products and services. It should be noted that 'agri-related' includes only those businesses that buy from or sell to the farm business; sales to farm families for personal consumption (e.g. household goods and services) are excluded from the indirect impact assessment, but are included later as induced impacts.

The research method used to measure the indirect impacts was a survey-based 'input-output-like' approach. This was completed through a telephone survey conducted between May and July 2003. The method and survey format was originally developed for use in a similar survey in Huron County in 1996 (Cummings, Morris and McLennan, 1998), and used again with some modifications (primarily translation into French) in the following parts of the province: Prescott, Russell, Stormont, Dundas and Glengarry Counties in eastern Ontario in 1998; Simcoe County, Lambton County and Perth County in 1999; Elgin, Middlesex, and Oxford Counties, Lanark and Renfrew Counties, and the New City of Ottawa in 2000; and two northern Ontario studies that covered Nipissing, Parry Sound, East Sudbury District, City of Greater Sudbury, Algoma and Manitoulin (2001).

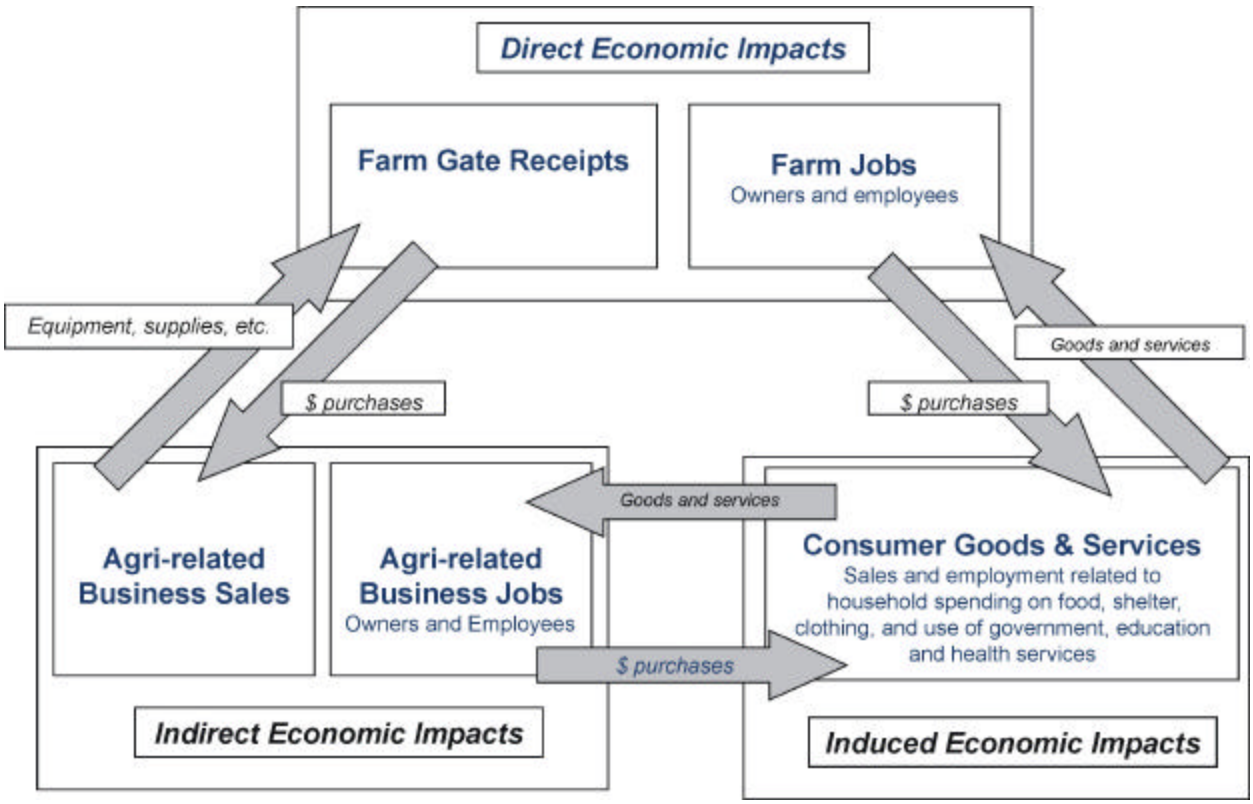
The methodology was designed to identify the value of gross sales and the jobs produced by a sample of agri-related businesses. From this sample, an estimate was produced for the total population of agriculture-related businesses in Waterloo Region. This in turn provided an estimate of the economic impact of agri-related businesses in Waterloo Region through indirect employment and sales.

Induced Impacts

An examination of the induced effects of agriculture was conducted. Induced employment refers to jobs in the Education, Government, Health and Social service sectors that are supported by the people employed in the agricultural sector or in agri-related businesses that use the services provided by these three service industries. Population Census (2001) employment data from the agriculture and manufacturing sectors were compared to service sector jobs in the three sectors mentioned above to estimate the number of induced jobs in Waterloo Region.

Figure 2.7 illustrates the relationship between direct, indirect and induced economic linkages.

Figure 2.7 Tracking the Economic Impacts of the Agriculture Sector



2.5.2 Agri-Related Business Survey and Indirect Economic Impacts

Development of the Business List and Survey Sample

The survey was based on a random sample of agri-related businesses in Waterloo Region. A list of agri-related businesses was developed by collecting business names and contact information from a number of sources including the Waterloo Federation of Agriculture and local economic development officials. A review of the Yellow Pages was also conducted and local newspapers were scanned.

Using the above process, a list of 713 agri-related businesses was compiled for Waterloo Region. After contacting 150 of these businesses, it was determined that 45 of the businesses (29.5%) did not have business ties to agriculture[11] or were no longer in business. This percentage was then used to estimate that a total of 210 businesses from the original list of 713 businesses had no connections to agriculture. The inventory was adjusted accordingly to reach a final estimate of 503 total agri-related businesses in Waterloo Region. In order to obtain a 95% level of confidence in the results, it was determined that approximately 200 of the 503 businesses would need to be surveyed. A total of 196 businesses were actually surveyed.

Location of Agriculture-related Businesses in the Survey

Agriculture-related businesses are located in rural areas, villages, towns and cities in every township across Waterloo Region. As shown in Table 2.18, the businesses that were randomly selected for the survey are located in every part of Waterloo Region. Approximately 45% of the agri-businesses surveyed are located in the three major urban centres (Kitchener, Cambridge and Waterloo) while 55% of the businesses are located in the surrounding townships. Elmira and New Hamburg each accounted for approximately 11% of the businesses surveyed while Ayr and Wellesley accounted for 8.7% and 8.2% businesses respectively. The remaining businesses surveyed are located in nine different communities across the region.

[11] Includes electrical contractors, plumbing contractors, accounting firms, auto parts stores, computer stores, etc.

Table 2.18 Number of Agri-related Businesses Surveyed by Location in Waterloo Region

	Number of businesses surveyed	Percentage of total businesses surveyed
Kitchener	35	17.9%
Cambridge	28	14.3%
Waterloo	25	12.8%
Elmira	22	11.2%
New Hamburg	21	10.7%
Ayr	17	8.7%
Wellesley	16	8.2%
Other communities (Includes St.Jacobs, Baden, Linwood, New Dundee, St. Clements, St. Agatha, Bloomingdale, West Montrose, Conestogo)	32	16.3%
Total	196	100.0%

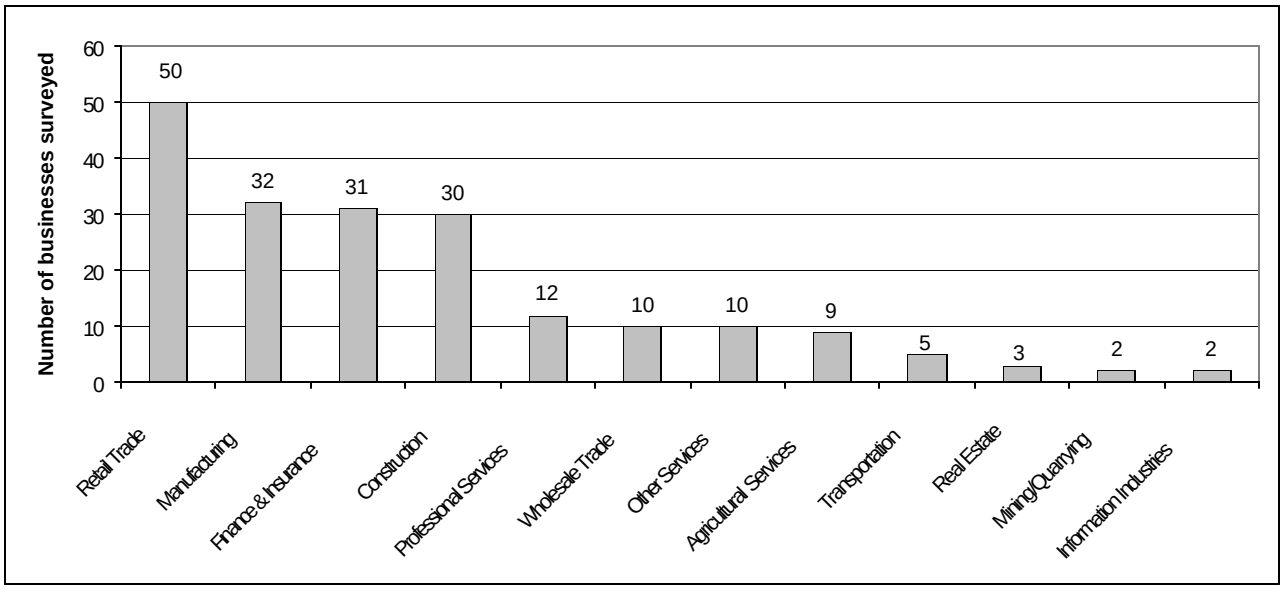
Source: Harry Cummings and Associates, 2003 Agri-business survey

Types of Businesses Surveyed

All of the businesses surveyed have a direct linkage with the agricultural sector in that they sell products or services directly to, and/or buy products or services directly from agricultural producers. These businesses also typically conduct trade with other sectors of the economy. The 196 surveyed businesses were categorized according to their primary activity, using the North American Industry Classification System (NAICS). This system separates Canadian businesses into twenty different industrial sectors such as Manufacturing, Retail Trade, and Agriculture and Related Service Industries.

As shown in Figure 2.8, businesses from 12 different industrial sectors were included in the survey. This indicates that the agriculture sector has linkages with almost every sector of the economy.

Figure 2.8 Number of Agri-related Businesses Surveyed by Industrial Sector



Source: Harry Cummings and Associates, 2003 Agri-business survey.

Several of the industrial sectors analysed in the study have comparatively stronger linkages with the agricultural sector. For example, a total of 50 businesses or 25.5% of the total businesses surveyed are in the Retail Trade sector. A total of 32 businesses or 16% of the total businesses surveyed are in the Manufacturing sector. Businesses in the Finance and Insurance sector also account for 16% of the total businesses surveyed. The fourth largest industrial sector was Construction which accounts for 15% of the businesses surveyed.

Statistics Canada classifies an industry with less than $5 million in annual sales as a small business. A medium size business has sales between $5 million and $25 million per year. Business with annual sales above $25 million are considered large. By this classification, agri-related businesses in Waterloo Region are generally small to medium in size. Approximately 44% of the businesses surveyed (86 of 196) had sales under $500,000 and 79% (155 of 196) had sales under $5 million. Approximately 18% (35 of 196) of the businesses surveyed are medium sized while 3% (6 of 196) of the businesses are large according to the Statistics Canada sales classification.

Business Characteristics by Industrial Sector

During the course of the telephone survey, business managers were asked to provide information on the level of gross sales and employment associated with their business operation. They were also asked to estimate the percentage of sales related to the agriculture sector and to identify the location of their sales (e.g. within Waterloo Region, other areas of Ontario, other provinces, international).

Businesses were asked to comment on any changes they've experienced over the past five years with respect to the number of people employed in their business. They were also asked if they expect the size of their workforce to change in the next five years. Additionally, businesses were asked to comment on any difficulties they've experienced in finding suitable employees from the local labour force. Finally, businesses were asked to provide any general comments on the significance of agriculture to their business and the local economy.

Findings for each of the twelve industrial sectors represented in the survey are discussed below. A considerable number of businesses expressed concern about the mad cow crisis and its potential impact on local businesses in terms of job losses. These concerns were expressed by many different businesses including feed companies, trucking companies, vet clinics, processing plants, and repair shops.

Characteristics of the businesses in each of the twelve industrial sectors represented in the survey are discussed below.

i) Retail Trade

Businesses included in the retail trade sector are primarily engaged in buying products for resale to the general public for personal or household consumption, and in providing

related services such as installation and repair. However, these businesses also have strong backward linkages to agriculture through the sale of products such as trucks and truck parts, building materials, and tools. In total, 50 businesses from the retail sector were surveyed, an example of which is Fierling Home Centre in Wellesley.

The 50 retail businesses surveyed consist of ten hardware/building supply stores, eight office supply stores, six fuel supply businesses, five farm supply stores, four auto sales/service centres, and 17 other various retail/service stores providing specialized sales and service related to chain saws, water pumps, generators, pressure sprayers, electric motors, gas engines, and hydraulic cylinders. The 50 retail businesses surveyed had average total gross sales of $4.3 million. Of this, an average of 19.6% or $846,000 was attributable to sales related to agriculture.

With respect to employment, approximately half of the ten hardware/building supply stores reported an increase in employment in the past five years and expect to hire more employees in the next five years. The remaining businesses expect their employment to remain the same over the next five years as they have no plans or to expand beyond their present size. Most of the businesses indicated that they are able to hire locally but some businesses expressed concern about the difficulty they experience in finding and maintaining part time staff. One business operator noted that it's difficult to find part time staff who are committed to the job. It was suggested that employees with an agriculture background are valued because of their ability to respond to the needs of agricultural clients. Business operators are interested in employees with customer service and communication skills. One operator noted that there is specific interest in employees with plumbing and electrical knowledge. Several of the hardware businesses emphasized the importance of the agriculture sector in supporting their business and other businesses in the local economy. As noted by one business operator, "if there's no agriculture, there's no hardware business." One business noted that the bovine spongiform encephalopathy (BSE or mad cow disease) crisis is having an impact on their business now and will continue to impact local retailers in Waterloo Region.

The eight office supply stores surveyed experienced little or no change in employment in the past five years and don't anticipate hiring additional employees in the next five years. Most of these businesses are happy with their current business size and their ability to provide personal service. All of these businesses reported that they are able to find local help.

The six fuel supply businesses experienced little or no change in employment in the past five years and don't anticipate hiring additional employees in the next five years. All of the businesses indicted that they are able to hire locally although there is typically a high turn over in part time staff. Farm businesses are seen as an important part of the petroleum business representing a "significant part of the overall volume of product sales" according to one business operator. Farmers are seen as "loyal and honest paying customers." One business that specializes in oil products expects to see a drop-off in business as more farms convert from oil to natural gas.

Only one of the five farm supply stores experienced an increase in employment in the past five years. One of the businesses started operations within the past five years. Two of the businesses expect to hire additional employees in the next five years while the other three expect employee numbers to remain the same. All of the businesses have been able to find labour through the local labour market. However, it was suggested by one operator that university students are less inclined to work in positions that only offer 12 weeks of seasonal full time work. It was also noted that employees with farm backgrounds are valued because of their ability to relate to the farm community. Most of the businesses acknowledged that agri-related trade is important to the local economy.

The four car sales/service businesses have experienced only minor changes in employment over the past five years and only one business expects to hire more employees in the next five years. All of the businesses reported that they are able to hire locally but admit that it is a challenge to find people with good customer service skills.

The remaining 17 businesses from the retail sector offer a mix of products and services as noted above. Five of the businesses indicated that they have increased employment in past five years and nine of the businesses expect to hire more employees in the next five years. Most of the businesses indicated that they are able to meet labour needs through local labour pool. Areas where there appears to be a lack of experienced employees includes water pump repairs, generator repairs, and auto mechanics. One of the businesses noted that they've increased sales as a result of consolidation in the farm equipment sector. Business operators recognize agriculture as an important component of the local and economy and some operators feel the sector is largely unappreciated by the public. One operator emphasized that urban development needs to be more carefully planned to ensure that farmland is maintained for the well being of the rural economy. Another business operator noted that planners and policy makers must become better informed about the local agriculture sector and the importance of developing polices that do not restrict opportunities for small, medium and large type farm operations.

ii) Manufacturing

A variety of products linked to the agriculture sector are manufactured by businesses in Waterloo Region. In total, 32 businesses from this sector were surveyed. Backward linkages to agriculture exist through the sale of products such as concrete and farm equipment. An example of an agri-related manufacturing business in Waterloo Region is M.K. Martin Enterprises in Wellesley which manufacturers farm equipment.

The study found that the 32 manufacturing businesses had average total gross sales of $5 million. Of this, an average of 84%, or $4.3 million was attributable to sales related to the agriculture sector.

Most of the 32 businesses in this sector can be divided into one of two general manufacturing categories: equipment manufacturing and livestock/poultry feed manufacturing.

A total of 17 businesses are involved in manufacturing a wide variety of agri-related equipment including hay handling equipment, forage wagons, dump trailers, silos, custom grain dryers, conveyor systems, generators, livestock ventilation equipment, livestock chutes, farm gates, and other farm equipment and implements. Two other businesses manufacture concrete products used by the agriculture sector and one other business manufactures/processes wood shavings which are used as bedding material by livestock and poultry producers.

Close to 65% of the equipment manufacturing businesses reported that their employment increased in the past five years and most businesses expect to increase the size of their workforce in the next five years. Several of the businesses see opportunities for expanding both their domestic and international sales. Only two businesses suggested that their employment would decrease in the next five years as a result of planned retirement. While many of the businesses are able to meet their labour needs through the local labour force, there is increasing competition with other industries such as the auto industry for skilled employees. Skilled machinists, welders, and persons experienced in custom fabrication are in demand. Other types of valued experience include inventory management, sales and customer service. Business operators noted that the general public doesn't appreciate the size and importance of the local agriculture sector. As described by one operator, "farming is more efficient than ever and Waterloo Region needs to promote the wider economic benefits that are derived from the agricultural sector."

A total of 12 businesses are involved in manufacturing a variety of livestock and poultry feeds and feed supplements including feeds for beef, dairy, swine, and poultry. Many of these operations specialize in producing customized feed rations.

Approximately half of the feed manufacturing businesses reported that their employment increased in the past five years. Half of the businesses also expect to increase the size of their operations and workforce in the next five years. Most of the businesses surveyed reported that they have been able to hire local labour. One operator noted that as the milling industry becomes increasingly automated there is greater demand for employees with computer skills and knowledge related to quality control and food safety standards. All of the business operators noted the importance of agriculture to the local economy. As described by one operator, "if the farmers have money the economy does well." Business operators also expressed concern about the impact of the BSE crisis on their customers and the implications for the wider agri-food industry.

iii) Finance and Insurance

A total of 31 financial service and insurance businesses were surveyed. This consisted of 13 banks and credit unions which have backward linkages to agriculture through the

provision of loans and banking services to farm operations, and 18 insurance businesses that provide property and crop insurance. The Canadian Imperial Bank of Commerce in New Hamburg is an example of a business in the finance sector that provides services to the local agriculture sector.

As mentioned earlier in the report, sales data for finance institutions were calculated by multiplying the number of employees at the branch by an annual average salary of $35,000. The average total gross sales for the 31 finance and insurance businesses that were surveyed amounted to $2.6 million. Of this, an average of 20.4%, or $532,800 was attributable to sales related to agriculture.

With respect to employment the majority of the 13 banks surveyed reported no increase in employment in the past five years or a slight decline in employment – largely related to automation in the industry. However, approximately half of the banks expect to hire additional staff in the next five years. Many of the insurance companies reported increases in employees in the past five years and expect to hire additional staff in the next five years. Two of the insurance businesses were started within the past five years. One business operator indicated that growth in the insurance sector was tied to increasingly competitive rates and new products.

Most of the banks and insurance companies reported that they have been able to hire employees from the local workforce. However, some problems have been experienced in terms of employees having limited knowledge of the local agricultural sector. One bank noted that there is currently a high demand for skilled sales people with financial planning training. As well, some insurance companies are having difficulties finding licensed and experienced agents. One insurance company reported that many applicants are 'new entrants' to the industry with factory of labour experience and they lack the necessary skills. Another company reported that in-house training of staff is better than the training currently being offered by local colleges.

Almost all of the banks and insurance companies provided statements that emphasize the importance of agriculture in the local economy. Many of the businesses recognize the large role that agriculture plays in the local economy and some suggested that this role is likely underestimated or undervalued by many people. Banks and insurance companies alike acknowledge the significant economic spin-offs derived from agriculture, especially considering the large investments currently being made by local producers. Even companies that currently have minimal activity with the agricultural sector see potential for tapping into this "significant market."

Several businesses identified the BSE crisis as having a negative impact on the local farm sector that will ripple through other parts of the economy including trucking and meat packing/processing.

iv) Construction

Thirty businesses in the construction sector were surveyed. These businesses have strong backward linkages to agriculture through building construction, electrical

contracting, plumbing and heating, excavating, and well drilling. One example of a construction business in Waterloo Region with linkages to the agricultural sector is Graham Well Drilling Ltd. in Kitchener.

Average total gross sales for the 30 construction businesses surveyed amounted to $1.8 million. Of this, an average of 28.8%, or $517,000 was attributable to sales related to agriculture.

With respect to employment, just under half of the 30 businesses surveyed reported an increase in employees in the past five years while close to a third of businesses reported no change in employees over the past fives years. Only three businesses reported a decline in employees over the past five years.

Approximately 25% of the construction businesses expect to hire additional full time employees in the next five years. This includes businesses from each of the contractor types noted above. Close to 30% of businesses expect no change in employment in the next five years while the remaining businesses are uncertain if their employment situation will change in the next five years.

Only two of the businesses surveyed reported that they experienced problems when trying to employ local labour. Several businesses expressed that they were not interested in expanding while several others saw opportunities for substantial growth (plumbing, building construction, mechanical and electrical contracting). Most of the businesses identified agriculture as an important component of their client base. Even businesses that are moving more towards commercial industrial projects continue to acknowledge the importance of agriculture in supporting the local construction sector. One business operator suggested that there are considerable opportunities for electrical and plumbing contractors with agricultural experience to expand their client base.

v) Professional Services

Business service industries surveyed include accountants who provide financial accounting services such as general accounting and taxes, lawyers who provide legal services (particularly in relation to real estate transactions) and other consultants who provide specialized services. The survey included 12 businesses from this sector, including RAC Nutrition Inc. in Waterloo which provides technical services to farmers.

The 12 professional service businesses had average total gross sales of $250,000. Of this, an average of 20%, or $50,000 was attributable to sales related to agriculture.

The large majority of professional services businesses surveyed are accounting firms. The other firms in this sector include a legal firm and an agricultural consultant. Most of the businesses reported no change in their employment over the past five years but several businesses projected employment growth in the next five years. Only three of the businesses reported problems when trying to find adequate help through the local workforce. One business operator suggested that college graduates have adequate skills but require more training in interpersonal skills and customer service. Another

business operator expressed her disappointment in the limited number of schools that now offer training for legal secretaries. She reported that this has had a devastating effect on the ability of firms to find skilled labour.

vi) Wholesale Trade

A number of wholesale dealers have established backward links to the agriculture sector through the sales of lumber, farm machinery, and livestock feed. Forward linkages are also present, primarily through the purchase of seed and grain for resale. A total of 10 businesses from the sector were surveyed, an example of which is Vincent Farm Equipment Ltd. in Ayr.

The study found that the ten wholesale trade businesses had average total gross sales of $8.3 million. Of this, an average of 86.5%, or $7.1 million was attributable to sales related to agriculture.

With respect to employment, most of the businesses in this sector reported that their number of employees has increased over the past five years. The employment growth is largely tied to the farm equipment wholesalers. Most of the businesses also reported that they expect the number of employees to increase in the next five years. Many of the businesses expressed optimism for growth in the local agricultural sector and some businesses are refocusing on agri-related businesses to rebuild their operations. While few of the businesses have encountered problems with hiring local labour, it is becoming increasingly difficult to find people with agricultural experience. Having direct farm knowledge/experience is viewed as an asset when trying to communicate with farmers. Business operators also identified a need for persons with computer skills, sales and customer service skills, and mechanical skills.

There was general recognition of the diversified agricultural base in Waterloo Region and the crucial spin offs generated in other parts of the economy. Some businesses are diversifying their operations and offering equipment for other industrial sectors to ensure long-term growth.

vii) Other Service Industries

This sector comprises establishments, not classified to any other category, primarily engaged in repairing, or performing general or routine maintenance on motor vehicles, machinery, equipment and other products to ensure they work efficiently. A total of ten businesses from this sector were surveyed consisting of three custom welding shops and seven automotive repair shops. An example of a welding shop is Maurice's Custom Welding Inc. in Ayr which repairs farm machinery and equipment. An example of an auto repair shop is Martin’s Auto Clinic in Elmira.

Average total gross sales for the ten service businesses amounted to $1.3 million. Of this, an average of 18.8%, or $243,800 was attributable to sales related to the agriculture sector.

With respect to employment, most of the businesses reported no change in their employment figures in the past five years while several businesses reported small losses in job numbers. However, seven of the businesses in this sector anticipate increases in employment in the next five years while three others anticipate no change in the near future. While most of the businesses in this sector have been able to address their labour needs through the local workforce, some businesses have encountered problems finding qualified mechanics and people with collision repair skills. Welders can also be difficult to locate. According to one business operator, colleges are creating part of the problem by encouraging graduates to seek out positions with large companies in order to achieve job security. In some cases, welding jobs have been filled by employees without college certificates.

Several of the auto shops expect their business volume to increase as a result of the growth of certain communities such are Elmira. One of the welding shops is moving towards more manufacturing based activities and exploring market opportunities in the United States.

While several of the businesses note the trend toward fewer and larger farms, most of the businesses continue to recognize the important role of agriculture in supporting their business enterprise. As noted by one operator, "if farm income is down the whole economy is down." Another business operator suggested that the "agriculture industry is a good dependable base to work with." It was also suggested that the Ontario economy has become too dependent on the auto industry and that more effort should be placed in rebuilding the local farm equipment industry as a way of stimulating further job growth.

viii) Agricultural Services

Businesses in the agricultural services sector often have backward linkages in the form of services provided to farms such as veterinary services. More specialized services include breeding services and custom planting and harvesting. Nine businesses from this sector were surveyed. Linwood Vet Services is an example of a business that offers herd health services to the local agriculture sector.

Average total gross sales for the nine agricultural service businesses amounted to $1.96 million. Of this, an average of 91%, or $1.78 million was attributable to sales related to the agriculture sector.

With respect to employment, most of the businesses in this sector reported no increase in the number of people they employed in the last five years, nor did they project any increase in employment in the next five years.

However, two veterinary clinics reported an increase in the number of full time jobs at their establishment in the last five years. Furthermore, these firms expect to see an increase in full time jobs in the next five years. While both of the vet clinics commented on the increase in their client base, they noted that more clients are seeking small animal (pets) rather than large animal services. Both businesses commented on the

difficulties they were experiencing in finding veterinarians who specialize in large animals.

As noted earlier, businesses in this sector have strong linkages to the agricultural sector. Many of the business operators identified the agricultural sector as crucial to their client base and important to the foundation of the local economy.

ix) Transportation and Warehousing

A total of five businesses in the transportation and warehousing sector were included in the survey. These businesses have backward linkages to agriculture through the transport of livestock, grain, equipment, and raw milk. Forward linkages are also present through the purchase of grain and livestock from farms. An example of a business from this sector is Erb Transport based out of New Hamburg.

The five transportation businesses surveyed had average total gross sales of $14.6 million. Of this, an average of 76%, or $11.1 million was attributable to sales related to agriculture.

Three of the five businesses surveyed in this sector reported an increase in employees in the past five years and two of these businesses expect to hire more full time employees in the next five years. The bulk of additional employees would be drivers but dispatchers and dockworkers are also in demand. Employers are interested in drivers who have 5 years driving experience and the "right attitude" – i.e. they are willing to work. Businesses noted that they are able to find drivers in the local area but with difficulty. One of the biggest challenges is finding drivers who will work international routes as the demands of this type of work often have negative impacts on lifestyle.

Businesses pointed out that the local agricultural sector is very important to their business operations even though some of the businesses have greatly expanded their service area beyond the region. Waterloo Region is viewed as an ideal location for a transportation hub because of its central location in southern Ontario. One business expressed concern about urban sprawl in Waterloo Region and the threat it poses to the future viability agriculture in the region.

None of the businesses interviewed mentioned the possible impacts of the BSE crisis. At the time the businesses were interviewed, it may have been too early into the crisis to comment on the effects of the crisis. However, it is likely that these businesses will experience a drop-off in agri-related activity considering the large inventory of livestock in the region combined with the loss of markets.

x) Real Estate

Real estate agencies have backward linkages to the agriculture sector. The survey included three insurance businesses, an example of which is Peak Realty in New Hamburg.

Average total gross sales for the three businesses surveyed have been suppressed in order to ensure confidentiality.

Two of the three real estate businesses reported an increase in jobs at their firms in the last five years and both of these firms expect the number of jobs to increase over the next five years. The third real estate business has not experienced any change in employment in the past five years and does not expect to hire any additional labour in the near future. These firms have not experienced any difficulty in finding qualified labour. As noted by business operator, each staff member acts as an independent sales representative and it is assumed they have the necessary skills to be successful.

One of the operators emphasized the importance of the agricultural sector to the local economy and expressed concern about the long and short-term effects of the BSE crisis.

xi) Mining (Quarrying)

Two businesses in this sector were surveyed. They represent a backward linkage to agriculture by supplying sand and gravel. Oxford Sand and Gravel in Ayr is an example of a business in this sector with linkage to agriculture.

Average total gross sales for the two businesses in this sector have been suppressed in order to ensure confidentiality.

Both of the businesses surveyed in this sector have seen little or no change in employment in the past five years. One of the businesses expects their employment level to remain unchanged in the next five years while the other business operator is in the process of retiring. Both of the businesses have been able to meet their labour needs through the local labour force. With respect to the future of the local agricultural sector, one operator questioned the impact of new non-farming residents in rural areas and greater restrictions being placed on farming practices which could potentially undermine the viability of farm operations.

xii) Information Industries

Two local newspapers were surveyed as part of this sector: The Ayr News in Ayr and The Independent in New Hamburg.

Average total gross sales for the two businesses in this sector have been suppressed in order to ensure confidentiality.

Both of the businesses surveyed in this sector have reported no change in employment in the past five years and do not expect their employment situation to change in the next five years. One of the business operators commented that agriculture was extremely important to the local economy at one time but questioned if its influence has declined with the ongoing consolidation of small farms into fewer large farms and farms being taken out of production for other purposes such as gravel pits.

Industrial sectors not represented in the survey include:

- Utilities
- Management of Companies and Enterprises
- Administration and Support, Waste Management and Remediation Services
- Arts, Entertainment and Recreation
- Accommodations and Food Service

While the Waterloo Region economy has businesses that are involved in the five sectors noted above, the businesses may not have direct linkages to the agricultural sector or they may not have had enough local representation to be picked up by the survey sample.

Businesses in the Educational Services, Health Care and Social Assistance, and Public Administration (Government) sectors were deliberately omitted from the survey as their impacts are being considered under induced impacts.

2.5.3 Survey Results

Total Gross Sales for the Agri-related Businesses Surveyed

Total gross sales for the businesses surveyed include sales related and unrelated to the agriculture sector. For example, a plumbing business may have sales to farmers for their farm business, sales to farmers for their house, and sales to non-farmers. Agriculture-related sales include only those sales to farmers for operating the farm. Sales unrelated to agriculture include those of farmers for their personal use, as well as sales to non-farmers.

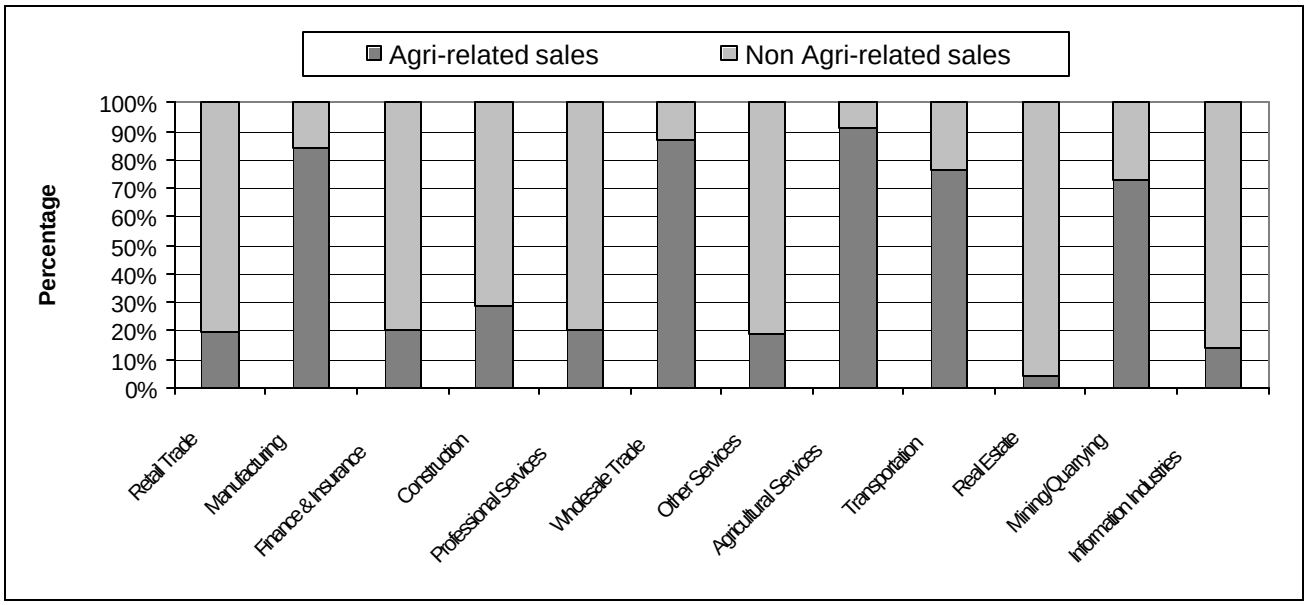
The survey determined that total gross sales were $711,472,000 for the 196 agri-related businesses surveyed.

Agriculture-related Sales for the Businesses Surveyed

The survey asked respondents to estimate the percentage of their sales that are related to agriculture, either by providing products and/or services to farm businesses, or by purchasing products of agricultural origin. The results indicate that $358,923,700, or 50.4% of total gross sales from the 196 businesses surveyed are related to agriculture.

As shown in Figure 2.9, several industrial sectors reported intensive agri-related sales activity. Over 50% of the total sales activity in the manufacturing, wholesale trade, agricultural services, and transportation sectors was related to agriculture.

Figure 2.9 Percentage of Agri-related and Non Agri-related Sales by Industrial Sector for the Businesses Surveyed



Source: Harry Cummings and Associates, 2003 Agri-business survey.

Location of Agri-related Sales

Businesses were asked to report on the location of their sales. As shown in Table 2.19, approximately 70% of the total agri-related sales were made outside of Waterloo Region.

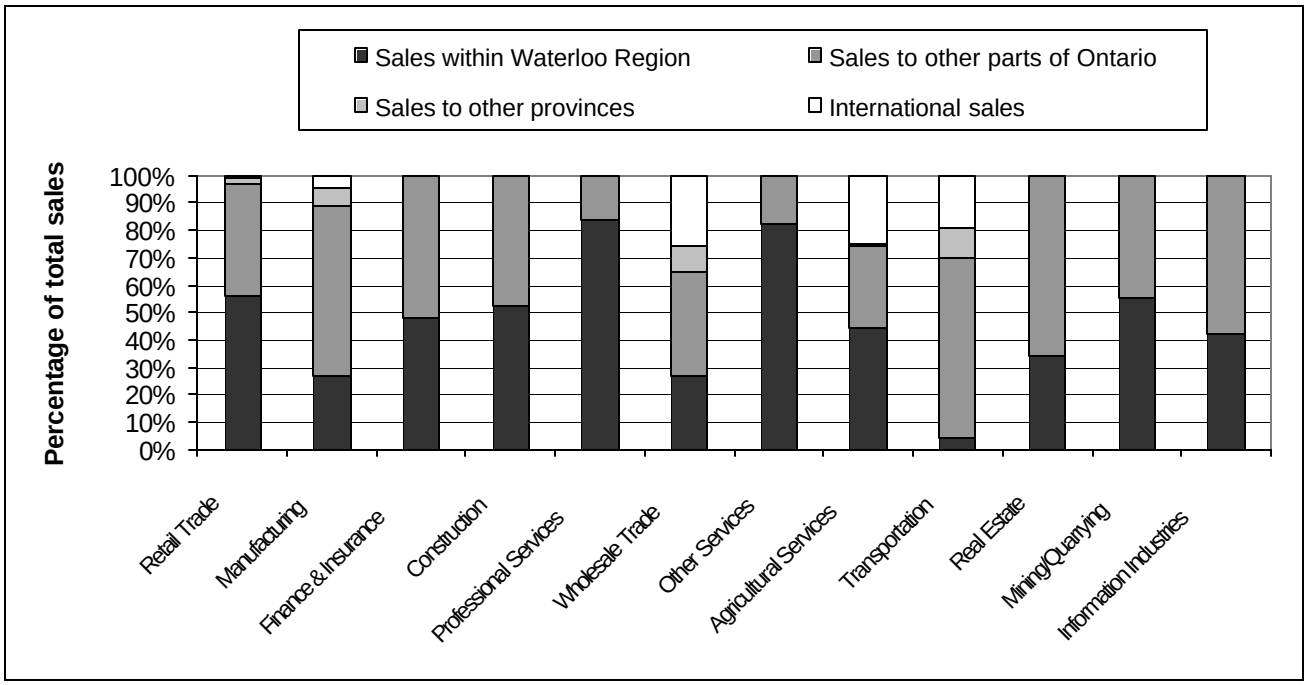
Table 2.19 Distribution of Total Agri-related Sales by Location of Sales for the Businesses Surveyed

	i. Sales within Waterloo Region	ii. Sales in other parts of Ontario	iii. Sales in other Provinces	iv. Sales outside Canada	Total Sales
Agri-related sales	$108,429,507	$188,255,019	$22,375,913	$39,863,300	$366,303,738
Percentage of Total Agricultural sales	30.2%	52.4%	6.2%	11.1%	100%

Source: Harry Cummings and Associates, 2003 Agri-business survey.

Some industries reported substantially more 'export' related sales activity than others. Manufacturing, finance and insurance, wholesale trade, agricultural services, and transportation sectors all reported more than 50% of their agri-related sales activity from areas outside Waterloo Region (Figure 2.10).

Figure 2.10 Percentage of Agri-related Sales by Location of Sales and Industrial Sector for Businesses Surveyed



Source: Harry Cummings and Associates, 2003 Agri-business survey.

Estimated Total Gross Sales for All Waterloo Region Agri-related Businesses

From the sample of 196 businesses, we can estimate the total gross sales for all 503 agri-related businesses in Waterloo Region. This includes sales both related and unrelated to agriculture. The 196 businesses surveyed represents 39% of the total number of businesses (196/503 *100). By dividing the total estimated number of businesses (503) by the total number of businesses that provided sales data (196), a sampling multiplier of 2.5 (e.g. 503/196 = 2.5) can be used to estimate the total gross sales for all agri-related businesses in Waterloo Region.

The estimated total gross sales for the 503 agri-related businesses amounts to $1.78 billion with agri-related sales accounting for approximately $897,309,300 of total sales. As shown in Table 2.20, agri-related businesses in Waterloo Region generate an estimated $271,073,766 in agri-related sales within Waterloo Region and another $626,235,578 in sales outside the region. Waterloo Region is clearly an important goods and service centre for farm operators in other regions.

Table 2.20 Distribution of Total Agri-related Sales by Location of Sales for All Agri-related Businesses

	i. Sales within Waterloo Region	ii. Sales in other parts of Ontario	iii. Sales in other Provinces	iv. Sales outside Canada	Total Sales
Agri-related sales	$271,073,766	$470,637,546	$55,939,781	$99,658,250	$897,309,344

Source: Harry Cummings and Associates, 2003 Agri-business survey.

Total Employment for the Businesses Surveyed

In estimating the total number of employees associated with the agri-related businesses, the survey estimated full time equivalents[12] for all full time, part time and seasonal employees. The share of sales activity reported by each business as related to agriculture was then used to estimate the share of employment related to agriculture.

The total number of employees at the 196 businesses surveyed is 4,939 which consists of 4,196 full-time employees, 508 part-time employees and 235 seasonal employees. Based on the hours and weeks worked over the course of a year, and converting to FTE's, the estimate for the total number of FTE jobs at the businesses surveyed is 5,647. This includes all employees (full-time, part-time and seasonal employees) for the businesses surveyed, regardless of whether or not they perform activities related to the agriculture sector.

[12] Based on a 1,875 hours per year workload (7.5 hours a day x 5 days a week x 50 weeks a year). Using the FTE jobs as a measure of employment allows for greater insight into the total number of jobs, at the full-time level that are supported by sales of goods and services to farms.

Total Agri-related Employment for the Businesses Surveyed

For the businesses surveyed, it is estimated that the employees spent 53.9% of their time on average on activities related to buying from and selling to farm operations which translates into 3,046 FTE jobs related to agriculture based on the total 5,647 FTE.

Estimated Total Employment for All Waterloo Region Agri-related Businesses

From the sample of 196 businesses, we can estimate the total employment for all 503 agri-related businesses in Waterloo Region. This includes employment both related and unrelated to agriculture. Using the sampling multiplier of 2.5 as discussed above, the estimated total employment for the 503 agri-related businesses amounts to 14,118 with agri-related employment accounting for approximately 7,616 of the total jobs.

Summary of Indirect Impacts of Agriculture in Waterloo Region

The analysis shows that businesses that buy from or sell to the agriculture sector in the Waterloo Region generate a significant amount of sales and employment. Furthermore, these companies generate flows of income and expenditure outside Waterloo Region in terms of both employment and income. It is estimated that agri-related businesses in Waterloo Region generated $897.3 million in agri-related sales in 2002.

Indirect employment is a further impact of the agriculture sector. It is estimated that agri-related businesses in Waterloo Region supported 7,616 full time equivalent agri-related jobs in 2002.

2.5.4 Induced Impacts

Estimated Induced Jobs

Induced agricultural impacts are impacts on businesses that benefit from the expenditure of wages and salaries of workers in the agriculture and agriculture-related sectors. For the purposes of the current study induced sales were not calculated, although this would clearly add a significant figure to the overall agri-related sales total of agri-related businesses in Waterloo Region through the salaries of employees in the Health and Social Services, Education and Government Services sectors.

Induced employment refers to employment generated by the wages of workers in an area. We refer to wages spent in the services sector on private or public services. The economy can be divided into two general ‘production’ components: goods producing (primary production including agriculture, manufacturing, and construction) and service producing. The service component consists of public sector services (health and social

services, education and government) and private sector services[13] (wholesale and retail trade, accommodation and restaurant, and finance and insurance related services). Induced effects are initiated through the spending of wages earned from agriculture and manufacturing, on public services; public service employees and agricultural workers purchase goods from retail stores; retail store workers require health services etc. This pattern of progressive spending reflects the chain of multipliers *induced* by the initial wage in the agriculture or manufacturing sector. The methodology we used to estimate the size of this multiplier is outlined below.

To make estimates of the induced jobs in Waterloo Region, Woolwich Township was selected to represent the study area as it reported the highest number of farm jobs in the region in 2001. The total direct employment figure for the two primary production industries in Woolwich, Agriculture and Manufacturing (980 and 1,745 respectively for a total of 2,725 jobs), was divided into the total number of jobs in the Health and Social Services, Education and Government sectors (820, 675 and 212 respectively for a total of 1,707 jobs). This calculation indicates that for every job created in the two primary production industries, 0.63 induced jobs were supported in the three public service sectors.

When this number is applied to the total number of direct and indirect jobs related to agriculture in Waterloo Region (3,450 direct and 7,616 indirect jobs for a total of 11,066 jobs X 0.63), it indicates that 6,971 induced jobs are supported by the agriculture sector.

2.5.5 Total Direct, Indirect and Induced Impacts

As shown in Table 2.21, there are 3,450 direct, 7,616 indirect and 6,971 induced jobs created as a result of the agriculture sector in Waterloo Region. Thus, farm operations, businesses they buy from and sell to, and services that support farmers and farm businesses, are estimated to support a total of 18,037 jobs.

When we take the total employment figure and divide it by the total number of direct agriculture jobs, we get a multiplier of 5.2. This calculation allows us to estimate that for every job in the agriculture sector, an additional 4 jobs are supported in the wider economy.

[13] Estimates for the 'private sector services' were excluded from induced employment because some of these jobs were already covered in the agriculture-related business survey. This helps in avoiding a double count of some jobs.

Table 2.21 Total Direct, Indirect and Induced Impacts of Agriculture in Waterloo Region

	Sales	Jobs
Direct [a]	$379,601,661	3,450
Indirect	$897,309,344	7,616
Induced		6,971
Total	$1,276,911,005	18,037

a Direct values are from Statistics Canada, 2001
Source: Harry Cummings and Associates, 2003 Agri-business survey.

In terms of dollars, agriculture makes a substantial contribution to the local economy. As shown in Table 2.21 direct sales associated with the agricultural sector amount to $379.6 million while indirect sales associated with agri-related businesses amount to $897.3 million. In total, approximately $1.3 billion in agri-related sales are generated in Waterloo Region. In order to estimate the sales expenditure multiplier for Waterloo Region, we divide the total amount of agri-related sales by the total amount of direct sales. This produces a sales expenditure multiplier of 3.4. This calculation allows us to estimate that for every dollar generated by direct agricultural sales (farm gate sales), an additional $2.40 in sales related to agriculture is also produced. Please note, these are gross agriculture-related sales and no attempt has been made to identify the "net value-added" component.

2.5.6 Comparison to Other Studies

A number of other agri-related business surveys have been conducted in various regions of Ontario using the same methodology applied here. Research has been completed for: Huron County (1998), Simcoe County (1999), Perth County (2000), Lambton County (2000) the combined counties of Prescott, Russell, Stormont, Dundas and Glengarry (1999), the combined counties of Frontenac, Lennox & Addington, Leeds and Grenville (2000), the combined counties of Elgin, Middlesex and Oxford (2000), the combined counties of Lanark and Renfrew (2000), the new City of Ottawa (2000), Algoma and Manitoulin Districts (2001), and the Blue Sky Region in Northern Ontario which is comprised of Nipissing, Parry Sound, the City of Greater Sudbury and the east portion of Sudbury District (2001). Tables 4.22 and 4.23 compare sales and employment data from research collected in other areas of Ontario with the results from the Waterloo Region agri-related business survey.

While sales and job figures are not directly comparable because of differences in size and characteristics of the study areas, the multipliers associated with these figures provide some insights into the importance of the linkages between agriculture-related business and farm enterprises.

As shown in Table 2.22, the sales multiplier estimated for Waterloo Region (3.4) is one of the highest reported among the different study areas. The sales multiplier for Waterloo Region is similar to that of Simcoe County (3) and the combined counties of Prescott, Russell, Stormont, Dundas and Glengarry (3.1).

Table 2.22 Total Agri-related Sales and Sales Expenditure Multiplier for Waterloo Region Compared to Other Studies ($ millions)

Study Area	Direct Sales [c] (Farm gate sales)	Indirect Sales (Agri-related businesses)	Total Agri-related sales	Sales Expenditure Multiplier
Waterloo Region	*$379.6*	*$897.3*	*$1,276*	*3.4*
Algoma Manitoulin	$32.2	$41.3	$73.6	2.3
Blue Sky Region [a]	$37	$43	$80	2.2
Lambton	$301	$472	$773	2.6
Elgin, Middlesex, Oxford	$1,131	$1,490	$2,621	2.3
Huron [b]	$512	$1,489	$2,001	3.9
Perth	$430	$653	$1,083	2.5
Simcoe	$265	$518	$783	3
Frontenac, Lennox & Addington, Leeds & Grenville	$183	$351	$534	2.9
Lanark & Renfrew	$98	$142	$240	2.4
Prescott, Russell, Stormont, Dundas & Glengarry	$363	$756	$1,119	3.1
City of Ottawa	$137	$265	$402	2.9

[a] The Blue Sky Region includes Nipissing, Parry Sound and the eastern portion of Sudbury District, as well as the City of Greater Sudbury.

[b] Huron County was the first study of this type to be carried out. The methodology has been continuously refined for the succeeding studies. The higher numbers associated with Huron County's Indirect Sales may reflect these refinements.

[c] Direct sales values are from Statistics Canada.

Source: Cummings et al., 1998, 1999, 2000, 2001 and 2003.

With respect to employment (direct, indirect and induced), Waterloo Region has the highest employment multiplier (5.2) in relation to 11 other study areas. The only region that approaches the Waterloo Region figure is Huron County with an employment multiplier of 4.5.

Comparing the number of on-farm jobs to jobs in agri-related businesses, we find that Waterloo Region has a 1:2 ratio, or one on farm job for every two jobs in agri-related businesses. Huron County, the largest agricultural county in the province in terms of total farm gate sales, has the highest ratio at 1:3.

Table 2.23 Total Agri-related Jobs and Employment Multiplier for Waterloo Region Compared to Other Studies

Study Area	Direct Agri. Jobs [c]	Indirect Jobs [a] (Agri-related businesses)	Induced Jobs	Total Jobs	Employment Multiplier
Waterloo Region	*3,450*	*7,616*	*6,971*	*18,037*	*5.2*
Algoma Manitoulin	1,081	242	2,050	3,373	3.0
Blue Sky Region [b]	1,330	404	3,329	5,063	3.8
Lambton	3,920	1,624	3,382	8,926	2.3
Elgin, Middlesex, Oxford	16,515	6,856	9,348	32,720	2.0
Huron	5,025	14,186	3,528	22,739	4.5
Perth	4,935	3,133	3,066	11,131	2.3
Simcoe	4,770	2,237	7,414	14,421	3.0
Frontenac, Lennox & Addington, Leeds & Grenville	4,325	1,935	5,321	11,581	2.7
Lanark & Renfrew	3,010	848	3,163	7,021	2.3
Prescott, Russell, Stormont, Dundas & Glengarry	5,955	4,516	7,007	17,478	2.9
City of Ottawa	3,510	1,045	5,466	10,021	2.8

[a] Indirect jobs are presented as full time equivalents.

[b] The Blue Sky Region includes Nipissing, Parry Sound and the eastern portion of Sudbury District, as well as the City of Greater Sudbury.

[c] Direct employment values are from Statistics Canada.

Source: Cummings et al., 1998, 1999, 2000, 2001 and 2003.

Agri-related businesses in Waterloo Region are deriving a substantially larger share of their sales from exports in comparison to other regions of the province. Approximately 70% of the total sales of agri-related businesses are attributed to sales outside Waterloo Region (Table 2.24).

Table 2.24 Location of Agri-related Business Sales: Waterloo Region Compared to Other Studies

	Location of Sales (%)				
Study Area	**Sales within the Study Area**	*Sales outside Study Area but within Ontario*	*Sales to other Provinces*	*Sales outside Canada*	**Total Sales outside the Study Area**
Waterloo Region	***30.2***	*52.4*	*6.2*	*11.1*	***69.8***
Algoma Manitoulin	**95.0**	5.0	--	--	**5.0**
Blue Sky Region [a]	**91.9**	6.6	1.5	--	**8.1**
Lambton	**83.6**	15.6	0.3	0.5	**16.4**
Elgin, Middlesex, Oxford	**66.8**	24.7	3.8	4.7	**33.2**
Huron	**42.9**	34.5	22.6		**57.1**
Perth	**65.5**	33	1.2	0.3	**34.5**
Simcoe	**43.6**	41.5	3.5	11.4	**56.4**
Frontenac, Lennox & Addington, Leeds & Grenville	**76.4**	20.5	0.7	2.4	**23.6**
Lanark & Renfrew	**86.2**	9.9	3.8	0.1	**13.8**
Prescott, Russell, Stormont, Dundas & Glengarry	**91.5**	5.8	1.5	1.2	**8.5**
City of Ottawa	**63.7**	36.2	0.1	--	**36.3**

[a] The Blue Sky Region includes Nipissing, Parry Sound and the eastern portion of Sudbury District, as well as the City of Greater Sudbury.
Source: Cummings et al., 1998, 1999, 2000, 2001 and 2003.

2.6 Summary of Economic Impact

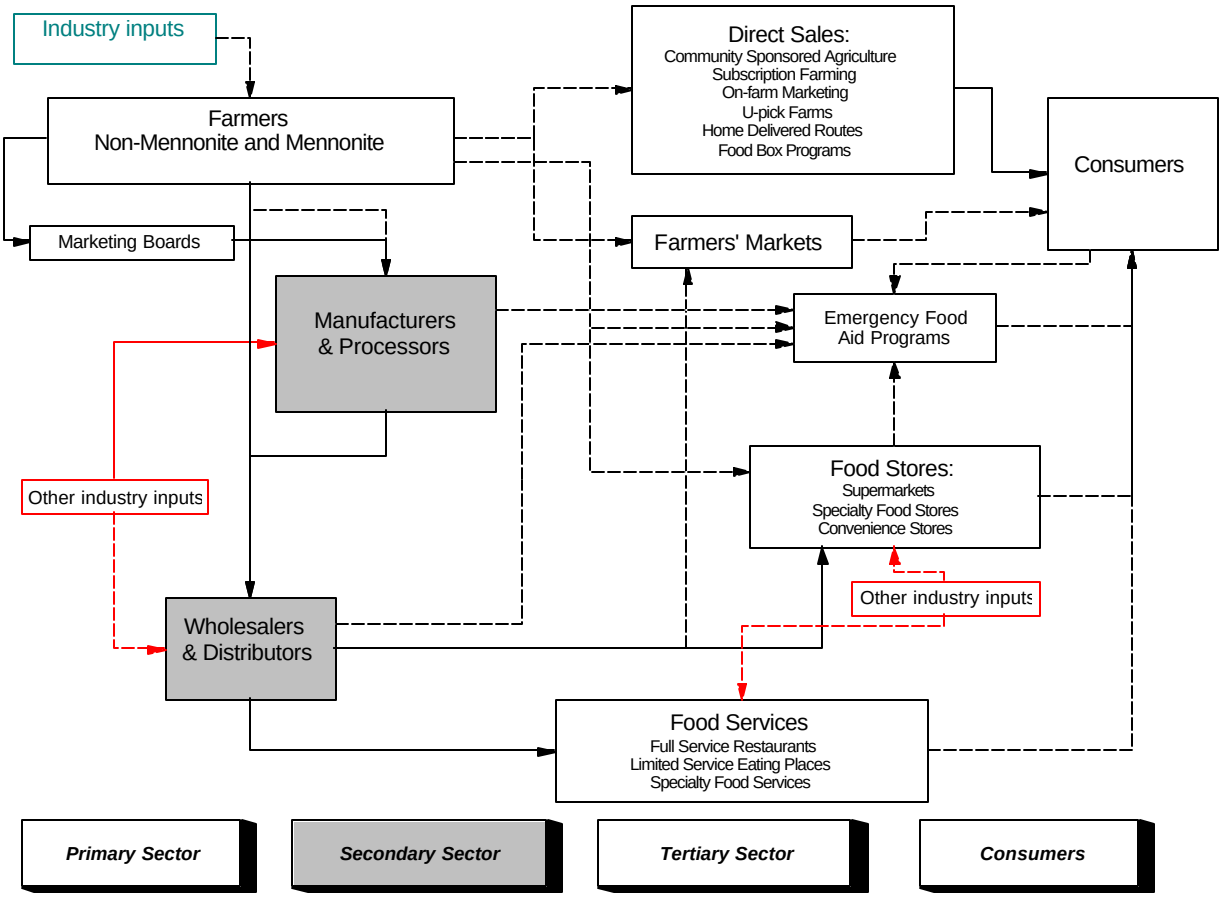
Key findings from the economic impact analysis include the following:

- The Waterloo Region agriculture sector has linkages with almost every other sector of the local economy.
- Agriculture in Waterloo Region supports 3,450 direct, 7,616 indirect and 6,971 induced jobs – a total of 18,037 jobs are supported by agriculture and its linkages to agri-related businesses and other sectors of the economy.
- Agriculture in Waterloo Region generated approximately $380 million in total farm receipts (direct economic impact).
- Agricultural-related businesses in Waterloo Region generated approximately $897 million in sales through transactions with local farmers (indirect economic impact).
- Approximately $1.3 billion in agricultural and agri-related sales are generated in Waterloo Region.
- Employment and sales expenditure multipliers indicate that:
    - for every job in the agriculture sector an additional four jobs are supported in the wider economy, and
    - for each dollar of farm income there is additional $2.40 in sales related to agriculture in the wider economy.
- Agri-related businesses are conducting a substantial amount of business activity outside Waterloo Region - Waterloo Region is an important service centre for farm operators in other parts of Ontario.
- Businesses from a variety of different industrial sectors see opportunities for expanding their operations and the agriculture sector is seen as playing an important role in the process.

3.0 Secondary Sector

3.1 Introduction

This chapter speaks to the secondary sector of the Waterloo Region Food System i.e. the manufacturing/processing and wholesale/distribution component. It starts with a summary of secondary sector trends in the broader food system, moves to a description of the methodology used to assess the secondary sector in the region, presents a variety of findings in the form of a secondary sector profile and closes with a summary of key findings.



3.2 Summary of Secondary Sector Trends in the Broader Food System - from the Literature Review (Appendix A)

The secondary sector has experienced significant change in recent years as processing and related operations have become increasingly specialized and automated (Connor, 1997, p.51). The variety of foods available has expanded, quality control has improved and creative ways have been found to reduce production costs. While many firms still

expand through acquisition; mergers, joint ventures, partnerships, contracts, and less formalized agreements are becoming common (Winson, 1993, p.211-212). The average income multiplier of food processors, at least in the United States, is higher then the multiplier for many other types of manufacturing - pharmaceuticals, concrete, steel mills, televisions, motor vehicles and aircraft, for example (Connor, 1997,p.80). Food processing industries can be categorized into three locational types – supply-oriented, demand-oriented and footloose – each with its own cost structure (Connor, 1997, p.142). Packaging costs have grown over time and in some operations exceed the costs of edible foodstuffs purchased by processors (Connor, 1997, p.222). Wholesaling has evolved with large retail-wholesale operations now dominating distribution (Toronto Food Council, 1996, p.4). The average distance food products travel has increased significantly raising concerns over associated environmental impacts (Pirog, 2001, p.13; Greenest City, 2002, p.1). Lastly, a growing interest in locally produced foods, ethnic foods and other specialty foods offers unique opportunities to today's processors (Toronto Food Council, 1995, p.7).

3.3 Methodology Used to Develop Secondary Sector Profile for Waterloo Region

Statistics Canada divides food manufacturing into nine distinct sub-sectors:

1. animal food manufacturing;
2. grain and oil seed milling;
3. sugar and confectionery product manufacturing;
4. fruit and vegetable preserving and specialty food manufacturing;
5. dairy product manufacturing;
6. meat product manufacturing;
7. seafood product preparation and packaging;
8. bakeries and tortilla manufacturing; and
9. other food manufacturing.

This report focuses on sub-sectors 2-9 which are most closely associated with the manufacturing of food for human consumption. It does not speak to the production of animal food although a partial overview of this sector is provided in Section 2.5 as part of the agri-business survey. Similarly, while the food and beverage industries are often grouped together, the report does not address beverage manufacturing. The report does, however, include three activities closely allied with food manufacturing – food wholesaler-distributors, food agents and brokers and refrigerated warehousing and storage.

An inventory of regional companies involved in the commercial preparation, processing, manufacturing, packaging, storing, wholesaling and distribution of food for human consumption was developed using Canada's Technology Triangle (CTT) Manufacturers Directory 2002 and Scott's Ontario Manufacturers Directory 2002. While there may be a few companies, which are not listed in either of these directories, it is felt that the inventory is a reasonable reflection of food-related manufacturing and trade industries operating in Waterloo Region in 2002. A list of the seventy-three companies identified is included as Appendix C.

To supplement information available from published resources such as Statistics Canada, a survey of the seventy-three companies was undertaken. The survey sought specific information regarding each company's products, value of shipments, value of purchases from within and outside Waterloo Region, employment, future plans, likes and dislikes about its current location, views on important factors in case of relocation, views on the role of the Regional government and thoughts on future trends/issues/opportunities in the industry.

Complete survey responses were received from 15 companies and partial responses (regional role and future trends questions) from 2 additional companies. At least three follow-up calls were made to non-responding companies. While the level of response (23%) was less than hoped, those that did respond provided valuable insights into the local industry. The participation of the responding firms is acknowledged and appreciated.

Statistics Canada was requested to provide detailed manufacturing activity information on each of the 11 sub-sectors of interest for the most recent year available (1999). While information on all the sub-sectors was available for the province, it was only available for the "human food cluster" of sub-sectors and the meat product manufacturing and bakery/tortilla manufacturing sub-sectors at the regional level. Due to the small number of firms in some of the sub-sectors, some data was suppressed for confidentiality reasons.

Using this methodology, attention focused on identifying the type and number of food-related companies, the location of the companies, the employment associated with the sector, the physical size of operations, the value added and value of shipments generated, the location types involved, the reasons behind location decisions within the sector, regional actions needed to support the sector and future issues and trends within the sector. The following profile resulted from this work.

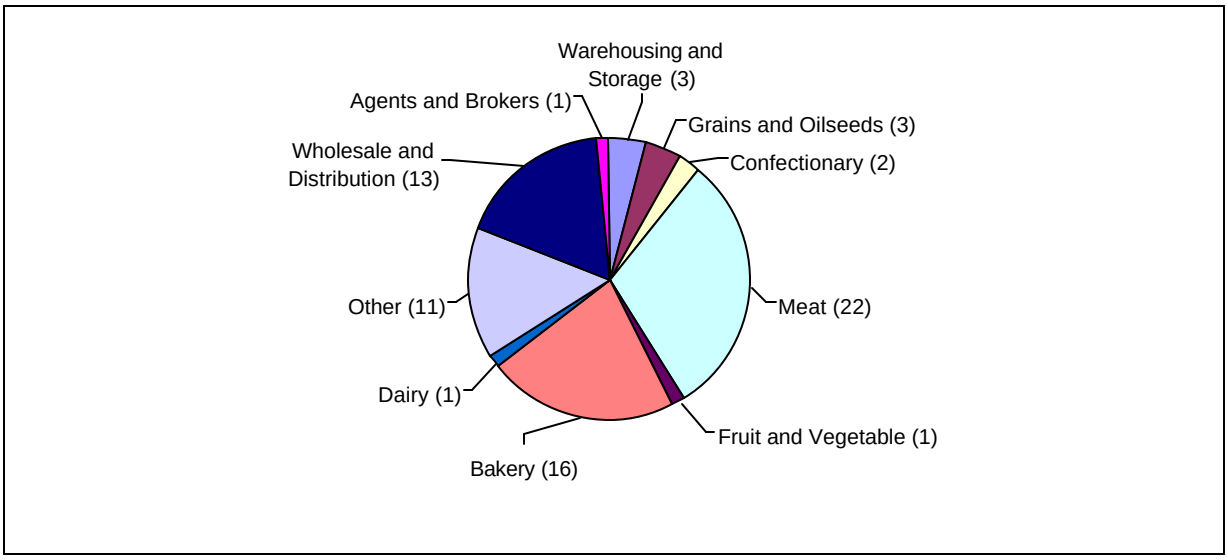
3.4 Profile of Secondary Sector in Waterloo Region

3.4.1 Type and Number of Food-Related Companies

Based on the review of the CTT and Scott's Manufacturing Directories for 2002, there were seventy-three food-related companies operating in Waterloo Region in 2002. As depicted in Figure 3.1, the meat processing sub-sector has the highest number of companies (22), followed by bakery (16), wholesale and distribution (13) and 'other' companies (11)[14]. The remaining sub-sectors had three or fewer companies. No companies were identified within the seafood product preparation and packaging sub-sector.

[14] 'Other' food manufacturing companies refer to establishments not classified to any other industry and primarily engaged in the manufacture of food. This includes establishments primarily in manufacturing and packaging for individual resale, perishable prepared foods such as salads, fresh pizza, fresh pasta, and peeled or cut vegetables (Statistics Canada, NAICS definitions).

Figure 3.1 Type and Number of Food-Related Companies in Waterloo Region, 2002

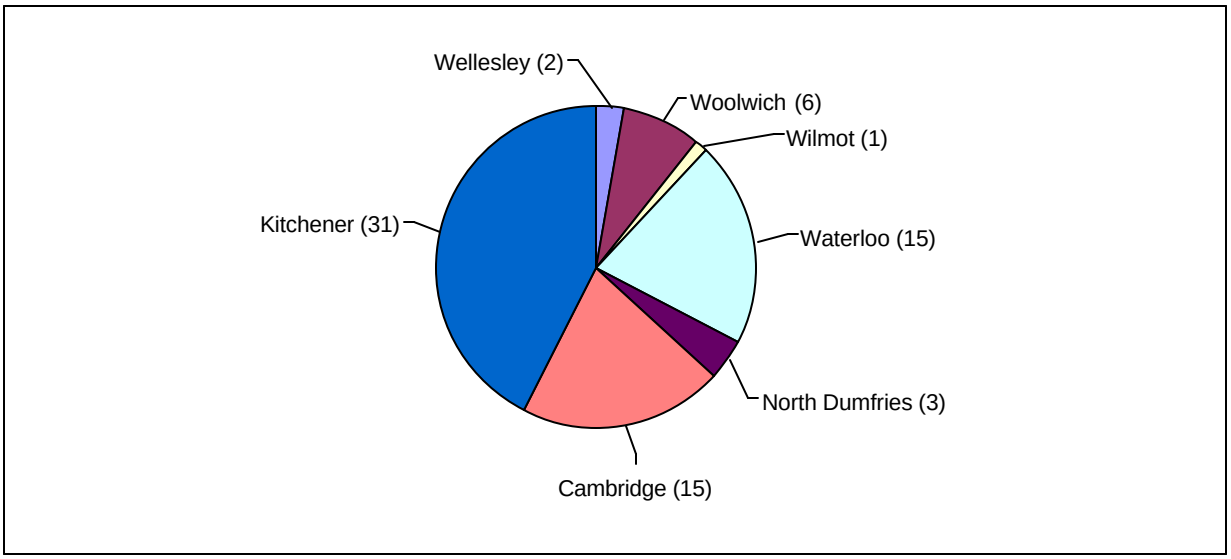


Source: Adapted from data obtained from Canada's Technology Triangle Manufacturers Directory 2002 and Scott's Ontario Manufacturers Directory 2002.

3.4.2 Location of Companies

The largest number of food-related companies are located within the City of Kitchener (31), followed by Cambridge and Waterloo with 15 each and by Wellesley, Woolwich, Wilmot and North Dumfries with 6 or less (Figure 3.2). The concentration in Kitchener is consistent with the City having the largest proportion of Waterloo Region's population (43% in 2001).

Figure 3.2 Number of Food Related Companies in Waterloo Region Local Municipalities, 2002



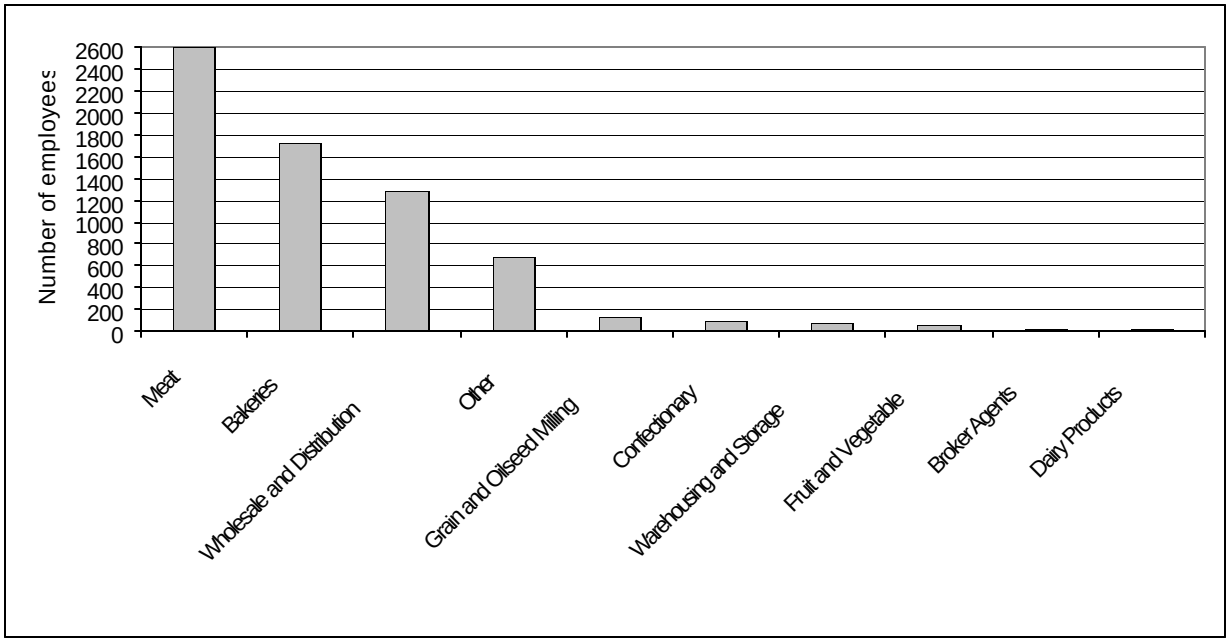
Source: Adapted from company location data obtained from Canada's Technology Triangle Manufacturers Directory 2002 and Scott's Ontario Manufacturers Directory 2002.

3.4.3 Employment by Sub-sector

In 2001, the Secondary Sector made up 2.9% of all jobs in Waterloo Region (Statistics Canada 2001 Employment Data supplemented with employment data from the CTT and Scott's Manufacturing Directories for 4 companies for 2002).

"Full time equivalent" employment in the 10 sub-sectors, having employees was 6,674 in 2002 (Figure 3.3). The meat product manufacturing sub-sector, the sub-sector with the largest number of companies (22), has the largest number of employees (2,609). The next largest food-related sub-sectors in terms of jobs are, bakeries, wholesale and distribution and "other" sub-sectors with 1,730, 1,285 and 685 employees respectively. Employment figures for the remaining sub-sectors are grain and oil seed milling with 130 jobs, confectionery (87), warehousing and storage (77), fruit, vegetables and specialties (46), brokers and agents (14) and dairy products (11).

Figure 3.3 Food-Related Employment by Sub-Sector for Waterloo Region, 2002



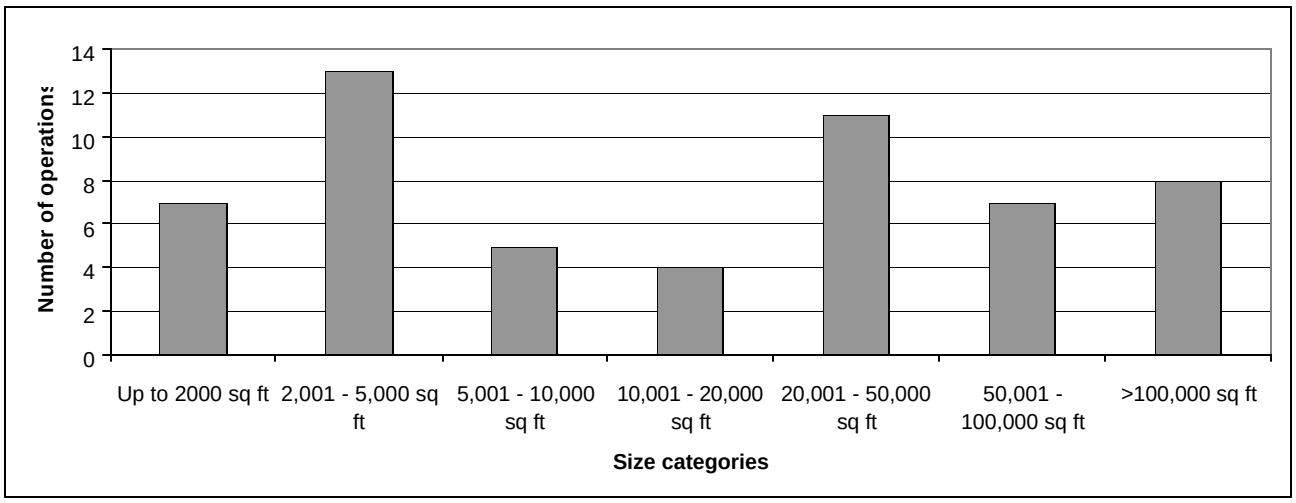
Source: Compiled from Canada's Technology Triangle Manufacturers Directory 2002, Scott's Ontario Manufacturers Directory 2002 and survey results.

Some of the food industry's larger employers include Schneiders Foods (1,515 employees), National Grocers Co. Ltd. (665), Dare Foods Ltd. (625), Hostess Frito-Lay Co. (500), Parmalat Canada Ltd. (400), Westons Bakeries (350), Pillers Sausages and Delicatesan (290) and Windsor Wafers Division of Parmalat Canada Inc (200). At the other end of the spectrum, a number of the region's smaller operations have as few as 1 or 2 employees.

3.4.4 Physical Size of Operations

Of the 57 companies for which plant size figures were available, size varied from 900 to 660,000 square feet. As shown in Figure 3.4 plant size tends to be under 5,000 square feet or over 20,000 square feet with fewer operations in the 5,000 to 20,000 square foot range.

Figure 3.4 Physical Size of Food-Related Companies in Waterloo Region, 2002



Source: Compiled from Canada's Technology Triangle Manufacturers Directory 2002, Scott's Ontario Manufacturers Directory 2002 and survey results.

Within each sub-sector, operation size varies greatly. For example, operations in the 'other' sub-sector ranged from 3,000 to 300,000 sq. ft. In the food wholesale and distribution sub-sector, plant size ranged from 900 to 298,000 sq. ft. and in the meat product manufacturing sub-sector plant size ranged from 1,200 to 660,000 sq. ft.

3.4.5 Value Added

While value added[15] figures were not available for all the regional sub-sectors of interest, presumably due to confidentiality issues, they were available for 1999 for the meat product manufacturing (12 establishments) and bakery/tortilla (17 establishments)

[15] Value added for an industry is calculated by subtracting the costs of materials, containers, supplies, purchased fuel and energy, and certain other purchased production inputs from value of shipments. Therefore, value added includes wages, salaries, fringe benefits, gross operating profits and many overhead expenses (Connor, p. 66).

sub-sectors and could be calculated for the human food manufacturing cluster[16] of sub-sectors (38 establishments)[17]. The pertinent figures are presented in Table 3.1 below.

Table 3.1 Value Added for All Manufacturing, the Human Food Manufacturing Cluster and the Meat Product and Bakeries & Tortilla Sub-sectors for Ontario and Waterloo Region, 1999

Industry	Mfg Activity Value Added ($000,000)	Mfg Activity Value Added / Production Worker ($)	Total Activity Value Added ($000,000)	Total Activity Value Added / Employee ($)
Ontario				
All Manufacturing	106,851.1	145,302	117,120.1	127,591
Human Food Manufacturing	7,654.8	128,257	10,837.2	137,519
Meat Product Manufacturing	1,091.3	68,381	1,161.2	61,316
Bakeries & Tortilla Mfg	1,101.3	76,078	1,833.4	93,632
Waterloo Region				
All Manufacturing	5,284.7	116,113	5,515.4	102,524
Human Food Manufacturing	511.4	102,447	554.0	91,864
Meat Product Manufacturing	185.9	73,949	217.6	69,284
Bakeries & Tortilla Mfg	116.7	73,501	116.1	63,396

Source: Statistics Canada, 1999

Whereas the regional total activity value added/employee figure for manufacturing is 80% of that of the province, the same figure for human food manufacturing is only 67% of that of the province. While the region's total activity value added figure/employee for meat product manufacturing ($69,284) exceeds the corresponding provincial figure ($61,316), its total activity value added/employee bakery and tortilla manufacturing is only 68% of that of the province. These figures suggest, that with the possible exception of the meat product manufacturing sub-sector, there is potential for significant increases in value added as existing processing operations modernize and new food producers are attracted to Waterloo Region.

Further insight into total value added in Waterloo Region can be gained using the location quotient (LQ) approach introduced in the findings on farm type in Chapter 2. Using the total activity value added data from Table 3.1, the LQs for the human food

[16] The human food cluster includes grain and oil seed milling, sugar and confectionery product manufacturing, fruit and vegetable preserving and specialty food manufacturing, dairy product manufacturing, seafood product preparation and packaging, bakeries and tortilla manufacturing, and other food manufacturing.

[17] As the list of companies generated from the CTT and Scott's Directories for 2002 show 56 establishments in the Human Food cluster, 22 in the Meat Product Manufacturing sub-sector and 16 in the Bakeries & Tortilla Manufacturing sub-sector, the 1999 total value added figures are likely a significant under estimate for the 2002 total value added figures for the Human Food cluster and Meat Product Manufacturing sub-sector and possibly an over estimate for the 2002 total value added figures for Bakeries & Tortilla Manufacturing.

manufacturing cluster and the meat product manufacturing and bakeries & tortilla manufacturing sub-sectors can be calculated. These values are presented in Table 3.2.

Table 3.2 Location Quotients for Total Value Added of the Human Food Manufacturing Cluster and the Meat Product and Bakeries & Tortilla Sub-sectors for Waterloo Region, 1999

Year	Human Food Manufacturing	Meat Product Manufacturing	Bakeries & Tortilla Manufacturing
1999	1.1	4.0	1.3

Source: Calculated using Statistics Canada data, 1999.

LQs of 1.1 for the Human Food Manufacturing Cluster, 4.0 for the Meat Product Manufacturing sub-sector and 1.3 for the Bakeries & Tortilla Manufacturing sub-sector indicate that in relative terms each of these areas of activity play a more significant role in generating value added for Waterloo Region than they do for the province. With a total value added LQ of 4.0 the Meat Product Manufacturing sub-sector plays a particularly important role in the region's economy.

3.4.6 Value of Shipments

Table 3.3 presents value of shipments figures for the same sub-sectors addressed in Table 3.1. As was the case with value added, value of shipments figures were suppressed for a number of sub-sectors due to confidentiality concerns related to the small numbers of firms involved.

Table 3.3 Value of Shipments for All Manufacturing, the Human Food Manufacturing Cluster and the Meat Product and Bakeries & Tortilla Sub-sectors for Ontario and Waterloo Region, 1999

Industry	Value of shipments of goods of own manufacture ($000,000)	Manufacture shipments/ employee ($)	Value of all shipments ($000,000)	Value of all shipments/ employee ($)
Ontario				
All Manufacturing	267,738.7	291,676	308,375.9	335,946
Human Food Mfg	19,935.6	252,974	24,100.3	305,822
Meat Product Mfg	4,459.9	240,252	4,887.5	258,079
Bakeries & Tortilla Mfg	2,174.3	111,041	3,458.5	176,625
Waterloo Region				
All Manufacturing	13,401.1	249,111	14,333.3	266,438
Human Food Mfg	1,191.5	197,591	1,390.4	230,581
Meat Product Mfg	631.6	201,160	777.1	247,473
Bakeries & Tortilla Mfg	239.0	130,473	256.3	139,888

Source: Statistics Canada, 1999

Using either manufacture shipments/employee or value of all shipments/employee, the regional figures lag behind the provincial figures for all categories considered except Bakeries & Tortilla Manufacturing manufacture shipments/employee. In the case of Human Food Manufacturing, the regional value of all shipments/employee is only 75%

of the provincial figure, suggesting there is considerable room for productivity improvement within the human food manufacturing cluster.

When the pertinent location quotients (LQs) for value of all shipments are calculated (Table 3.4.), it is apparent that the Human Food Manufacturing cluster and the Meat Product Manufacturing and Bakeries & Tortilla sub-sectors in Waterloo Region play a more significant role in generating dollar value in regional shipments than they do in generating dollar value in provincial shipments.

Table 3.4 Location Quotients for Value of All Shipments of the Human Food Manufacturing Cluster and the Meat Product and Bakeries & Tortilla Sub-sectors for Waterloo Region, 1999

Year	Human Food Manufacturing	Meat Product Manufacturing	Bakeries & Tortilla Manufacturing
1999	1.2	3.4	1.6

Source: Calculated using Statistics Canada data, 1999.

As was the case with the LQs for Total Value Added, the LQs for All Shipments indicate that the Meat Product Manufacturing sub-sector, in particular, plays a much greater role in the regional economy then it does in the provincial economy.

3.4.7 Income Multipliers

While the calculation of secondary sector income multipliers was beyond the scope of this study, the income multipliers due to capital expansions in various US food industries presented in the literature review indicate that the meat product manufacturing and dairy product manufacturing sub-sectors would have the highest income multipliers of the various sub-sectors being considered. Given the size of the meat product manufacturing sub-sector (22 of 73 operations and 2,609 of 6,674 employees), it is apparent that its multiplier affect would be substantial across the entire regional economy. Waterloo Region may wish to explore the magnitude of this relationship should it pursue more detailed work in the food-related area.

3.4.8 Wages and Salaries

Drawing on Statistics Canada data, Table 3.5 presents available Ontario and Waterloo Region wage and salary figures for 1999.

While the regional Bakeries and Tortilla manufacturing average wage and salary figures exceed the provincial averages for the sub-sector, the other food-related average wage and salary figures are somewhat lower than the corresponding provincial figures. This suggests that Waterloo Region should be reasonably competitive at least in the labour component of the inputs used in food manufacturing and related activities.

Table 3.5 Wages and Salaries for All Manufacturing, the Human Food Manufacturing Cluster and the Meat Product and Bakeries & Tortilla Sub-sectors for Ontario and Waterloo Region, 1999

Industry	Production & Related Employees		Administrative, office & other non-manufacturing employees	Total Salaries & Wages/ Employee/ Year ($)	Total Salaries & Wages ($000,000)
	Wages/Employee/ Year ($)	Wages/Hour ($)	Salary/Employee/Year ($)		
Ontario					
All Manufacturing	38,596	18.38	59,075	42,669	39,167.3
Human Food Manufacturing	30,963	15.18	52,133	36,111	2,845.7
Meat Product Manufacturing	27,940	14.13	50,555	31,384	594.1
Bakeries & Tortilla Mfg	28,647	14.14	39,099	31,367	614.2
Waterloo Region					
All Manufacturing	37,785	17.97	60,658	41,307	2,222.1
Human Food Manufacturing	26,928	13.52	45,617	30,145	181.8
Meat Product Manufacturing	24,008	11.45	46,524	28,497	89.5
Bakeries & Tortilla Mfg	31,503	15.58	41,025	32,771	60.0

Source: Statistics Canada, 1999

3.4.9 Location Types of Food Processing Industries

Of the 57 companies directly involved in food processing, 26 are supply-oriented, 14 demand-oriented and 17 footloose[18]. Given the relatively large number of meat processors (22), it is not surprising that the supply-oriented group is the largest While most of the 16 bakery companies fall into the demand oriented group and those that produce cookies, crackers, waffle cones etc. form part of the footloose category. The fact that Waterloo Region has attracted 17 footloose operations would suggest that it offers a reasonably attractive business environment as these companies could have just as easily located elsewhere.

3.4.10 Location Decision

Survey respondents gave a variety of reasons as the most important reason for choosing their current location. On reviewing these reasons, common themes were identified and used to categorize the responses. Table 3.6 sets out the common themes and the number of respondents whose reason falls within each theme.

[18] Supply-oriented, demand-oriented and footloose industries are defined in Section 2.2 of this report - Types of Food Processing Industries.

Table 3.6 Most Important Factor Given By Companies in Choosing Their Current Location

Common Themes	Number of Responses Falling Within Theme
Site used previously/historically for food-related purposes	6
Close to customers	3
Reasonable overhead costs – land, rental costs, municipal taxes, etc.	2
Close to owners place of residence	2
Sense of community	1
Plant met needs	1

Source: Compiled from Regional Municipality of Waterloo Food Industry Survey

While the number of responses is small, it would appear that the largest number of companies (6) are in their current location because they have been operating on the site for many years or because another food-related use was on the site prior to them commencing operation.

When companies were asked for the three other factors that were the most critical in choosing their current location, an even more diverse set of reasons was provided. By expanding the list of common themes set out in Table 3.6, it was also possible to categorize these responses. Table 3.7 sets out the expanded list of common themes and the number of responses falling within each theme.

Table 3.7 Tabulation of Top Three Factors Prompting Companies to Choose Current Location

Common Themes	Number of Responses Falling Within Theme
Site used previously/historically for food-related purposes	3
Proximity to customers	9
Reasonable overhead costs – land, rental costs, municipal taxes, etc.	3
Close to owners place of residence	1
Sense of community	3
Plant met needs	4
Good workforce – competent, reasonable	3
Good utilities – sewer, water, gas	2
Close to suppliers	1
No competition	1

Source: Compiled from Regional Municipality of Waterloo Food Industry Survey

From Table 3.7, proximity to customers stands out as the theme the largest number of companies looked for in choosing their current location.

When asked what three factors they liked least about their current locations, respondents noted a variety of concerns. Again using a common theme approach, Table 3.8 categorizes the number of concerns raised.

Table 3.8 Tabulation of the Three Factors Companies Like Least About Their Current Location

Common Themes	Number of Responses Falling Within Theme
Distance to customers	3
Condition of building	2
Inadequate municipal services – sewer, water, roads, pubic transit.	4
Labour costs/availability	2
Lack of community support	1
Excess traffic	2
Limited room to expand	3
Complaints from neighbours	2
Inadequate parking	1
High municipal taxes/development charges	1

Source: Compiled from Regional Municipality of Waterloo Food Industry Survey

No particular theme stands out in Table 3.8 as being a common problem for most respondents with respect to their current locations.

When asked for the three most important factors they would consider in the case of a relocation or major expansion, respondents provided a broad range of factors. Table 3.9 summarizes these.

Table 3.9 Tabulation of Top Three Factors Companies Would Consider in the Case of a Relocation or Major Expansion

Common Themes	Number of Responses Falling Within Theme
Proximity to customers	9
Reasonable overhead costs – land, rental costs, municipal taxes, etc.	8
Government incentives	2
Close to suppliers	3
Plant meets needs	3
Good workforce – competent, reasonable	4
Good municipal services –sewer, water, transit	4
Neighbouring uses	1
Location of competition	1

Source: Compiled from Regional Municipality of Waterloo Food Industry Survey

As was the case in determining current location, proximity to customers plays an important role in a company's decision to expand or relocate. Overhead costs would also appear to be of greater concern then most other factors.

3.4.11 Regional Government Role

Survey respondents were asked what actions the Regional Municipality of Waterloo should pursue in helping existing food industries thrive and in attracting new food industries. Their responses can be summarized as follows:

a) Existing Food Industries

Respondents suggested the Waterloo Region pursue the following actions to help existing food industries thrive:

- undertake needed infrastructure improvements such as the widening of Shantz Hill Road;
- provide economic assistance and help the industry obtain government grants for expansion;
- minimize property taxes and tax increases;
- promote agri-business;
- involve the agri-food industry in the decision making process,
- promote fair farm pricing; and
- foster sound land use planning which provides flexibility but avoids creating land use compatibility issues.

b) New Food Industries

Similarly, respondents proposed the following actions to help attract new food industries:

- ensure availability of affordable, well serviced commercial land;
- assist new immigrants to settle in the area and thereby bolster the local labour supply;
- minimize property taxes and tax increases;
- pay more attention to agriculture and food-related activities and less to promoting technology;
- set up an advisory body to gain input from local food industries on how to best promote the industry; and
- make needed transportation and servicing improvements.

3.4.12 Future Issues/Trends

When survey respondents were asked “what will be the major development trends/opportunities in your area of the food industry over the next five years?”, a variety of responses were forthcoming. They included:

- sales of frozen entrees, ready to serve (reheat) convenience foods and various types of home meal replacements will grow quickly;
- smaller focused plants will be used by some processors;
- more research and development will be required to develop/manufacture premium products with a unique taste;
- sales of certified organic products will increase;
- small producers will continue to be squeezed as supermarket chains gravitate toward exclusive arrangements with major suppliers;
- there will be a continued emphasis on food safety and modern manufacturing methods to improve quality, value etc.;
- there will be increased pressure for improved labelling from consumers interested in making healthy food choices;
- competition will increase as we move Increasingly to a global marketplace;

- less labour will likely be required as automation continues; and
- consumers will exhibit a variety of seemingly contradictory trends – some will move to more convenience “artificial” type foods; others will move back to real unprocessed food.

3.5 Summary

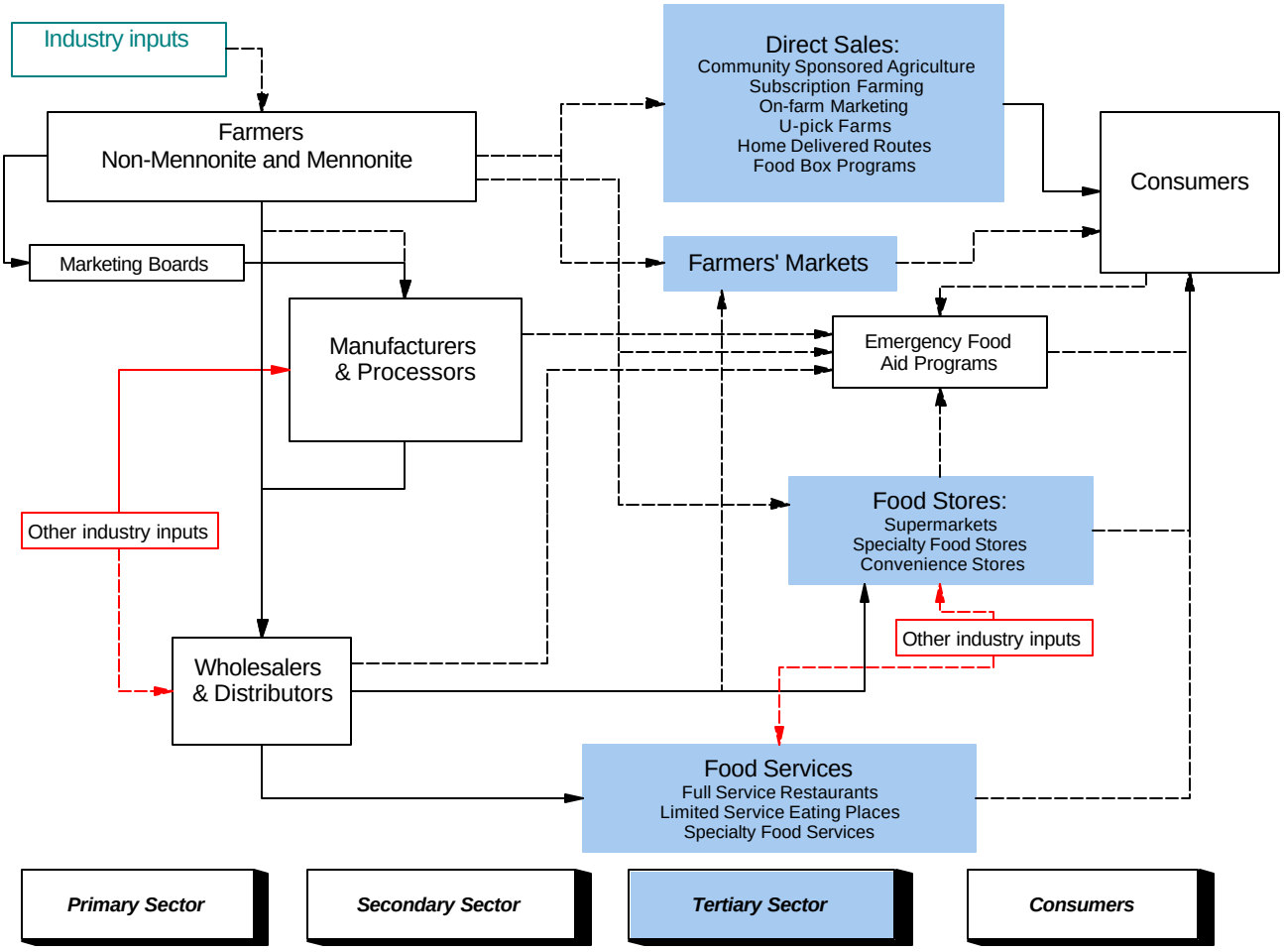
Characteristics and trends for the secondary sector in Waterloo Region, include the following:

- Waterloo Region has 73 food related companies.
- The meat processing and bakery sub-sectors make up over half of the region’s food-related industries and account for 65% of the total employment among food-related industries.
- Waterloo Region’s food-related companies are concentrated in Kitchener.
- There is considerable variation in company size
  - from 1 to 1,515 employees
  - from plants under 5,000 sq. ft. to plants over 100,000 sq. ft.
- Total value added per employee within the region lags behind the province for all manufacturing, the human food manufacturing cluster, and bakeries and tortilla manufacturing but exceeds the province for meat product manufacturing.
- The commercial preparation, processing, manufacturing, packaging, storing, wholesaling and distribution of food for human consumption plays an important role in the economy of Waterloo Region
  - 6,674 jobs in 2002
  - total shipments in excess of $1,390 million in 1999 and total value added in excess of $554 million in 1999.

4.0 Tertiary Sector

4.1 Introduction

This chapter speaks to the tertiary sector of the Waterloo Region Food System i.e. those involved in the direct sale of food to the consumer. Like the two preceding chapters, it starts with a summary of sector trends in the broader food system, moves to a description of the methodology used to gather data and information about the tertiary sector in Waterloo Region, presents findings for each of the four sub-sectors that make up the tertiary sector and closes with a summary of key findings. Although not involved in "selling to consumers", the role played by emergency food aid programs in the food system is also outlined.



4.2 Summary of Tertiary Sector Trends in the Broader Food System - from the Literature Review (Appendix A)

Direct Sales

Farmers appear to be showing renewed interest in direct selling. A primary reason for this is low farm prices. Farmers realize that prices received for produce sold directly to consumers can be substantially higher than typical wholesale prices, yet still below supermarket prices (Gale, 1995, p.19). Small farms also often turn to direct sales because of the barriers they face with wholesalers who only deal with large-volume producers. For larger farms, direct selling can be an important sideline or a means of selling products that do not meet the quality or size standards required by wholesalers (Gale 1995, p.19).

Farmers' Markets

Farmers' markets are likely the oldest and most common form of direct selling (Gale, 1995, p.20). They vary considerably in format but all allow the farmer to sell directly to customers without going through middlemen. They provide a social outlet for both vendor and customers and offer opportunities to educate the general public on where their food comes from and how it was produced. Consumers are particularly attracted by the "freshness" of the food they obtain from their local farmers' market (Cummings et al. 1999).

Food Stores

Supermarkets are undergoing significant consolidation and independent operators are moving to major or secondary wholesale-sponsored group programs (Toronto Food Policy Council, 1996, p.4; Cotterill, 2000, p.5). As a result, supermarket chains are garnering an increasing percentage of total food store market share. As supermarket chains consolidate, they have introduced a variety of new store formats to appeal to different consumer profiles (Connor, 1997, p.327). In their ongoing efforts to reduce costs and increase profits, they have added new technology and adopted new business practices (Connor, 1997, p.332). In response to consumer time constraints, many have expanded stores hours and introduced home-meal replacements (Little, 2000, p.15).

Food Services

In recent years, an increasing share of the consumer's food dollar is going to food services (Little, 2000, p.5). Several factors are associated with this trend – time constraints, growth in the number of single-person households and increased number of food service establishments (Little, 2000, p.6). Like food stores, food services have adopted new technology and business practices to increase efficiency and reduce costs. Labour saving equipment has been installed, computer software is being used extensively, drive-through and takeout facilities are becoming common and centralized

phone systems are being used to speed up deliveries. Food services companies are increasingly turning to non-traditional locations and entering into twinning arrangements to make marginal geographical areas more feasible for development (Little, 2000, p.15).

4.3 Methodology Used to Develop Tertiary Sector Profile for Waterloo Region

Direct Sales

Waterloo Region is home to a variety of producers who sell their farm products to consumers directly from the farm. The study focuses on two main groups of such producers. The first group consists of conventional farmers. The second group consists of Mennonite farmers. For the purposes of this study, the term Mennonite refers to those groups such as Amish, Old Order Mennonites, Conservative Markham Mennonites, etc. who for religious reasons abstain from using some or all of modern amenities such as hydro, telephones, cars and tractors. Mennonite farmers who embrace modern amenities are not differentiated from the conventional farm population.

The Buy Local Food Guide, a study on local farms called "Food Link", and the Waterloo Federation of Agriculture were used to identify conventional farmers selling directly to the public. A master list of 79 such farmers was developed from these sources and surveys were administered by telephone. All 79 producers were contacted and 53 completed the survey.

An individual from the Mennonite community volunteered to directly contact Mennonites doing direct selling and delivered surveys to these individuals on behalf of the researcher. The questionnaires were returned to a central location in person or by mail and then forwarded to the researcher. Of the 35 Mennonites contacted, 19 completed the survey.

Information on food box programs was obtained from one of the local organizers of the Good Food Box program

Farmers' Markets

Information on sales and jobs associated with several of the Farmers' Markets in Waterloo Region is available through market studies completed between 1999 and 2002. Select findings from the studies are reported on. Additional information was gathered from market management to fill gaps.

Food Stores

The three main types of food stores are supermarkets[19], convenience stores[20], and specialty food stores[21]. A survey of supermarkets and convenience stores was conducted to obtain data on sales and jobs. Estimates on sales and employment associated with the local food retail sector were determined based on data from Statistics Canada and other secondary sources as there was an inadequate response to the survey.

Region of Waterloo Public Health conducted a survey of specialty food stores through the Healthy Communities and Policy Program. Approximately 50 stores were identified for the survey. Twenty specialty stores participated in in-person interviews. Select findings from the survey data are presented in this report.

Food Services

Estimates on sales and employment associated with local restaurants[22] were determined based on data from Statistics Canada and other secondary sources. Estimates on sales and employment associated with special food services[23] were determined based on data from Statistics Canada and other secondary sources.

Emergency Food Aid Programs

The Executive Director of the Waterloo Region Food Bank and senior staff at several of the local food banks were contacted by phone to assist in developing a picture of how the region's emergency food aid system functioned, how much food was contributed on an annual basis, what the estimated value of contributions was and how many people were involved in operating the emergency food aid system.

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[19] NAICS defines 'Supermarkets' as establishments primarily engaged in retailing a general line of food, such as canned, dry and frozen foods; fresh fruits and vegetables; fresh and prepared meats, fish, poultry, dairy products, baked products and snack foods. These establishments also typically retail a range of non-food household products, such as household paper products, toiletries and non-prescription drugs.

[20] NAICS defines 'Convenience Stores' as establishments primarily engaged in retailing a limited line of convenience items that generally includes milk, bread, soft drinks, snacks, tobacco products, newspapers and magazines. These establishments may retail a limited line of canned goods, dairy products, household paper and cleaning products, and provide related services, such as lottery ticket sales and video rental. Convenience stores that sell gasoline are excluded from this sector.

[21] NAICS defines 'Specialty Food Stores' as establishments primarily engaged in retailing specialized lines of food products. This includes meat markets, fish and seafood markets, fruit and vegetable markets (excluding roadside stands), dairy product stores, baked goods stores, and candy, nut and confectionary stores.

[22] Includes Full Service Restaurants (dining lounge, family restaurant, etc.) and Limited Service Eating Places (coffee shops, fast food restaurants, drive-through/take-out restaurants, sandwich shops, etc.).

[23] Includes establishments primarily engaged in providing services at the customer's location, at a location designated by the customer, or from a motorized vehicle or non-motorized cart.

4.4 Profile of Tertiary Sector

4.4.1 Direct Sales Off the Farm

Waterloo Region is host to a variety of producers who sell their farm products directly to consumers. This section focuses on samples of two groups of direct sellers – Non-Mennonite direct sellers and Mennonite direct sellers. It speaks to the nature of the farms being operated by each group and the type and extent of the direct sales.

Non-Mennonite Direct Sellers

Of the 79 non-Mennonite farmers who were contacted to participate in the study, 53 completed the survey.

Land Use
The total area of farmland owned by this group of respondents amounted to 6,533 acres with an additional 1,719 acres being rented. The average area owned and rented amounted 123 acres and 64 acres respectively. Grains and oilseeds occupy the largest number of acres while fruits and berries occupy the smallest number of acres.

Table 4.1 Land Use and Area of Production (acres)

	Farms reporting	Range of acreage	Total acreage	Average acreage
Land Owned	53	0 - 505	6,533	123
Land Rented	27	0 - 400	1,719	64
Hay	46	10 - 100	1,734	38
Natural & Seeded	25	3 - 118	577	23
Grains & Oilseeds	47	10 - 400	4,298	91
Vegetables	22	2 - 300	625	28
Fruits & Berries	17	0.125 - 50	257	15

Source: Compiled from survey of 53 non-Mennonite farmers in Waterloo Region.

Some of the producers were involved in greenhouse production. The total area of greenhouse space reported by six farmers was 10,880 square feet. Most of these producers are selling bedding plants or flowers off the farm.

Sales
The total gross farm receipts reported by the farmers amounted to just over $8 million with average receipts per farm at $171,987. A few producers (6) either did not want to disclose their total gross farm receipts or were not sure of the amount. The majority of farmers (75%) indicated that they sell directly off the farm or along the roadside near the farm. On average, the farmers surveyed reported selling 52% of their produce as direct sales to consumers.

Five farms reported that they produced eggs and that all of the production is sold directly to consumers. Eleven farms are producing maple syrup for a total quantity of 5,660 litres or an average of 514 litres per farm. Only 2 farms are selling 100% of their

maple syrup production directly to consumers while another two farms are selling 50% of their product directly; the rest are selling to processors or sales outlets.

Farms involved in milk production (total of 32) reported producing a total of 606,965 litres or an average of 18,967 litres per farm. This production is not sold directly to consumers but rather is marketed through Dairy Farmers of Ontario. Only one farmer reported selling goat milk directly to consumers. Six farms reported that they produced cheese and total cheese production was estimated at 2,670 pounds (1,214 kg). The average produced per farm was 445 pounds (202 kg).

Producers provided a number of observations on their production and marketing experience. One producer suggested that local producers were not "playing on a level playing field with import producers, especially U.S. producers" due to differences in regulations related to herbicide and pesticide use. Similarly, another producer mentioned that competition from outside growers (i.e. Holland Marsh) make it difficult to compete. It was also suggested that small local producers could be avoiding the local farmers' markets where they would have to compete with large producers from outside the area. Another producer felt that pick-your-own sales were decreasing and, therefore, education in this area would be beneficial to heighten awareness.

One producer noted that "there are more and more people who want to buy from the farm, probably due to immigrant values and culture. It is good that children are learning more about agriculture. People are losing touch with agriculture, it is important to increase knowledge of agriculture." Another producer commented on how well the 'Buy Local! Buy Fresh!' program was working and would like to see greater promotion of the program.

A number of producers expressed concern that the rural population would continue to decline. High land values and competing land uses such as housing and gravel pits are placing pressure on farmers. Some producers commented on how they had to diversify their activities to remain viable. One producer opened a riding school to "keep the farm viable."

Employment

Many of the non-Mennonite farmers reported hiring at least one full time employee. Some farmers reported employing as many as 5 people in 2002. Many of the farmers indicated that they hired between two and five part-time or seasonal employees five years ago and suggested that they would need to increase their part-time/seasonal help to 5-7 employees in five years time. All of the farmers surveyed indicated that they have been able to meet their hiring needs to date. The average wage rate being paid is $6.70 per hour.

Mennonite Direct Sellers

Of the 35 Mennonite farmers who were contacted to participate in the study, 19 completed the survey.

Land Use

The total area of farmland owned by this group of respondents amounted to 2,527 acres. None of the respondents reported that they rented farmland. The average size of the Mennonite farms is 133 acres with a range in farm sizes of 54 to 245 acres. The large majority of farmland area was reported as being in hay production. Vegetables were grown on an average of 5% of the total farm acreage. Of those surveyed, 47% are growing fruits and berries with an average of 10.5% of the total farmland acreage in fruit/berry production. Two respondents reported that they had 2,000 and 720 square feet of greenhouse space, respectively, which was used flower production and marketed directly to consumers.

Sales

The total gross farm receipts reported by the farmers amounted to $3.4 million with average receipts per farm at $178,947. The range of total gross farm receipts reported by this group of respondents was $30,000 to $495,000. All of the respondents indicated that they sell a variety of products directly to consumers. Farmers on average reported 56% of their sales as direct sales to consumers. The types of products being sold directly to consumers include corn, wheat, cattle, hogs, maple syrup, eggs, beef, apples, milk, roasters, fruits, laying hens, lambs and rabbits. Included in this sales activity is the flow of goods and services that are exchanged through the barter system of trade with other farmers. Some farmers are selling 100% of their production through direct marketing to consumers. This includes food such as summer sausage, sweet corn, potatoes and roasting chickens.

Farmers suggested there were opportunities for increasing the amount of direct sales to consumers but the regulatory environment is posing problems. As noted by one farmer "there would be some potential for selling more off the farm but health standards and regulations, sometimes prohibit us from moving products direct from farm to consumer. For example, milk – we could potentially sell some for cheese making but this is not really allowed."

Employment

Most of the Mennonite farmers reported that they did not require hired help to assist with the farm operation as they rely on family members to meet their labour needs. This group does not foresee any dramatic increases in labour needs in the future. The nature of Mennonite society is to reduce 'outside' influences to as large a degree as possible. Self-sufficiency and the desire to remain self-sustaining preclude members of the general citizenry. Consequently, Mennonite farms are family operated and extended family are a reliable source of labour.[24] For those Mennonite farms that have hired help, the average hourly wage was $8.20.

[24] Extended family can include brothers and sisters, as well as, uncles and aunts and their families.

4.4.2 Food Box Programs

The Good Food Box program gets its boxes from the Field to Table organization in Toronto. Field to Table buys its food from the Ontario Food Terminal and has contracts with a number of Ontario farmers for produce during the Ontario growing season. The Good Food Box takes orders from local residents and deliveries occur once a month to 22 or 23 sites throughout Waterloo Region. The program currently offers five options – a large box of fruit and vegetables for $17, a large organic box, a small box of fruit and vegetables for $12, a small organic box and a box of just fruit. The program is planning to add a "family box" for $15, which will contain more usual fruits and vegetables then currently contained in the "large" box.

4.4.3 Farmers' Markets

Farmers' Markets in Ontario are experiencing a resurgence in popularity. This is associated with the desire of community residents to seek out and preserve an alternative shopping experience that is more personal in nature and more closely connected with the food producer. Indeed, a 1999 provincial study on Farmers' Markets found that customers strongly identify the local farmers' market as a key community icon that offers both economic and social benefits (Cummings et al. May 1999. p.66). Customers identified Markets as important venues that provide opportunities for interacting directly with farmers and learning more about where food comes from and the work involved in producing it (p.67).

Waterloo Region features four Farmers' Markets: Cambridge, Kitchener, Waterloo, and St. Jacobs. All four markets are open on Saturdays and at least one other day during the week (see Table 4.2).

Table 4.2 Waterloo Region Farmers' Markets and Operating Days

Market	Time of operation
Cambridge	Saturday : 6am to 1pm, year round Wednesday : 6am to 1pm, June – Oct.
Kitchener	Saturday : 6am to 2 pm, year round Wednesday : 8am to 2pm, June – Sept.
Waterloo	Thurs. & Sat. : 7am to 2pm, year round
St. Jacobs	Thurs. & Sat. : 7am to 3:30pm, year round Tuesday : 8am to 3pm, June – Sept.

In recent years two independent studies were conducted that offered detailed profiles of the Cambridge and Kitchener Farmers' Markets. These studies clearly reveal that Farmers' Markets have a significant role Waterloo Region's Food Economy.

Cambridge Farmers' Market

The Cambridge Farmers' Market has an estimated customer base of approximately 3,000 individual shoppers (Cummings et al., 1999. p.7). Cambridge Market customers

are loyal. Just over half of the customers visit the Market once a week and another third visit the market between two and three times a month (p.14). Furthermore, Cambridge Market customers are interested in buying local produce. Over 70% of customers think it's very important to buy products that are produced locally (p.26).

The Cambridge Farmers' Market features between 35 and 45 vendors during the year. The most important Market attraction for Cambridge Market customers is the fresh produce. However, customers also come to the Market to socialize with friends and to support local farmers (p.20). Over 80% of customers purchase vegetables at the Cambridge Farmers' Market while 77% of customers purchase fruit and 64% purchase meat products (p.24).

Cambridge Farmers' Market customers spend an average of $31 per visit to the Market which is higher than the provincial average of $20 (p.25 and p.52) and is largely related to the availability of meat products and value added products such as baked goods (p.33). The research also suggests that Cambridge customers are interested in purchasing more value added and premium priced products such as prepared/ready to eat foods and organics (p.29).

Total sales at the Cambridge Farmers' Market were conservatively estimated at 1.5 million dollars in 1998 (p.32). The average number of people working at the Market on any given day, including Market managers, vendors and assistants, was estimated at 54 people (p.34).

Kitchener Farmers' Market

In November 2002, two customer counts revealed that the number of people visiting the Kitchener Farmers' Market ranged from 9,691 people to 13,429 people (Adventus Research, 2002. p.3). As was found with the Cambridge Market, Kitchener Market customers are loyal. Just over 60% of Kitchener Market customers noted that they shop weekly at the Market (p.3).

A considerable portion of the Kitchener Market's customer base, 18%, relies on the Market for more than 50% of their total food needs while close to a third of all customers purchase between 25% and 50% of their food needs at the Kitchener Market. Approximately half of the customers use the Kitchener Market for less than 25% of their food needs (p.3). Given the large number of customers that are currently purchasing more than half of their food needs at the market, there may be opportunities to increase Market sales among customers that are purchasing less than 50% of their food needs at the Market.

Kitchener Market customers cited food freshness as the most liked or appreciated features of the market (p.4). Food quality and variety were also identified as important attractions (p.10) and shoppers indicated an interest in seeing more space devoted to organic and health foods and ethnic foods (p.4).

The Kitchener Farmers' Market features over 70 vendors during the year. Approximately 40% of Kitchener Market vendors reported that the average sale per transaction is between $6 and $10 while a further 36% of vendors reported an average sale amount of $1 to $5. Estimated total sales at the Kitchener Farmers' Market amount to $6.8 to $7.6 million (p.7). Twenty-five percent of Market vendors reported annual sales between $50,000 and $100,000 while 42% of vendors reported that they sell less than $50,000 annually at the Kitchener Market (p.7).

Total annual sales at the Kitchener Farmers' Market are estimated at just over $7 million. The estimated market share of Kitchener Farmers' Market as a percentage of all dollars spent in Kitchener on food weekly, is 2.7% (p.9). In terms of market share based on dollars spent on food in Kitchener on Saturdays, it's estimated that the Kitchener Farmers' Market has a 12% market share (p.9).

Waterloo County and St. Jacobs Farmers' Markets

The St. Jacobs Farmers' and Flea Market and the Waterloo Farmers' Market are located in close proximity to one another and offer a wide selection of fresh produce, meat, cheese, and baked goods from local growers and producers from across Ontario. The St. Jacobs Market features over 400 vendors. This includes old order Mennonites who sell freshly baked bread, pies, cookies, summer sausage, apple butter, maple syrup and seasonal produce including fresh strawberries, sweet corn and watermelons.

The two markets receive as many as 20,000 visitors per week (Personal communication with Ross Shantz, June 9, 2003). Based on average consumer expenditure data for Farmers' Markets in Ontario,[25] total annual food related sales at the St. Jacobs and Waterloo Markets are conservatively estimated at $10 to $15 million.

4.4.4 Food Stores

Supermarkets

Supermarket chains[26] account for approximately half of retail food sales in Canada (Wen, 2001, p.4). Although there is no formal taxonomy for the various food retailers, supermarkets are generally characterized as stores with over 15,000 square feet of selling space, featuring very diverse products for sale, and located within a 15 minute drive from the clientele (Wen. 2001. p.4).

The average supermarket in Canada stocks as many as 17,857 types of products (Stock Keeping Units). In Ontario and Quebec this figure is closer to 24,000 products and in the US the average is 36,426 products (Canadian Grocer, Executive Report.

[25] Average consumer expenditure at Ontario Farmers' Markets amounts to $15 to $20 per visit (Cummings et al. 1998).

[26] The definition of a "chain" used by Statistics Canada is an enterprise with more than four stores, which is assumed to confer on it certain advantages in wholesaling, warehousing, advertising, and the use of electronic technology, compared to independent retailers.

1999). In 1998, Statistics Canada reported the national average sales per square foot of chain supermarkets at $607 (Wen. p.13). The average sales per customer transaction amounted to $24.40 while the average price per item amounted to $1.96 (Canadian Grocer. 1999). Average total sales per supermarket[27] amounted to approximately $15 million in 1998 (Wen. p.11-12).

Waterloo Region features at least 25 supermarkets that are associated with the major supermarket chains in Canada. This includes 13 Zehr's Markets, 5 Food Basics, 5 Sobeys, and 2 Price Chopper stores, all located in Kitchener, Waterloo and Cambridge (Table 4.3). Smaller communities throughout Waterloo Region including St. Clements, New Hamburg, Wellesley, New Dundee and Elmira are serviced by a variety of Grocery Store chains including Knechtel's, Dutch Boy, Commisso's and Foodland.

A conservative estimate of total supermarket sales for Waterloo Region can be derived by applying the national sales average for supermarkets to the approximately 35 supermarkets in Waterloo Region. This provides an estimate of $525 million in total supermarket sales for Waterloo Region. This appears to be a reasonable estimate considering our overall estimate of $829 million in total food purchases from stores by local households in 2001 (see Household Expenditure data as presented at the end of this section of the report).

Most of the purchasing decisions for supermarket chain stores are done by the head office. Chain stores typically have their own wholesalers and distributors and local managers of corporate stores have little opportunity to buy locally. Sobeys for example is rationalizing its Ontario distribution system by promoting delivery through central warehouses rather than direct store delivery from manufacturers and producers. The move is seen as a necessary strategy to "increase efficiency in the distribution system and provide higher service levels at reduced costs to storeowners." (Community Grocer, Dec. 1999). Other issues that pose challenges to direct store delivery include food security and traceability issues.

[27] Based on a total of 3,582 supermarket chain and independent stores with total sales of $53.5 billion in 1998.

Table 4.3 Location of Chain Supermarkets in Kitchener, Waterloo and Cambridge

Store Name	Address	City
Food Basics	851 Fischer-Hallman Rd	Kitchener
Food Basics	370 Highland Rd W	Kitchener
Food Basics	1405 Ottawa St N	Kitchener
Food Basics	100 Jamieson Pky	Cambridge
Food Basics	95 Water St N	Cambridge
Price Chopper	720 Westmount Rd E	Kitchener
Price Chopper	425 University Ave E	Waterloo
Sobeys	585 Weber St N	Waterloo
Sobeys	274 Highland Rd W	Kitchener
Sobeys	94 Bridgeport Rd E	Waterloo
Sobeys	450 Columbia Rd	Waterloo
Sobeys	130 Cedar St	Cambridge
Zehrs Market	1005 Ottawa St N	Kitchener
Zehrs Market	1375 Weber St E	Kitchener
Zehrs Market	200 Franklin Blvd	Cambridge
Zehrs Market	875 Highland Rd W	Kitchener
Zehrs Market	123 Pioneer Dr	Kitchener
Zehrs Market	450 Erb St W	Waterloo
Zehrs Market	315 Lincoln Dr	Waterloo
Zehrs Market	550 King St N	Waterloo
Zehrs Market	385 Frederick St	Kitchener
Zehrs Market	180 Holiday Inn Dr	Cambridge
Zehrs Market	1565 King St	Cambridge
Zehrs Market	400 Conestoga Blvd	Cambridge
Zehrs Market	Waterloo Square	Waterloo

Source: Adapted from list of stores provided by Waterloo Region Health Department.

Specialty Food Stores

The specialty food retailer serves a niche market, offering select clientele a line of unique specialty products such as gourmet foods, ethnic foods, natural foods, or the unusual and hard to find. Specialty food products can be classified into two broad categories. The first is gift food which is usually higher priced and nicely packaged. The second is daily use. These are specialty foods with an emphasis on taste and quality.

According to a recent survey of 22 'ethnic retail stores' in Waterloo Region, local products account for a fairly small portion of total sales. While almost all of the stores reported featuring at least one locally grown or produced product, the average of the estimated proportion of total sales from local products was calculated at 6.4% (Fuller, 2003).

Retailers identified a number of barriers associated with selling/promoting locally grown products. The main barrier identified was the lack of familiarity with local products and producers. Most of the retailers indicated an interest in learning more about the types of

local products that are available and suggested they would be receptive to being approached by producers. However, some retailers indicated that their only interest is in selling "foreign products" which are often only available via Toronto or directly from country of origin. Some retailers indicated that customers come to the store specifically to buy imported goods and/or products from "back home."

As was found with convenience stores, specialty stores reported that they were constrained by the limited availability of display space for local produce. They also noted that producers would need to adhere to health and food safety standards and offer products that are competitively priced with products being brought in from Toronto. Retailers mentioned different products that they are currently importing or bringing in from other parts of Canada that could potentially be produced locally. Examples of these products include pita bread, beef, squash/pumpkin, celery, onions, and certain types of cheeses.

Retailers offered several suggestions to help promote the introduction of local products into specialty stores. One retailer suggested that a central location be designated and promoted where retailers could easily obtain current information regarding the availability of local products. Another retailer suggested that there should be an annual festival that highlights various locally grown or produced products in order to raise awareness about what is available in the area.

Convenience Stores

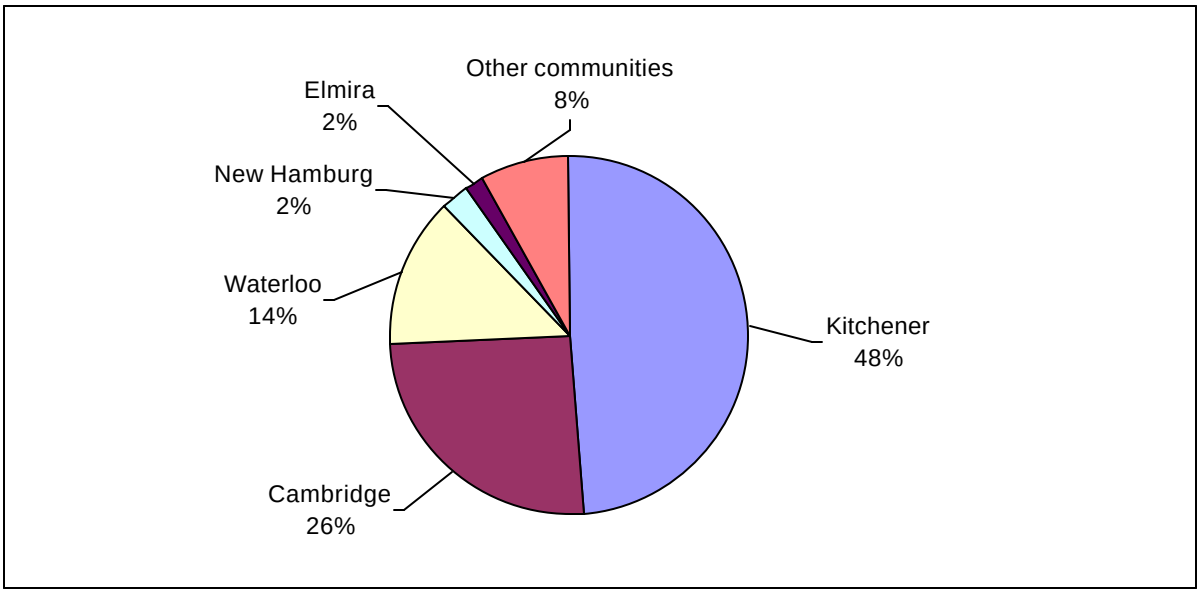
Grocery convenience stores offer a limited variety of merchandise with the convenience of neighborhood locations, fast checkouts and extended hours of operation. The competitive edge for convenience stores is convenience, service and more locations than supermarkets.

Waterloo Region features approximately 250 grocery convenience stores.[28] Several convenience chains have a large number of stores in Waterloo Region including Little Short Stop (29 stores), Farahs Food Mart (15), and Becker's (8). Waterloo Region also features a number of convenience chains with 5 or fewer stores including Mac's Milk, Big Bear Food Mart, 7-Eleven, Daisy Mart, Stop 2 Shop, and Winks. Approximately 1/3 of all convenience stores in Waterloo Region are independent - rather than chain stores - which is consistent with the provincial profile (OMAF. Annual Food Store Statistics, Ontario. 2002).

Close to half of all convenience stores in Waterloo Region are located in Kitchener while just over 25% are located in Cambridge. Approximately 14% are located in the City of Waterloo while the remaining 12% are distributed across 17 smaller urban centres in Waterloo Region (Figure 4.1).

[28] This does not include gas stations that feature convenience stores.

Figure 4.1 Location of Convenience Stores in Waterloo Region



Source: Adapted from list of stores provided by Waterloo Region Health Department.

From the survey work that was completed with 17 convenience stores, most store managers indicated that they were not selling locally produced food products while several others noted that they were unsure whether any of their food products were grown or processed within Waterloo Region. Only two stores reported selling locally produced food items which consisted of seasonal fruits and vegetables, cheese, and meat products.

Store managers identified several factors that are restricting their ability to sell and promote local products. Many of the chain convenience stores make their purchases through central distributors (similar to supermarkets) and have little influence over what food products come through this channel. Store managers also suggested that they would not be able to compete with supermarkets on price, variety and supply of fresh produce. Another constraint is the limited availability of display space in many convenience stores and the costs associated with installing additional refrigerated display cases. Some store managers questioned if the returns on investment would be sufficient.

However, a number of suggestions were offered for enhancing availability and sales of local food products. Store managers would like to see more information on where local products could be purchased and the process for purchasing directly from producers. One manager suggested that a sales representative for local producers could visit stores and educate/inform managers about the variety of food products available locally, how to link with farmers, and how to market local foods. Several managers noted that more advertising could be developed to increase public awareness about the availability of locally produced foods.

Employment in Supermarkets, Specialty Food Stores and Convenience Stores

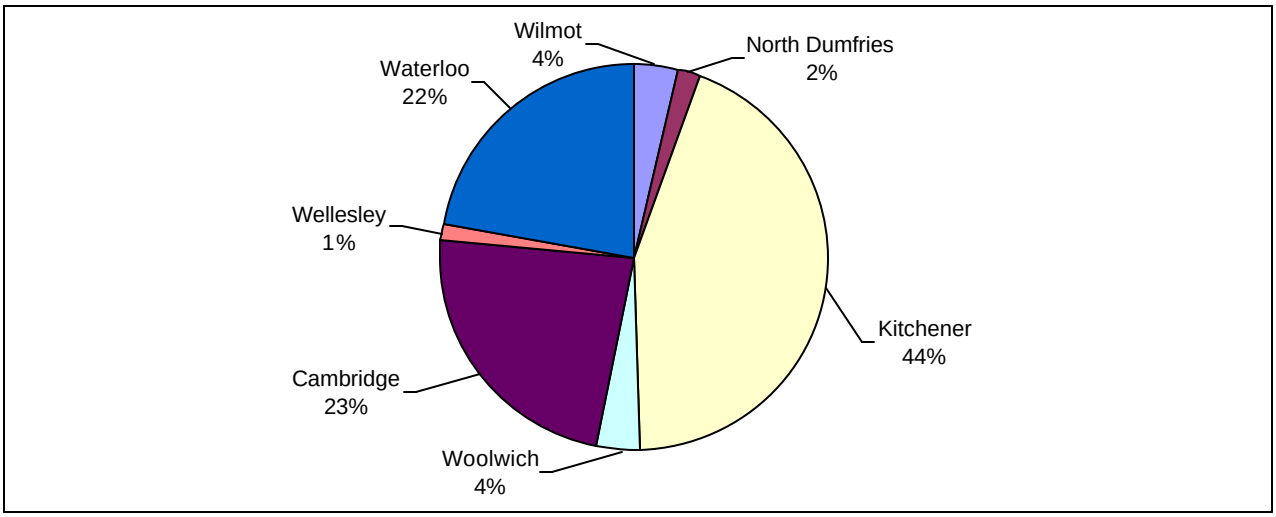
Supermarkets, convenience stores and specialty food stores[29] in Waterloo Region employed a total of 5,585 people in 2001. This represents 22.5% of all Retail Trade sector jobs (Table 4.4) or 2.4% of the total workforce in Waterloo Region. As shown in Figure 4.2, the City of Kitchener accounts for 44% of all jobs in the Grocery Store sector followed by Cambridge at 23% and Waterloo at 22%.

Table 4.4 Employment in the Grocery Store Sector in Waterloo Region, 2001

	Waterloo Region	North Dumfries	Cambridge	Kitchener	Waterloo	Wilmot	Wellesley	Woolwich
Total Retail Trade	24,875	460	6,115	11,295	4,935	815	340	920
Supermarkets and Convenience Stores	5,075	90	1,205	2,180	1,185	185	55	185
Specialty Food Stores	510	15	105	275	65	20	15	20
Total Grocery Stores	5,585	105	1,310	2,455	1,250	205	70	205

Source: Statistics Canada, 2001.

Figure 4.2 Share of Total Employment in the Grocery Store Sector by Municipality, 2001



Source: Statistics Canada, 2001.

[29] NAICS includes 'Supermarkets', Convenience Stores', and 'Specialty Food Stores' under the general heading 'Grocery Stores'. Definitions for each store type are provided in Chapter 3 of this report.

Household Expenditures and Consumer Expenditures in Supermarkets, Specialty Food Stores and Convenience Stores

Households in Ontario spent an average of $64,370 in 2001 on total household expenditures (Statistics Canada, 2001 Survey of Household Spending).[30] This was up 2.6% from $62,740 in 2000, consistent with the rate of inflation of 2.6% as measured by the Consumer Price Index.

The four largest spending categories in 2001 were personal taxes, shelter, transportation and food. Personal taxes claimed 21.8% ($14,026) of the average Ontario household budget while shelter related expenses[31] claimed 20% ($12,863) of the average household budget. Spending on transportation claimed 13.2% ($8,515) and food[32] claimed 10.4% ($6,709) of the average household budget.

An estimate of consumer expenditures in supermarkets, specialty food stores and convenience stores in Waterloo Region was derived from provincial average household expenditure data. Given that each Ontario household spent approximately $5,144 on food purchased from food stores in 2001 (Statistics Canada, 2001 Survey of Household Spending), it is estimated that Waterloo Region households spent approximately $829 million (161,130[33] households x $5,144/household) in food stores in 2001. Expenditures in food stores made up approximately 77% of total food expenditures.

Table 4.5 shows the estimated total weekly expenditure on different store bought foods per Ontario household in 2001. Meat products made up the single largest percentage of weekly food expenditure at 21% followed by dairy and egg products at 15% and bakery and other cereal products at 15%. Fruits and vegetables combined account for 22% of the weekly household food expenditure through stores in 2001.

[30] Statistics Canada's Survey of Household Spending tracks expenditures by households only. It does not include government, business or foreign tourist spending on foodservice. Household expenditures include food, shelter, clothing, household furnishings and equipment, transportation, health and personal care, reading materials, recreation, education, insurance, tobacco and alcohol, games of chance (net amount), personal income taxes, gifts of money, and other household expenditures.

[31] Includes utilities, repairs and property taxes.

[32] Includes food purchased from stores and restaurants. Restaurants include drive-ins, canteens, cafeterias, and take-outs.

[33] Includes households containing a couple with children, a couple without children, one-person households and other household types.

Table 4.5 Estimated Total Annual Food Expenditure on Store Bought Food for Waterloo Region

	Average percentage of Ontario household income spent on store bought food by food category, 2001 [b]	Estimated total annual expenditure on store bought food by food category for Waterloo Region [c]
Total food purchased from stores [a]	100%	$829,000,000
Meat	21.5%	$178,235,000
Dairy products and eggs	14.8%	$122,692,000
Bakery and other cereal products	14.6%	$121,034,000
Fruits and nuts	12.3%	$101,967,000
Vegetables	10.4%	$86,216,000
Other food materials and food preparations	9.5%	$78,755,000
Non-alcoholic beverages	4.3%	$35,647,000
Fish and other marine products	3.7%	$30,673,000
Sugar and sugar preparations	3.4%	$28,186,000
Condiments, spices and vinegar	2.8%	$23,212,000
Coffee and tea	1.6%	$13,264,000
Fats and oils	1.1%	$9,119,000

[a] Food purchased locally and on day trips. Does not include food purchased from stores while on trips overnight or longer.
[b] Adapted from Statistics Canada, Income Statistics Division, Catalogue No. 62-554-XIE. February 2003.
[c] Estimates for each food category are based on are based on estimate of total store bought purchases for all Waterloo Region households as derived from Statistics Canada, 2001 Survey of Household Spending.

4.4.5 Food Services

Employment in Food Services

Full-service restaurants,[34] limited-service eating places,[35] and special food services[36] in Waterloo Region employed a total of 10,680 people in 2001. This represents 86% of all Accommodation and Food Services sector jobs (Table 4.6) or 4.6% of the total workforce in Waterloo Region. Approximately half of the jobs in the food service sector are related to limited-service eating places such as fast-food restaurants and coffee shops while 45% of the jobs sector are associated with full-service restaurants.

[34] Full-Service Restaurants includes establishments primarily engaged in providing food services to patrons who order and served while seated and pay after eating. These establishments may sell alcoholic beverages, provide take out services, operate a bar or present live entertainment in addition to serving food and beverages. NAICS 2002.
[35] Limited-Service Eating Places includes establishments primarily engaged in providing food services to patrons who order or select items at a counter, food bar or cafeteria line (or order by telephone) and pay before eating. Included in this category are public cafeterias, coffee shops, doughnut shops, drive-in restaurants, fast-food restaurants, and sandwich shops. NAICS 2002.
[36] Special Food Services includes establishments primarily engaged in providing food services art the customer location, at a location designated by the customer, or from a motorized vehicle or non-motorized cart. Included in this category are food service contractors (industrial cafeterias or caterers, school cafeterias), caterers, and mobile food services (mobile canteens, snack trucks, street vendors, etc.). NAICS 2002.

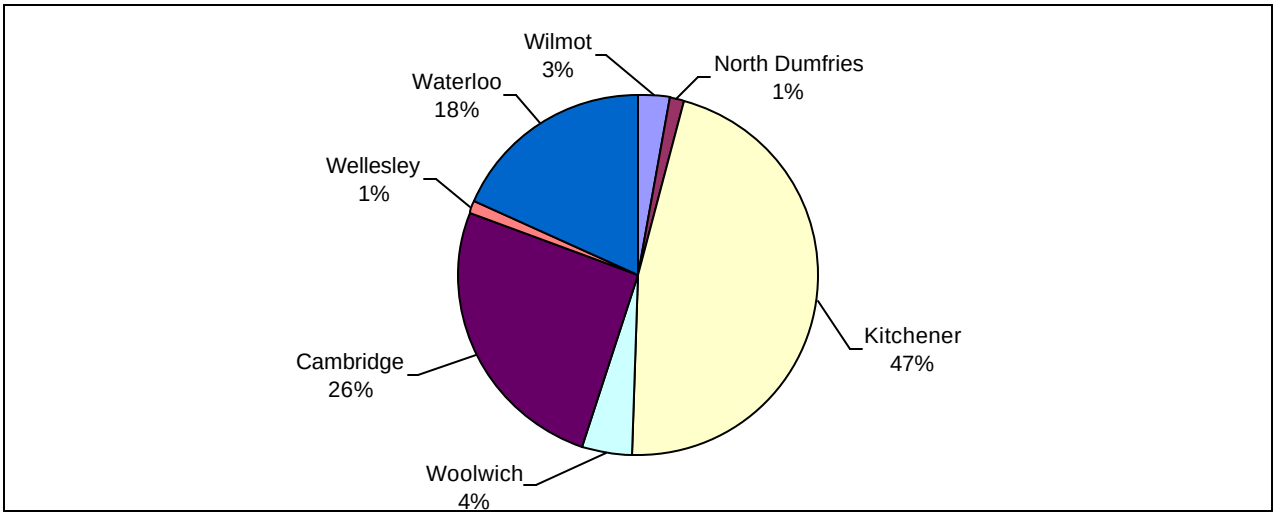
As shown in Figure 4.3, the City of Kitchener accounts for almost half of all jobs in the Food Services sector followed by Cambridge at 26% and Waterloo at 18%. The City of Kitchener has twice as many people employed in Food Services sector as Cambridge and Waterloo combined.

Table 4.6 Employment in the Food Service Sector in Waterloo Region, 2001

	Waterloo Region	North Dumfries	Cambridge	Kitchener	Waterloo	Wilmot	Wellesley	Woolwich
Total Accommodation & Food Services	12,435	155	3,100	5,755	2,350	395	140	535
Full-Service Restaurants	4,800	50	1,155	2,200	905	120	60	310
Limited-Service Eating Places	5,220	85	1,490	2,360	945	175	35	130
Special Food Services	660	10	100	390	120	15	0	30
Total Food Services [a]	10,680	145	2,745	4,950	1,970	310	95	470

[a] Does not include Drinking Places (Alcoholic Beverages).
Source: Statistics Canada, 2001.

Figure 4.3 Percentage of Total Employment in the Food Service Sector by Municipality, 2001



Source: Statistics Canada, 2001.

Consumer Expenditures in Food Services

As was the case with consumer expenditures in food stores, an estimate of consumer expenditures in food services in Waterloo Region was derived from provincial average household expenditure data. As each Ontario household spent approximately $1,538 on food service meals in 2001 (Statistics Canada, 2001 Survey of Household Spending), it is estimated that Waterloo Region households spent approximately $248

million (161,130[37] households x $1,538/household) on food service meals in 2001. Expenditures on food service meals made up approximately 23% of total food expenditures.

4.4.6 Emergency Food Aid Programs

The Food Bank of Waterloo Region was established in 1984. It is based on a warehouse model and annually receives over 6 million pounds of food donations (worth approximately $12 million) from citizens, manufacturers, wholesalers and distributors, food stores and farmers. Approximately half of this food is distributed to 57 different programs (local food banks, soup kitchens, shelters, hostels, etc) within Waterloo Region. The remainder is shared with the provincial and national food bank programs. House of Friendship, which provides food aid to18,000 Kitchener-Waterloo residences annually (1/3 of which are 12 or under), is the largest local distributor of food to the needy. Other similar organizations include Woolwich Community Services and Wilmot Community Services. The Cambridge Self Help Food Bank operates independently from the Food Bank of Waterloo Region. The Saint Vincent De Paul Society and the Salvation Army are also active in providing emergency food aid. Many local organizations receive food from local donations as well as the regional bank. In addition to major contributions of time by generous volunteers, staff of the regional bank estimate that over 100 full time equivalent positions are involved in conveying food to the needy in Waterloo Region.

A number of emergency food aid programs are also actively involved in supporting local community gardens. While community gardens cater to a variety of community interests, they do provide an opportunity for needy individuals and families to meet at least part of their food needs through their own efforts. The Waterloo Region Community Gardening Network is commended for its efforts in promoting community gardens. Continued support should be provided to the Network and to existing and proposed community gardens.

[37] Includes households containing a couple with children, a couple without children, one-person households and other household types.

4.5 Summary

Characteristics and trends for the tertiary sector in Waterloo Region, include the following:

- Waterloo Region features approximately 35 supermarkets and over 250 convenience stores. The majority of these grocery stores are located in the cities of Cambridge, Kitchener and Waterloo.

- Waterloo Region households spent a total of $1.08 billion on food in 2001.
  - $829 million (77%) of total food expenditures went toward store purchases
  - $248 million (23%) was spent on restaurant and food service meals.

- Supermarkets, convenience stores and specialty food stores in Waterloo Region employed a total of 5,585 people in 2001 while food services employed a total of 10,680 people.

- In many cases the availability of local products in supermarkets and convenience stores is contingent on the purchasing decisions made by the head offices of supermarket and convenience chain stores. Supermarket chain stores are increasingly moving toward centralized distribution centres to increase efficiency in the distribution system and in the process reducing or eliminating 'back-door' deliveries from local producers.

- A survey of local convenience store managers suggests that sales of locally produced products are minimal. Convenience stores identified constraints associated with limited floor space and ability to compete with supermarkets on price, variety and supply.

- Mennonite and non-Mennonite farmers in Waterloo Region are using a variety of direct selling techniques including on-farm marketing and farmers' markets.

- Some farms in Waterloo Region are deriving over 50% of their total farm receipts from direct sales.

- Waterloo Region features four of the pre-eminent farmers' markets in Ontario. Farmers' markets in Ontario are experiencing a resurgence in popularity as consumers increasingly look for an alternative shopping experience. Food freshness is seen as the most important attraction at local farmers' markets. Consumers spend over $20 million annually at farmers' markets in Waterloo Region.

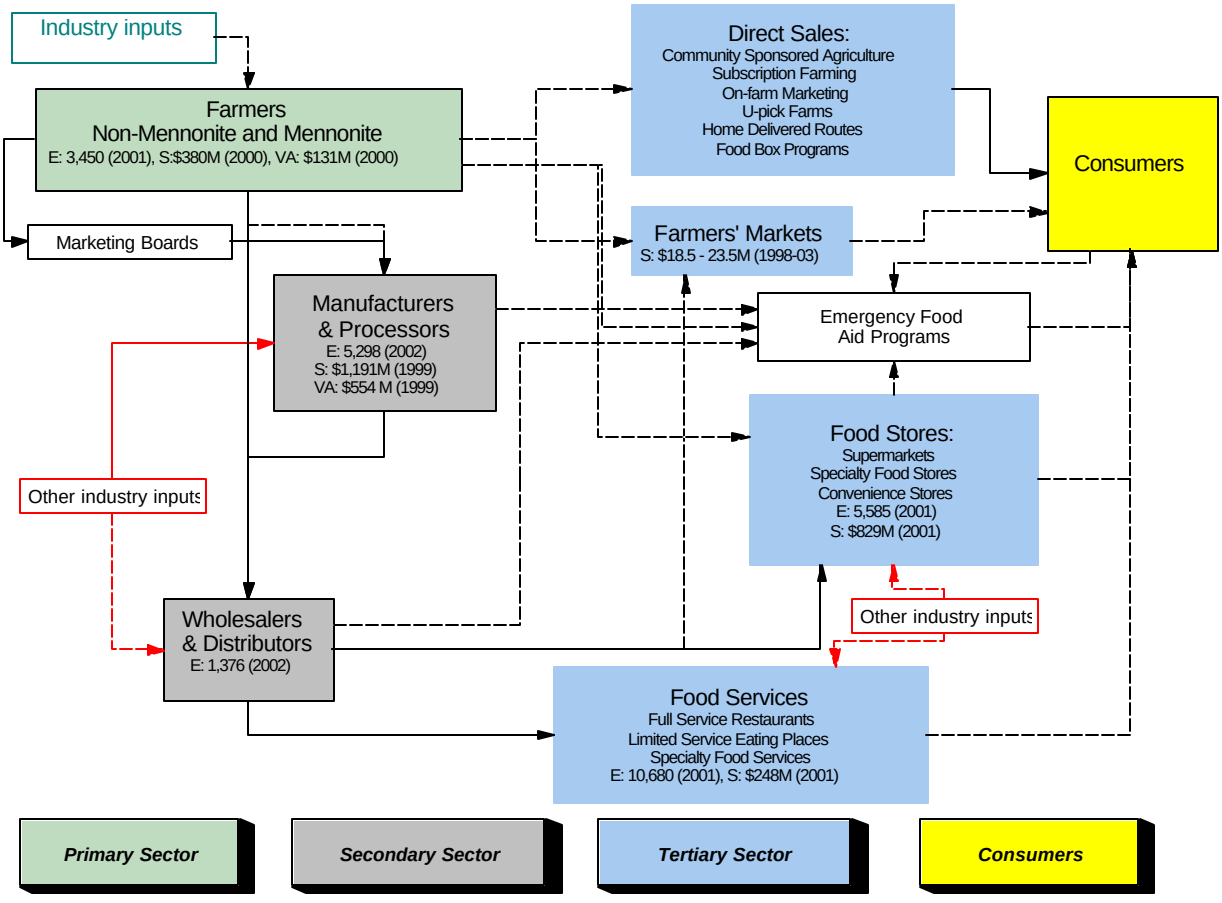
5.0 Waterloo Region Food Economy – Themes for Further Consideration

Chapter 1 introduced a generalized model of the Waterloo Region Food System. Chapters 2, 3 and 4 described the methodology used and the findings/observations for the three key sectors of the model – primary, secondary and tertiary. This chapter draws on those findings/observations and the Literature Review in Appendix A to present a more detailed model of the Waterloo Region Food Economy, an overview of the economic importance of the three sectors taken as a whole and a discussion of key cross-sectoral themes and matters meriting further consideration.

5.1 Detailed Waterloo Region Food Economy Model

Figure 5.1 adds employment, sales, and value added figures to the generalized model introduced in Chapter 1. While not all figures were available due to confidentiality and similar issues, the expanded model provides a useful snapshot of the relative economic importance of different components of the system as measured in dollars and jobs.

Figure 5.1 Waterloo Region Food Economy Model



Note: E = Employment, S = Sales, VA = Value Added

5.2 Economic Importance of the Three Sectors Combined - Employment, Sales and Value Added

Taken as a group, the primary, secondary and tertiary sectors support over 26,380 food related jobs (2001/2002) or approximately 11.3% of Waterloo Region's labour force. The significance of the food industry contribution to regional employment is further demonstrated when one considers that the primary sector alone employs 3,450 in comparison to computer and electronic manufacturing, which employs 4,120.

Gross sales estimates for the primary sector ($380M in 2000), manufacturers and processors ($1,191M in 1999), farmers' markets ($21M in 2003), food stores ($829M in 2001) and food services ($248M in 2001) total almost $2.7 billion. If the sales associated with Wholesalers, Distributors, Warehousing/Storage and Agents/Brokers were factored in this figure would be even larger.

The value added component is substantial. Value added is the difference between a good's final value and the value of the other items that went into producing it. Each step in the value added chain uses capital and labour to create employment. Consequently, the more 'value' that is added to a product before final sale or export, the more benefits provided to the local economy. While one of the best measures of economic contribution, value added figures were only available for the primary sector ($131M in 2000) and for the food-related manufacturing and processing sector ($554M in 1999).

5.3 Discussion of Key Cross-Sectoral Themes

From the preceding Chapters and the Literature Review in Appendix A, a number of themes emerge which are cross-sectoral in nature. This section identifies these themes, discusses some of their implications and speaks to opportunities they present.

5.3.1 Complexity of the Waterloo Region Food System

While Figure 5.1 Waterloo Region Food Economy Model is useful in understanding key linkages in, and the approximate size of key sectors of the Waterloo Region Food System, it does not reflect the overall complexity of the system. The system is really a multitude of interconnected loops with each sector being impacted by a host of inputs and outputs which in turn change the inputs and outputs of the other sectors in the system. The system is not a closed system, in addition to changes experienced within Waterloo Region it is also impacted by change occurring elsewhere in the province, country and the world. Evidence of this can be seen in the effects of a world wide embargo placed on Canadian beef as the result of a single case of bovine spongiform encephalopathy (BSE or mad cow disease) in Alberta. Although regional figures are unavailable, Ontario's 21,000 beef producers were estimated to be losing about $4 million per week during the BSE situation (Ontario Cattlemen's Association, September 2, 2003).

To gain an understanding of this complexity, a variety of methods are needed. Data from Statistics Canada, local directories and sector surveys are useful in generating needed information. Confidentiality issues and the timeliness of data pose some limitations to the Statistics Canada data. Different categorization approaches also pose a problem. The unique nature of the Mennonite community poses some interesting challenges in trying to get a complete measure of their involvement. Identifying the local component of the farm to manufacturer/retailer food system and measuring its value is also a challenge.

This study should be viewed as an initial perspective on the local food system. Consideration should be given to additional work which will add to this base.

5.3.2 Unique Aspects of Waterloo Food System

In general, the agri-food economy - farming, food manufacturing and food retailing - plays a more important role in Waterloo Region than in the average region in Ontario. The following are some of the more unique aspects of the Waterloo system.

Farm Characteristics

There were 1,444 farms in Waterloo Region in 2001 compared to 1,590 farms in 1996.[39] While the number of farms in the region is declining, the rate of decline is slower than the provincial average. The total area of farmland in Waterloo Region also declined during this period although at a faster rate than the provincial average. Between 1996 and 2001 the area of farmland in Waterloo Region declined by 3.7% from 234,400 acres to 225,800 acres.[40]

Farms in Waterloo Region are smaller than the provincial average. In 2001 the average farm size in Waterloo Region was 156 acres compared to 226 acres for the province. This difference is largely explained by the concentration of livestock farms in Waterloo Region, particularly dairy and beef farms, which are on average smaller than field crop type farms. In 2001, livestock farms accounted for 66% of all farms in Waterloo Region in comparison to the province where livestock farms accounted 45% of all farms.

Dairy farms are the most numerous type of farm in Waterloo Region followed closely by beef farms. Between 1996 and 2001 the number of dairy farms in Waterloo Region increased from 256 farms to 296. During the same period the number of beef farms remained constant at 289 farms. The increase in dairy farms represents an important trend especially in light of the significant decline in dairy farms across Ontario. Waterloo Region now ranks as the 6th largest milk producing region in Ontario and production is continuing to increase. Although dairy and beef farms combined account for 42% of all

[39] Statistics Canada defines a census farm as an agricultural operation that produces products such as livestock, poultry, animal products, crops or other agricultural products intended for sale. A more detailed definition is provided in Section 2.

[40] Statistics Canada associates the following land uses with farmland: land in crops, land in pasture, land occupied by farm buildings and yards, land used for other farm-related activities such as farm woodlots.

farms in Waterloo Region, a variety of other farm types including hog, poultry, field crop, vegetables, fruit and specialty products account for the balance of farms in the region and promote a diverse rural economy.

Waterloo Region has one of the most economically productive land bases in the country with all municipalities exceeding the average in terms of farm gate sales per acre. The provincial average sales was $675 per acre while Waterloo Region had average sales of $1,681 per acre, the second highest level of productivity on a per acre basis in Ontario, exceeded only by the Niagara Region fruit belt. On average, net revenue per farm at $39,000 was almost twice the Ontario average of $21,534 in 2000. The high level of productivity per acre is directly related to the focus on livestock in Waterloo Region.

The average age of farm operators in Waterloo Region is 46 compared to 51 in the province. This reflects a younger, more vibrant agricultural base for Waterloo Region.

The young, vibrant and highly productive agriculture sector reflects a significant local opportunity for Waterloo Region. This relates to local manufacturing and direct retail sales in particular. There could also be significant opportunities for local people to enhance the quality of the food they eat by improving the retail-manufacturing-farm sector links.

While not unique to Waterloo Region, the presence of a sizeable Mennonite community introduces an interesting dimension to the local food economy.

Concentrations in Food Processing

The meat processing and bakery sub-sectors make up over half of Waterloo Region's food-related industries and 65% of its food-related industries' employment. Waterloo Region's food-related companies are concentrated in Kitchener. Comparison of Waterloo Region's human food, meat product and bakeries and tortilla manufacturing sectors to the Province shows that the region is specialized in these sectors, particularly in meat product manufacturing.

Farmers' Markets

Waterloo Region features four Farmers' Markets that offer consumers a personal connection with local food producers. Food freshness is seen as the most important attraction at local Farmers' Markets. There is also growing interest in organics and ready to eat products. Consumers spend over $20 million annually at Farmers' Markets in Waterloo Region. The region is famous nationally and internationally for its Farmers' Markets and they serve both local needs and as day trip destinations. While each of the existing Farmers' Markets has a loyal customer base, long-term viability is tied to maintaining and adding to the customer base. Market displays and advertising represent one approach to promoting local producers and products. With a variety of related special events such as the Elmira Maple Syrup Festival, Wellesley Apple Butter

and Cheese Festival and Oktoberfest occurring on a regular basis, opportunities exist to promote both a market visit and participation in a special event as part of the same outing.

5.3.3 Economic Pressures and Productivity Improvements

All three sectors are striving to improve productivity, to keep costs in check and to maximize profits. Farmers, in moving to address lower per unit returns, are increasing the size of their operations and using greater mechanisation. There were 3,450 jobs in farming and closely related activities in Waterloo Region 2001. This was a decline of 875 jobs from 1996 and reflects the move to more capital intensive agriculture. Food processors are becoming increasingly automated and are consolidating where appropriate. Food stores are consolidating, introducing a variety of new store formats, adopting electronic approaches, revising business practices and introducing home-meal replacements to remain competitive. Food services are adopting new technology and business practices. Computer software and labour saving equipment are being used extensively across all sectors.

Notwithstanding this effort, total value added/employee in Waterloo Region's food processors is lagging behind that of the Province except for meat product manufacturing. While wage rates and salaries are lower in Waterloo Region then the Province for the human food manufacturing cluster and meat product manufacturing, they are higher for bakeries and tortilla manufacturing. This suggests that there is further room for productivity improvement, particularly in the secondary sector. Consideration should be given to helping local primary producers and food processors learn new approaches and access new sources of capital that would help them improve productivity.

5.3.4 Improving Local Links

Increasingly our food production, manufacturing and sales systems are disconnected from the local economy. The average distance traveled by truck to deliver food has increased over the years resulting in growing environmental costs. Manufacturing facilities have become larger and more centralized. Most purchasing decisions for supermarket chains are made in head office and delivered through centrally located company controlled distribution systems. Local managers of corporate stores have little opportunity to buy locally. Similarly, few food service operations in Waterloo Region currently purchase directly from producers. This poses a major challenge to local producers, particularly small scale producers, in getting their products onto local store shelves and food service menus.

To address this challenge, producers are using a variety of direct selling techniques - including farmers' markets, community supported agriculture farms, subscription farming, commercial direct marketing, on-farm marketing, u-pick farms, and home delivered routes. While not a panacea for all, the survey data presented in this report indicates that some farms in Waterloo Region are deriving over 50% of their total farm

receipts from direct sales. Opportunities for improving direct linkages between farmers and consumers in Waterloo Region have increased in recent years through the efforts of the Buy Local Working Group and the introduction of the "Buy Local! Buy Fresh!" map.

The Buy Local Working Group, is a sub-committee of Foodlink Waterloo Region. Foodlink Waterloo Region is a non-profit organization that works to link farmers with citizens to create a sustainable food system in Waterloo Region. In working to promote local agriculture and enhance interaction between the farming community and consumers, Foodlink supports a number of activities such as research and promotional campaigns including the Buy Local! Buy Fresh! Map. The map was developed with stakeholder consultations and serves as a marketing tool that introduces local consumers to Waterloo Region farmers and the products they market directly off the farm. The Region of Waterloo Public Health Department has been instrumental in supporting the development of Foodlink as an organization. Support for the organization is linked to the Department's commitment to community food security. As noted in a Community Health Department briefing from July 2002, "Community food security exists, in part, when we have the capacity to grow nutritious food in a sustainable way that adequately compensates farms." (Report # CH-02-057).

Beyond the "Buy Local! Buy Fresh!" campaign, stakeholders may also want to consider other possible approaches to improving local links. The creation of a local food terminal or distribution system which pools the outputs of a number of small producers would be one approach. Another option is to expand local educational and marketing material to reach out to markets such as restaurants, hospitals, educational institutions, seniors homes and other institutional food services.

While this study did not explore the link between local production and local processing in any detail, comments raised by a number of producers suggested that opportunities existed for improved links with local processors. Consideration should be given to exploring some of these links in subsequent research.

5.3.5 Need for Better Information, Research and Training

All three sectors are experiencing ongoing change and as a result need useful and timely information if they are to successfully adapt to changing conditions. The farm economy, in particular, is in a state of flux and farmers are scrambling to adjust to changing circumstances.

At the same time consumers are increasingly demanding that producers, processors and distributors offer foods with more taste, greater variety and more nutritional value (Toronto Food Policy Council, 1995). Associated with this is the growing market for products of local farmers and a greater desire to purchase foods from the region where people live (Cummings et al, 1999; Toronto Food Policy Council, 1995). As well, the market for new foods processed in different ways is expanding in conjunction with rapid

changes in the ethno-cultural mix of the Ontario population (Toronto Food Policy Council, 1995).

As some producers find it difficult to change quickly, fresh approaches would be helpful for those who are struggling to gain the information they need to move forward. This could include creative approaches such as mentoring, web based tools, marketing assistance, research links with nearby universities and custom training programs to meet specific needs.

5.3.6 Changes in Consumer Behaviour

While a host of consumer actions impact on the food system, the following national trends as identified by Statistics Canada (Food Consumption Highlights, 2002) and other sources are particularly significant for the Waterloo Region agri-food economy:

- **decline in per capita consumption of red meat** - given the importance of livestock production and meat processing in the Waterloo Region food economy, the decline in consumption of red meat raises concerns regarding the long term prospects of these two activities. Farmers, processors and other industry stakeholders may have to work more closely to ensure that the sector remains as competitive as possible. This could involve finding new markets for red meat products and exploring ethnic and other niche markets.

- **increase in per capita consumption of poultry** - the increased demand in poultry production may offer opportunities for both new producers and processors and for existing producers and processors who may be negatively impacted by the reduction in red meat consumption.

- **increase in per capita consumption of fruit and vegetables** – relatively few farms in Waterloo Region derive the majority of their total farm income from fruit and vegetable production (8 fruit farms and 15 vegetable farms in 2001). However, there are a considerable number of mixed farming operations in Waterloo Region that derive some of their total revenue from growing fruits and/or vegetables. As consumers include more fruits and vegetables in their diets there may be opportunities for new and existing operations, particularly for those growing unique varieties and serving niche markets.

- **increased interest in organic products** (Statistics Canada, 1999) - the relatively small number of farms currently producing certified organic products in Waterloo Region (21 farms in 2001 or 5% of the provincial total) and growing consumer interest in organic products would suggest that there may be room for growth in this area.

- **increased consumption of certain dairy products** - given the growing importance of dairy farming in Waterloo Region and the presence of only one milk processor in the region, opportunities may exist for new milk processors, particularly for those focusing on specialty cheeses and similar niche markets.

- **increased consumption of vegetable oils and cereal products** - as soybean production increases and consumer interest in soy-based products increases, new opportunities may arise for oil seed milling in Waterloo Region. Opportunities may also exist for specialty grain production and processing as consumption of bakery products and cereal-based snacks increase.

- **increased consumption of food outside the home** - food cooked at home is becoming less important as lifestyle situations and choices place greater time constraints on consumers. Consumers now spend 1/3 of their food dollar on meals outside the home compared to 1/6th 30 years ago (Statistics Canada/Little and Bennett, 2000). This will continue to offer opportunities to the food service industry to expand in new and creative ways.

- **increased interest in day trips and similar outings** (Statistics Canada, Domestic Travel, July 2002) - given the proximity of Waterloo Region to a significant population base and the general aging of the population, a host of opportunities in "entertainment farming" and "agri-tourism" would merit consideration. The focus on local maple syrup production and related activities is indicative of what can be done in this area.

5.3.7 Land Related Issues

Each of the three sectors is dependent on a land base to carry on its activities. Not surprisingly, each faces both common and sector specific issues in dealing with its land base. Common issues across sectors include ease of access, land use compatibility with neighbouring uses, land costs, flexibility in land use controls, municipal taxation and adequacy of local infrastructure – water, sewer, hydro and gas.

Issues particular to the primary sector, which are reflected in trends reported in the Agricultural Census data, include loss of farmland, a reduction in the number of farms and the high percentage of land that is rented in some local municipalities. The decline in farmland area in Waterloo Region raises long-term concerns about the viability of agriculture particularly in areas abutting existing urban areas. A number of societal pressures including population growth, an increase in leisure time and disposable income, and increased mobility of the workforce are all contributing to the movement of non-agricultural residents into rural areas (Odyssey Report. 2002). At the same time, the overall decline in the number of farms raises important questions about the long-term viability of smaller rural communities in Waterloo Region and the ability of the remaining rural population to support key farm services and the local tertiary sector. The relatively high percentage of farmland that is rented in certain areas of the region has both positive and negative implications. On the positive side, it makes land

available for those wishing to expand with a minimum capital outlay. On the negative side, it raises concerns over whether such lands are being managed in a sustainable fashion and whether such lands will remain in agriculture over the long-term.

While local land use controls are primarily the responsibility of local municipalities, the Regional Municipality of Waterloo can and does play a co-ordinating and leadership role in this area in addressing both the common and unique needs of each sector. Understanding the needs of each sector will be particularly important as the regional government moves to implement its Regional Growth Management Strategy and to develop its Regional Transportation Master Plan.

5.3.8 Greater Attention to Agri-Food Interests in Economic Development Activities

Given the importance of agriculture and food-related activities in the regional economy, promoting the agri-food economy will be a key factor in fostering its long-term viability. Current economic development programs tend to focus on urban employment opportunities and overlook the many economic benefits of supporting a vital rural community.

While Waterloo Region has been reasonably successful in attracting "footloose" food processing operations, there is no specific strategy in place to attract this type of processor and to retain and further develop the supply-oriented and demand-oriented operations currently in place. A number of processors have been in Waterloo Region for an extensive period of time. However, food processing is highly competitive and historical presence does not guarantee future presence. As companies are generally affected by both push and pull factors in determining whether to relocate, a supportive environment is needed to ensure the interests of the agri-food sector are not being overlooked.

5.3.9 Agri-Food Input into Policy Development and Regional Decision Making

Given the range of interests involved in the agri-food economy and the wealth of knowledge present amongst those interests, industry stakeholders can play an important role in aiding decision makers in the development of agri-food policy. The development of Foodlink Waterloo Region resulted from broad consultations with local food system stakeholders including representatives from the non-profit, government and agriculture sectors.

The development of a regional Agriculture and Food Advisory Committee represents another option for incorporating industry stakeholders in agri-food policy development. Such a committee could provide Regional Council with timely input on key issues facing the three key sectors of the food system and take responsibility for the development of an overall strategy to ensure that the food system continues to make a major contribution to the economic, social and environmental well-being of the region for years to come.

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APPENDICES

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Appendix A Literature Review

A1.0 Introduction

Given the important role played by agriculture and food-related activities in the economy and day-to-day life of most countries, it is not surprising that a significant amount of research has been undertaken into the linkages among, and the economic impacts of, such activities. This literature review, which draws on a variety of studies, journal articles, Internet and other sources, is designed to reflect some of the more pertinent findings of recent work. It explores the overarching topic of food systems and associated models; speaks to the 3 economic sectors defined in the Introduction – primary, secondary and tertiary; and concludes with an overview of recent consumer trends.

An extended review of agricultural employment trends and issues is presented as part of the profile on the primary economic sector. This includes an examination of broad trends affecting employment in agriculture at the national, provincial and regional level, and a review of skill and training trends, issues and needs in agricultural employment.

A1.1 Food Systems - From Field-to-Table

As food systems continue to evolve, a number of authors are concerned that recent changes are not all positive. The Centre for Integrated Agricultural Systems, for example, notes that:

> While the modern food system is efficient and beautiful as measured by many traditional criteria, a growing number of people question whether this system is sustainable and equitable. Concerns about persistent hunger, food safety, concentration of power within the food industry, and the environmental effects of an industrialized, globalized food system have promoted interest in more regional-based approaches. (2002)

Kinsey (2001, p. 1113) observes that within the system "linear demand and supply chains morph into webs of activities and tasks that are undertaken not by well-defined or self-contained firms or households, but by multiple parties up and down the food chain".

Kloppenburg et al. (1996) draw a parallel between the watershed and the "foodshed". They suggest that as the watershed needs to be managed and protected so does the foodshed. Pothukuchi and Kaufman (1999) suggest that the low visibility of the food system is due to the following reasons: urban residents take food for granted and do not consider the many linkages that are required to bring food into the urban centers; rapid urbanization excluded food from other recognized urban issues such as housing, health, pollution, jobs, and crime; the continuous changes in technology, transportation and food processing and preservation have led to storage of foods closer to urban centers thus further removing farmers and farms from the urban viewpoint; and finally, public policy has divided urban and rural into two domains in which the latter disappears during the decision making process.

Pothukuchi and Kaufman (1999) are of the view that the food system needs to be thought of as an integral part of any urban system since:

- restaurants, fast food places, supermarkets, food stores, taverns, and food wholesalers are part of the food sector and this sector is an important part of the urban economy;
- city residents are employed in the food economy;
- households spend a large part of their income on food;
- cities are being asked to take responsibility for the loss of farmlands;
- food waste, such as food packaging, is a significant portion of the urban wastebasket;
- city water pollution can be a result of fertilizers and pesticides leached from agricultural lands;
- food contamination can result in urban health problems;
- household and individual trips to acquire food can result in higher transportation volumes - the quality of the transport system becomes an issue; and
- food banks, food pantries and soup kitchens are an integral part of life for some lower income city residents.

Feenstra (1997) concurs and suggests that strategies and initiatives need to be implemented in order to increase the viability and health of a community's food system. The strategies include learning about the local food system through historical reviews; estimating the region's ability to grow its own food (urban agriculture); noting the local, seasonal foods and recommend food guides; an examination of distribution, barriers, and opportunities in order to market foods more efficiently. Furthermore, Feenstra recommends that a process be established for gathering data and developing plans, as well as, diversifying community resources involved in outreach and education; finally, Feenstra (1997) reinforces that local food policy planning focuses on enhancing urban-rural linkages.

Dixon (1999) endeavors to understand the connections between the production and consumption of food by using the Commodity Systems Analysis (CSA) framework that shows the flow of food through the various networks. As the commodity or food moves through the system, it acquires value. If the consumption of food increases, then Dixon suggests that production can be increased by considering production practices, grower organization and labour as a factor of production, science production and application, marketing and distribution networks.

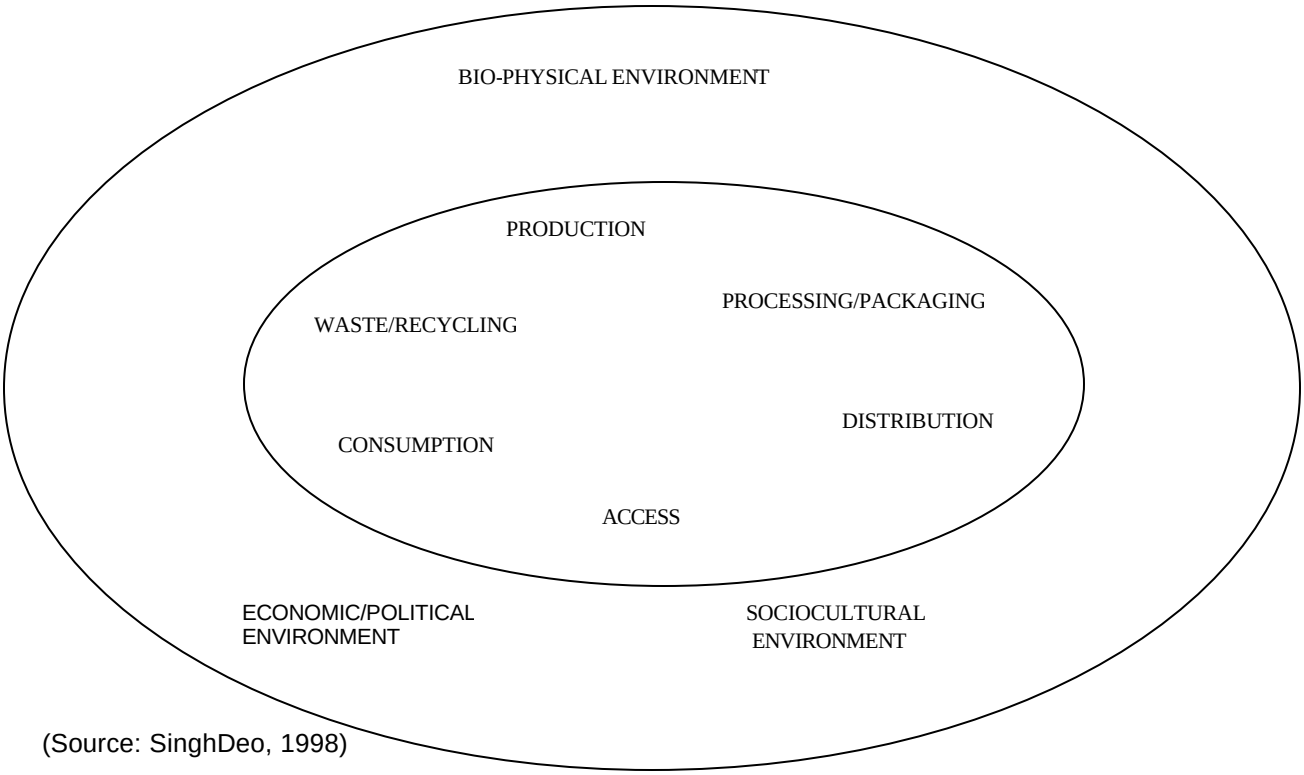
Another unique perspective by Kameshwari and Kaufman (2000, 1999) is that planners have not prioritized the food system as a concern and that this may present a problem in the actual conceptualization. Planners believe that the food system is a social service concern and not part of physical development which is a planning concern; the food system is a rural issue and not an urban issue; it is a part of the private domain rather than the public; most planning agencies are not paid to conduct food system planning only urban planning; planners observed that the food system seems to be self-

healing, i.e. it adjusts and responds to changes and fluxes and continues to flourish regardless of the pressures it experiences through time. The end result is that the discourse around the food system does not include planners.

A1.1.1 Food System Models

Figure A1.1 is a very general depiction of a food system by SinghDeo (1998). This author sees specific food-related activities - production; waste and recycling; consumption; access; distribution; and, processing and packaging – occurring within broader bio-physical, economic/political and socio-cultural environments. While conceptually useful, such a depiction is limited in that it does not include employment or total gross sales, which help to illustrate the size of the direct and indirect impacts in the system.

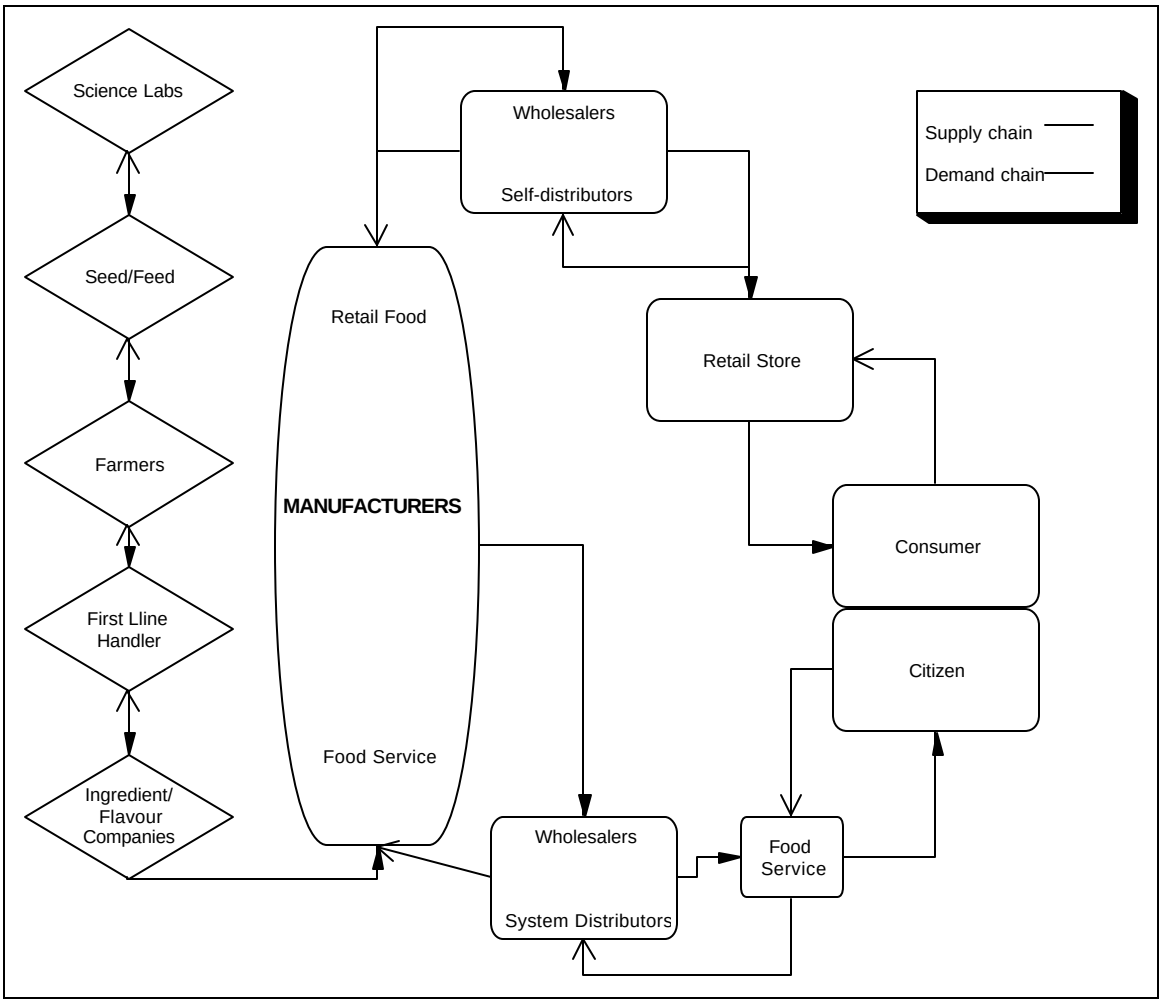
Figure A1.1 The Cycle of Food: A General System



(Source: SinghDeo, 1998)

Figure A1.2 by Kinsey (2001) shows key components and flows in the food system but also fails to include a quantitative component. Another drawback of Figure A1.2 is that it fails to reflect the varied set of inputs required by most farm operations. For instance, Towell (1999) conducted a study in Haldimand-Norfolk Region in which he found that Mennonites from Durango, Mexico were traveling five days to plant and harvest fruits and vegetables on Southern Ontario farms. These types of resources, as well as other types of support, are required by farmers to run their farms effectively.

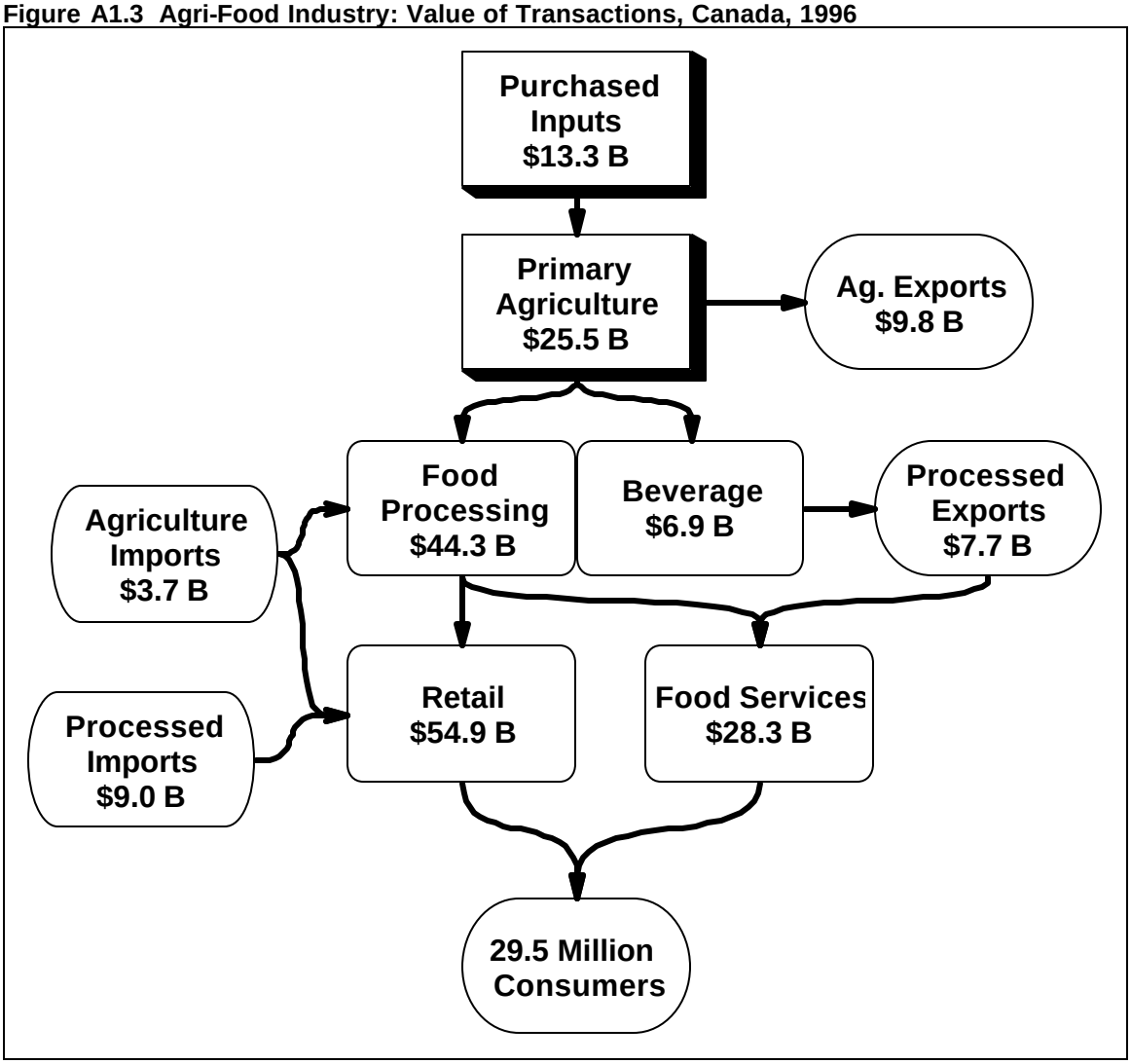
Figure A1.2 Supply and Demand Chain of the Food System in the US Economy



Source: Kinsey, 2001, p.1114

Figure A1.3, which depicts the Agri-Food Industry in Canada in 1996, is interesting in that it captures key components of the Canadian food system and provides a sense of the scale of flows within the system at that time.

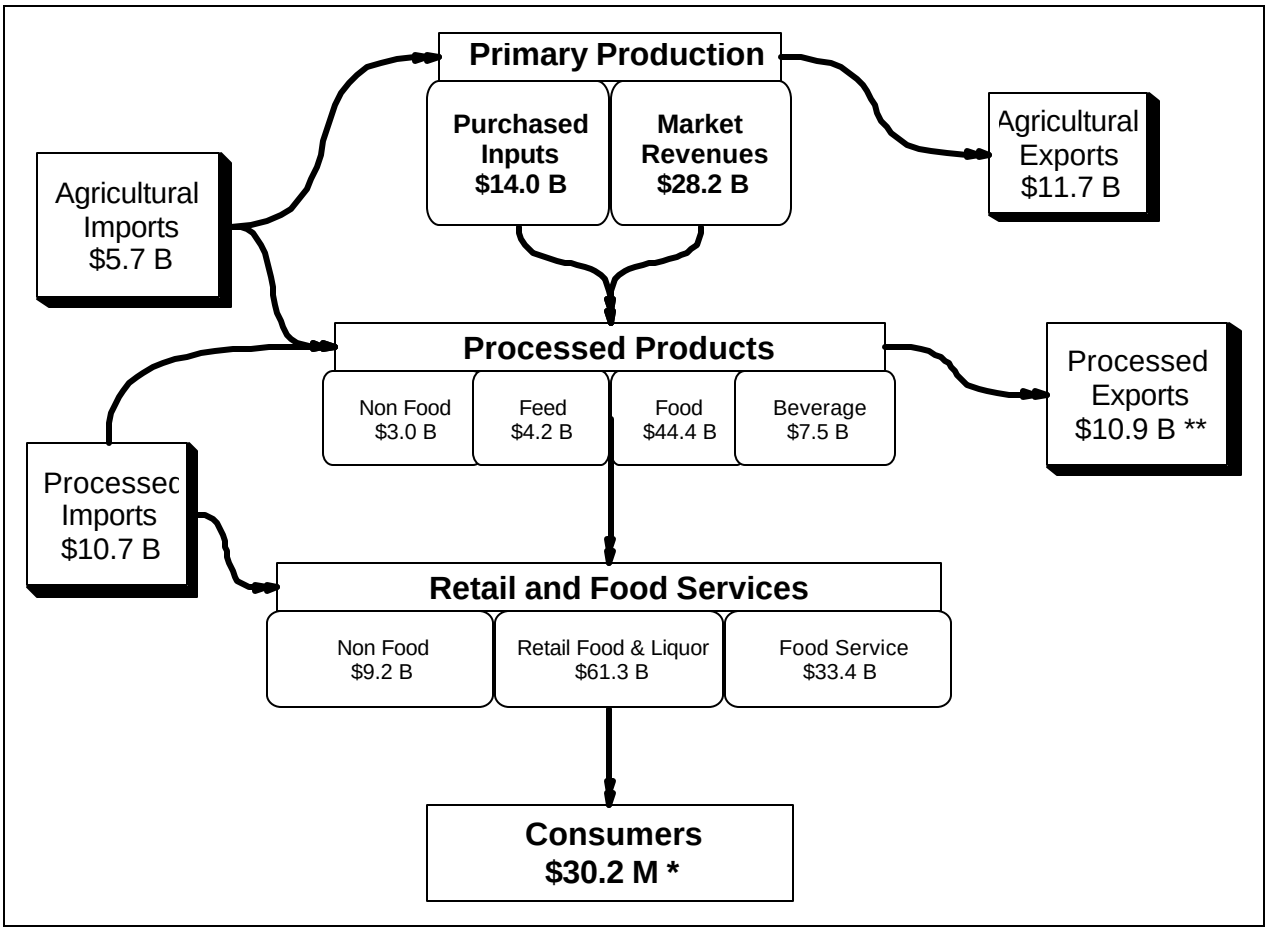
Figure A1.3 Agri-Food Industry: Value of Transactions, Canada, 1996



Source: Statistics Canada; Food Bureau - Agriculture and Agri-Food Canada, April, 1997

Figure A1.4 is also a model of the Canadian Agri-Food system. It illustrates the flow of dollars within the system for 1998. Upon comparison with Figure A1.3, increases can be seen in all facets of the system. This macroeconomic representation will form the basis of the more detailed model of the Waterloo food system to be presented in the report.

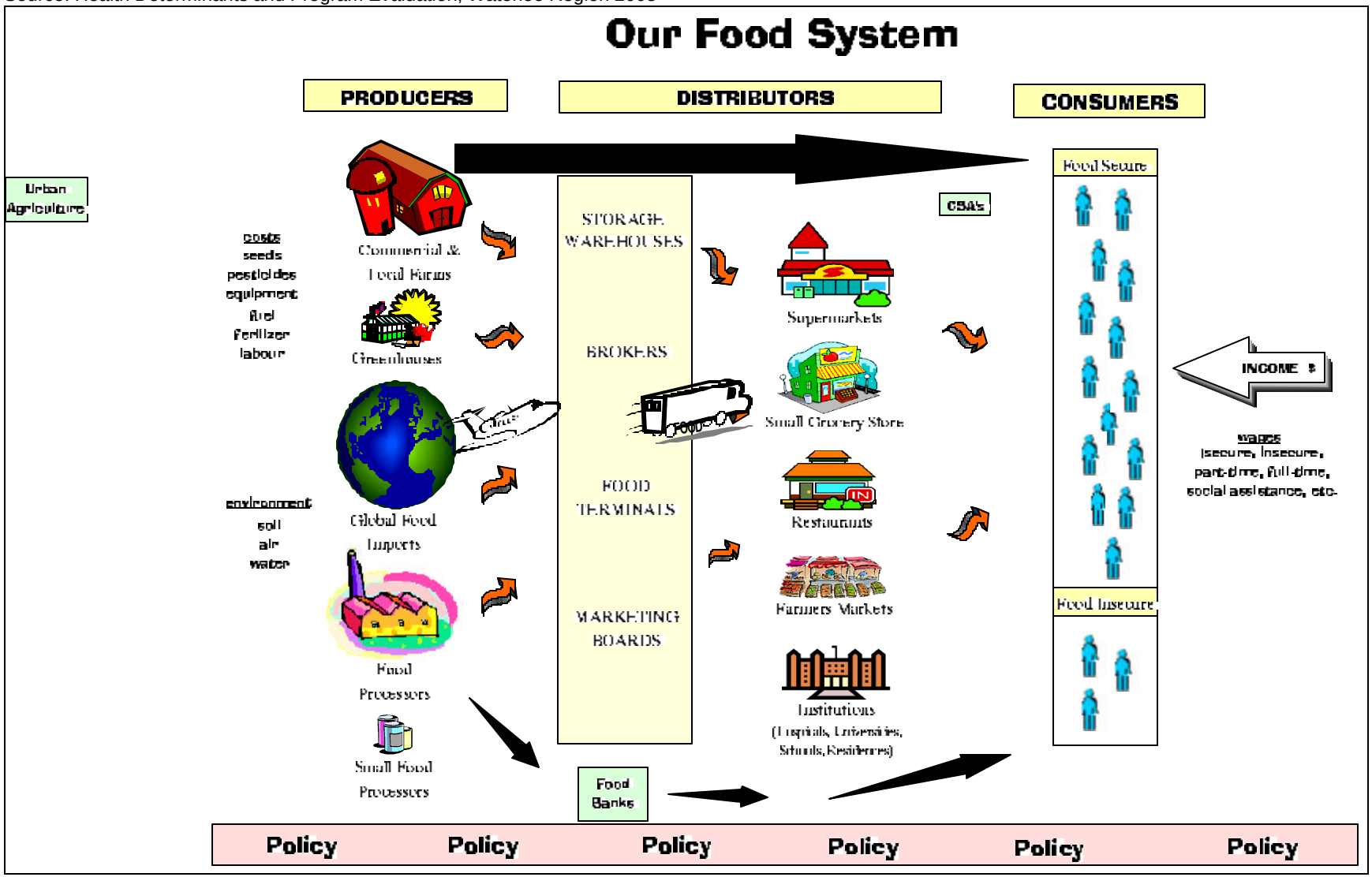
Figure A1.4 Canadian Agri-Food System Value of Production and Sales, 1998



*Food expenditures includes expenditures on alcoholic beverages and tobacco.
**Processed Exports includes a small component of Other Non-Food Exports consisting mainly of ethanol and linseed oil.
Source: Statistics Canada, 1999.

Figure A1.5 is the food system model currently in use in Waterloo. It graphically illustrates the food system from producers to distributors to consumers and is useful in helping residences better understand key aspects of their local system.

Figure A1.5 Waterloo Region Food System, 2003
Source: Health Determinants and Program Evaluation, Waterloo Region 2003



A1.2 Primary Sector

Modern agriculture encompasses a wide range of industrial activity normally categorized in virtually every major sector and sub-sector as defined by the North American Industrial Classification System (NAICS). Production agriculture alone is subdivided into approximately 90 categories within NAICS.

This sector includes farmers and all other food producers. Canadian federal agencies, such as Statistics Canada and the Canadian Customs and Revenue Agency (CCRA), consider a farmer as someone who derives 51% of their income from farming.[1] As is discussed later in this literature review, the current definition of farmer is sometimes problematic when one is attempting to understand primary agricultural employment, as an increasing number of Canadian farmers derive a significant portion of their income from off-farm employment.

The economic contribution of farmers is typically measured in terms of jobs and dollars created on the farm through primary production activities. The value of farm gate sales (farm receipts) and number of farm jobs are viewed as the direct economic impacts of agriculture.

Mennonite farmers, while not unique to Waterloo Region, play an important role in the local economy and community life. Within the Mennonite/Amish Community are various subgroups: Old Order Amish, Old Order Mennonite, Amish, Conservative/Markham Mennonite, Church of God in Christ Mennonite, David Martin Mennonite, Low German Speaking Mennonites from Mexico plus other sub-groups. (personal communication, St. Jacob's Visitors Centre).

In the research literature, studies by Wandel (1995) and Jenkins (1986) focus on the farming practices of Old Order Mennonites otherwise known as Anabaptist farmers. Although they have been practicing farming with emphasis on smallness, homogeneity, and continuity, Wandel states that their way of farming is becoming more secular. An article by Kehler (2002) intimates that Mennonite farmers, whether Old or non-Old order, can aggregate as a faith and influence food production by:

- connecting urban people with locally grown food;
- promoting self-sufficiency, not only in Canada, but in lesser developed countries;
- placing environmental issues in context; and, finally,
- creating more dialogue between food producers and food industry.

Mage and Fletcher (1990) compared Mennonite and non-Mennonite agricultural systems and land use characteristics in Mt. Forest Ontario. Other studies focus on

[1] Statistics Canada defines a census farm as an agricultural operation that produces at least one of the following products intended for sale: crops (field crops, tree fruits or nuts, berries or grapes, vegetables or seed); livestock (cattle, pigs, sheep, horses, exotic animals, etc.); poultry (hens, chickens, turkeys, exotic birds, etc.); animal products (milk or cream, eggs, wool, fur, meat); or other agricultural products (greenhouse or nursery products, Christmas trees, mushrooms, sod, honey, maple syrup products).

religious, cultural or ethnic identities of Mennonites and the changes they have experienced over the years (Winland, 1990; Fretz, 1989; Haden, 1990; Frey, 1971).

Little research appears to have been undertaken into the economic impact the Mennonite Community has had on the Region of Waterloo's economy.

A1.2.1 Recent Studies on the Economic Impact of the Primary Sector

Harry Cummings and Associates (HCA) have conducted studies on behalf of a variety of clients, to better understand the economic impact of agriculture in Eastern Ontario (five Counties), Huron County, Simcoe County, Lambton County, Perth County, the four counties around Kingston, Northeastern Ontario, London and surrounding area, and the new City of Ottawa. Harry Cummings et al. (2002) have used economic base analysis and input-output analysis to quantify the direct, indirect, and induced impacts of agriculture. By tracking agri-related jobs and sales, HCA found that "1 to 3 jobs are generated in other industrial sectors for every on-farm job (p.65). Similarly, for every dollar in farm gate sales, approximately two dollars are generated in agriculture related sales" (p.66). Tables A1.1 and A1.2 indicate jobs and sales in several study areas, as well as sales expenditure and employment multipliers.

Table A1.1 Total Direct and Indirect Agri-related Sales: Various HCA Studies (in $ millions).

Research Area	Direct Sales (Total Farm Receipts)	Indirect Sales (Agri-related businesses)	Total Sales	Sales Expenditure Multiplier
Algoma Manitoulin (2002)	$32.2	$41.3	$73.6	2.3
Blue Sky Region [a] (2001)	$37	$43	$80	2.2
Lambton (1999)	$301	$472	$773	2.6
Elgin, Middlesex, Oxford (2000)	$1,131	$1,490	$2,621	2.3
Huron [b] (1998)	$512	$1,489	$2,001	3.9
Perth (2000)	$430	$653	$1,083	2.5
Simcoe (1999)	$265	$518	$783	3
Frontenac, Lennox & Addington, Leeds & Grenville (2000)	$183	$351	$534	2.9
Lanark & Renfrew (2000)	$98	$142	$240	2.4
Prescott, Russell, Stormont, Dundas & Glengarry (1999)	$363	$756	$1,119	3.1
City of Ottawa (2000)	$137	$265	$402	2.9

[a] The Blue Sky Region includes Nipissing, Parry Sound and the eastern portion of Sudbury District, as well as the City of Greater Sudbury.
[b] Huron County was the first study of this type to be carried out. The methodology has been continuously refined for the succeeding studies. The higher numbers associated with Huron County's Indirect Sales may reflect these refinements.
Source: Cummings et al., 1998,1999, 2000, 2001 and 2002.

Table A1.2 Total Agricultural Related Jobs : Various HCA Studies.

Research Area	Direct Agr. Jobs	Indirect Jobs [a] (Agri-related businesses)	Induced Jobs	Total Jobs	Employment Multiplier
Algoma Manitoulin (2002)	1,081	242	2,050	3,373	3.0
Blue Sky Region [b] (2001)	1,330	404	3,329	5,063	3.8
Lambton (1999)	3,920	1,624	3,382	8,926	2.3
Elgin, Middlesex, Oxford (2000)	16,515	6,856	9,348	32,720	2.0
Huron (1998)	5,025	14,186	3,528	22,739	4.5
Perth (2000)	4,935	3,133	3,066	11,131	2.3
Simcoe (1999)	4,770	2,237	7,414	14,421	3.0
Frontenac, Lennox & Addington, Leeds & Grenville (2000)	4,325	1,935	5,321	11,581	2.7
Lanark & Renfrew (2000)	3,010	848	3,163	7,021	2.3
Prescott, Russell, Stormont, Dundas & Glengarry (1999)	5,955	4,516	7,007	17,478	2.9
City of Ottawa (2000)	3,510	1,045	5,466	10,021	2.8

[a] Indirect jobs are presented as full time equivalents.
[b] The Blue Sky Region includes Nipissing, Parry Sound and the eastern portion of Sudbury District, as well as the City of Greater Sudbury.
Source: Cummings et al., 1998, 1999, 2000, 2001 and 2002.

These studies have helped policy makers, at both the provincial and local levels, to better understand the important role agriculture plays in the economy and impacts it has on associated sectors.

A1.2.2 Broad Trends Affecting Employment in Agriculture and Agri-Business in Canada and the United States

A number of the trends affecting and interrelated with agricultural employment issues in Ontario are shared with various other economic sectors across Canada. Although the specific details may differ somewhat, these trends are also shared with the agriculture sector in the United States. Some of the significant broad trends are outlined in the following sections.

Increasing Farm Size and Decreasing Numbers of Farm Operations

Census of Agriculture statistics for both Canada and the United States indicate that the size of North American farm operations has been increasing for the past few decades, and this trend toward larger farms appears to be intensifying[2] (Statistics Canada, 2002; USDA, 1997). The growth of the average farm size is attributable to a number of factors, which include the following:

- Decreasing operational margins for individual operations (Statistics Canada, 2002), have stimulated the accumulation of more land.
- An increase in the number of large corporate-controlled operations, which tend to be larger in size than traditional single-family farms.
- An increase in the vertical and horizontal integration of the entire food production system, which has a negative effect on operational margins.

These factors, in turn, interact with globalization, which has had multiple and complex impacts on agricultural production. While globalization has increased competition for the production of many agricultural commodities, it has also introduced market distorting subsidy reactions from national governments. Globalization - induced competition has increased the demand for economic efficiency in agriculture, which has been a factor in the parallel development of larger, more integrated corporate farm operations and the trend to larger traditional family farms.

Growing farm size, the push for production efficiency, and the intensification of the capital requirements for farming has driven down the total number of individual farm operations in Canada and the United States. The land and physical assets of previously existing small farms are often purchased by larger independent or corporate operations. Those small family-farming operations not incorporated into larger single-family farms or corporate operations may be put to some other rural land use, or ultimately converted to residential, commercial, or industrial uses through urban expansion.

[2] Statistics for the United States (USDA National Agricultural Statistics Service) 2002 census are not yet available, but earlier agricultural data suggests that average farm size increased from 364 acres in 1964 to 487 acres in 1997 (USDA, 1997). There have been anomalies in this trend, with the 1997 census indicating that average farm size had decreased somewhat in comparison to 1992.

An Aging Agricultural Workforce

As a broad economic sector, production agriculture in Canada has a workforce that is significantly older than the total national workforce, and one that is older than the workforce in most other sectors. Canadian agriculture does share this characteristic with its counterpart in the United States. The average age of Canadian agricultural workers is advancing more rapidly than the overall workforce, largely because the proportion of the workforce made up of young workers (< 35 years old) is rapidly declining – fewer young people are entering careers in production agriculture (Statistics Canada, 2001b). While the age cohorts below 35 years of age make up approximately 40% of the overall Canadian labour force, farm operators in these cohorts represent only 12% of total farm operators in the country. Furthermore, the number of farmers under the age of 35 has decreased by approximately one-third since the 1996 census. Even with other influences remaining static, this trend translates into a significant long-term decline in the number of skilled operators available to the industry. For agriculture, the relative lack of young operators is amplifying the aging phenomenon occurring in the broader Canadian workforce, which stems from the demographic shift – the aging of Canada's "Baby-Boom" cohorts.

The aging phenomenon in Canadian agriculture is more complex than the summary statistics portray, however, because the average age of farm operators varies geographically and by the type of agricultural production. For example, workers in some types of Southwestern Ontario production, notably dairy and cash cropping, have average ages that are significantly lower than the provincial and national averages (Yourk, 2002).

The situation is more pronounced when one examines census summary statistics for Ontario, where the proportion of young farm operators (35 years of age or younger), is now below 11%. This proportion has declined from approximately 15% in 1996; so again, the rate of decline in young farm operators is significant.

As is the case nationally, the broad age cohort statistics do not provide a full portrayal of the characteristics of farm operators in the province. Statistics Canada's own analysis suggests that the proportion of young farmers varies considerably across the sub-provincial regions and across different types of production (Yourk, 2002). In Southwestern Ontario, for example, there tends to be more young operators in cash crop and dairy operations. In addition, there appears to be more young operators on farms that have relatively high gross receipts. Finally, farm operations with a multi-generational history have a higher proportion of operators who are 35 years of age or younger.

In Waterloo Region, the age distribution of farm operators compares favorably with the provincial and national situation. Almost 23% of the region's operators are 35 years of age or younger, and the average age of all farm operators is 46, reflecting the greater proportion of younger farmers. While these numbers are relatively positive, Waterloo

Region still faces the potential for a longer-term shortage of skills in agriculture, particularly if present trends are not reversed.

Agricultural economics experts and farm operators both cite a number of reasons why there is such decline in the number of young operators. These include the amount of capital required to get into production agriculture, the ongoing financial risk that is exacerbated by international trade barriers and disputes, the long hours involved in maintaining production, and the growing demands of business management associated with modern production operations. In addition, many older operators may discourage potential entrants into industry because of their own perception of a livelihood that suffers from very low return on human and financial investment.

As mentioned earlier, young operators face the daunting prospect of ever-increasing capital intensity in agriculture. When starting out, young operators must be prepared to make or continue large capital investments that have a long-term horizon. Even where the ownership of a family farm is changing from one generation to the next, very few of these transfers take the form of a direct inheritance. Most transfers require provisions to allow for the continued support of the previous generation of operators in their retirement, because much of their life-long investment is represented in the farm assets (Hoppe, 1997). Few farming parents are in the position to hand over their operation with minimal financial obligation as it is their retirement security, regardless of how much they may wish to support their children's pursuit of agricultural careers and the associated lifestyle.

In one response to the capital intensity problem, some younger farmers are turning to contract production agreements as these reduce risk, pay relatively well, may not require as much capital as independent production, and may be more appealing to financial institutions (American Farm Bureau, 1999; Spurr and Coughler, 2000). However, these agreements have their own drawbacks, including potentially contributing to a short-term outlook on agriculture as a career and lifestyle.

The disincentive effect of the need for greater capital is made worse by continuing financial uncertainty in agriculture, driven in part by the complex relationship between globalization, trade disputes, and subsidy conflict. The need to acquire and manage more capital also creates increased management complexity and adds stress to the business management component of production agriculture. The need to expend more effort on business tasks rather than direct farming tasks, and to do so in a financial environment over which they have relatively little control, may act as a further disincentive to potential young operators. Older operators may, consciously or unconsciously, reinforce perceptions of these disincentives as they themselves struggle to adapt to a rapidly changing industry.

The changing commercial and socio-cultural landscape in agricultural areas is contributing to increasing land values, making it difficult for young people to acquire land and, at the same time, making the sale of existing high quality agricultural land appear more favourable. In addition, the increasing presence of large corporate farms often

may increase land prices. In areas adjacent to urban centres, the land price increases are exacerbated by the demand for new land for industrial, commercial, and residential development. Regardless of the specific factors, the relatively rapid increase in land values is another significant obstacle to young Ontario farmers attempting to establish their own operations.

Other factors are influencing the relative lack of new entrants to agricultural production. Implicit in the comments above is the reality that the traditional pool of replacement farmers (children raised on farms) has decreased as a result of off-farm migration (for economic, as well as socio-cultural reasons), but farming is also affected by the same trends influencing the broader Canadian society and economy - the "Baby-Boom," as mentioned above, and the declining birth rate. The declining birth rate means that the number of children born within farm families (the traditional source of new workers) has fallen, and therefore there is a smaller number of potential young operators and workers for employment in production activity.

The extent of the aging of the agricultural workforce has serious long-term implications for agricultural production. If the trend is not reversed, there may not be enough skilled farm operators and workers to achieve the desired level of production from Canadian agriculture. In addition, the lack of young entrants means the potential for lost opportunity with respect to the transfer of skills and knowledge from older farmers to younger farmers. While those involved in agriculture generally accept that the low proportion of young producers represents a potential longer-term crisis for the industry, others argue that the lack of replacement farmers will not be a significant issue in the future, as technological advances and new management structures will mean that fewer workers will be required to produce any given level of output.

The Growing Importance of Off-Farm Employment

The proportion of Canadian farms that derive a portion of their income from off-farm employment has risen significantly in the past two decades. For example, part-time off-farm employment in Canada increased by approximately 50% between 1982 and 2002. In 2002, approximately 68% of farm families had at least one adult member working in non-farm employment (Martz and Brueckner, 2003). While more women work off the farm than men, the greatest increase in off-farm work has occurred among the latter. This reality, when combined with the fact that younger operators are more likely to seek employment away from the farm, means that operators and their families often face serious time constraints. While off-farm employment generates valuable income to invest in the farm, operators have to make difficult choices about where to expend their limited on-farm time.

One outcome of the increase in off-farm work has been that segregation of farm work along gender lines has decreased – in other words, the availability of on-farm time has become a more important factor than one's gender in determining who will address various farm tasks.

The Increased Use of Technology in Agricultural Production

As an industrial sector, production agriculture has, arguably, witnessed as much substitution of technology for labour as any other sector in North America. The post World War II period witnessed intensive and rapid mechanization of farm production, and the period between approximately 1950 and 1970 was one of massive off-farm migration – movement pushed by mechanization on the farm, and pulled by increased off-farm, urban employment opportunities – most in manufacturing industries.

Recent decades have brought increasingly sophisticated technology to farm production, including computerization and biotechnology. These technologies have influenced farming practice directly (e.g., computers in farm management) and increasingly through integration with mechanical systems (e.g. electronics in farm equipment) and across the entire production system (e.g. computer financial/business management systems integrated with geographic information systems, supporting the application of biotechnology across the entire production system).

Food System Integration

The North American (and, increasingly, global) food system has seen rapid and extensive integration and concentration across the entire system from "land to mouth." A relatively small number of very large international corporations control an increasingly large proportion of the entire food system, with companies or subsidiaries selling farm production inputs and support services, purchasing and processing farm products and marketing processed food products to consumers (Kirshenmann, 2003a, and 2000b; Hefferman, 1999).

While vertical and horizontal integration allows for the maximization of economic efficiency and can lead to high food quality and food safety, the extensive corporate control exerted by the limited number of major players leaves farm operators with limited options as far as their choice of inputs, production methods and markets. The insatiable drive for economic efficiency also results in very low operational margins for producers and may reduce the ability of operators to pay heed to the land stewardship and environmental concerns that they would otherwise address. In turn, these potential limitations influence the lifestyle attributes often prized by farm operators and their families.

Long-Term Decline in the Perceived Value of Agricultural Careers

The perception of agriculture has changed dramatically in recent decades, both among those familiar with agricultural operations, and among the general population, whose linkage to, and understanding of, agriculture as an activity has decreased significantly.[3]

[3] The various Ontario agricultural impact studies conducted by HCA and others highlight these perceptions explicitly and implicitly. For example, refer to the *Middlesex Agricultural Sector Assessment Study*, conducted by HCA in 2000.

Potential young farmers are all too familiar with the financial uncertainty, the hard, and often poorly compensated work involved, and the reality that financial and lifestyle benefits may accrue only in the very distant future, if at all. As a whole, producers and workers in agriculture may never have had a more pessimistic outlook regarding their occupations and careers. For example, a 2001 study in the United States found that only one-quarter of farmers and ranchers felt that they were better off than five years previously (Allen, 2001). This result was significantly lower than for persons reporting from a broad aggregate of occupations in the U.S. economy.

This "insider" perception of agricultural hardship and the negative implications of industrialized agriculture, among other things, also may have the effect of decreasing the value or desirability of agricultural careers on the part of young people who might otherwise be drawn to the sector – from both the traditional sources (existing agricultural households) and from the broader Canadian workforce.

On the part of the public, a limited and superficial understanding of subsidy "wars" and the seemingly low "public good" value of agricultural support programs are among the drivers of misperception about the production side of the industry. On a more positive note, more recent research suggests that attitudes to the food system and agriculture are shifting, with consumers showing more interest and a willingness to become better informed about food production. Public awareness and concern regarding agriculture and food production appears to be increasing and consumers are starting to recognize the importance of an agricultural system that is socially, economically, and environmentally healthy. It is likely too early to determine to what extent consumer attitudes will shift, and whether this shift will have a positive impact on the perception of agricultural careers, or will contribute to the enhancement or stabilization of employment within the industry.

Evolving Rural Demographics and Social-Cultural Change

Although there are local exceptions, rural populations across most of North America are increasing. However, with a decline in the proportion of the rural population involved in agriculture, the social and cultural landscape of rural areas is evolving away from the traditional agricultural environment of much of the twentieth century. One result is greater potential for conflict between agricultural and non-agricultural residents. Another is a dilution of the common values and community supports that were a part of a more homogeneous agricultural setting. The extent and rate of social and cultural change affecting agriculture appears to be greatest in rural settings adjacent to large urban areas.

While the rate of social and cultural change may be greatest in rural areas along the urban fringe, an American farm and employment study found that since the 1970's ranch and farm employment has remained relatively stable in these areas, with more remote areas experiencing greater declines (University of Michigan, 2003). These findings were surprising and suggest that urbanization may not have the degree of negative impact on farming as many have speculated. In reality, urban development

may have a net positive impact for agriculture by stimulating employment growth through niche markets, the potential for value-added production, and even by creating better access to more diversified support services. It is in urban-adjacent areas where the greatest opportunities for agricultural innovation and diversification may exist.

A1.2.3 Broad Ontario Trends From the Census of Agriculture (2001 and 1996)

- Like most of the rest of the country, the 2001 census indicates that there has been continued decline in the number of census farms. Simultaneously, there has been an increase in average farm size, both in acreage and in the size of operational gross receipts.
- Net receipts for farms have increased since 1996, but this increase has not been as great as the increase in gross expenses. The result, in general, is a continuing decline in operating margins.
- The proportion of young operators (< 35 years of age) has decreased sharply from 1996, but there is significant variability across agricultural sub-sectors. The census reveals that multi-generational farms and larger operations are more likely to have younger operators and younger workers.
- Younger farm operators are also more likely to be employed in off-farm work.
- On a positive note, the gender characteristics of farm operators continue to evolve as evidenced by the following:
    - The proportion of female farm operators in the province has remained constant, with Ontario having one of the highest percentages of all provinces.
    - Across Canada, women in 2001-2002 were much more involved in core farm tasks than they were in 1982.
    - There are significantly more young women 29 to 39 years of age operating all types of farm equipment in the survey compared to women over 50 years of age. This trend is further evidence of a shift in traditional roles in farming.
    - Technology, the need for youth to contribute more, and changes in social opinion have all influenced the higher participation rate of young females in farm operations.

A1.2.4 Broad Waterloo Region Agricultural Employment Characteristics and Trends

The 2001 Census of Agriculture reveals several important characteristics and trends for agricultural employment in Waterloo Region, including the following:

- In Waterloo Region, the median operator age is significantly lower than that for both the province and the country.
- Waterloo Region operations are relatively more capital intensive and average gross receipts are higher than the provincial average.

- The large Mennonite population significantly influences the overall employment/socio-economic situation.

A1.2.5 Attempts to Address, Stabilize, and Improve Agricultural Employment: Canadian and Perspectives

Canada, the United States, and nations within the European Union have a long history of governmental and non-governmental attempts to improve agricultural employment and livelihoods, with variable results. These interventions include the following:

Subsidies

Virtually all developed nations employ or have employed various forms of subsidization in an effort to preserve, improve, or promote national agricultural activity. Subsidies take many forms, but they are essentially direct or indirect methods of managing prices (for inputs and outputs) and production levels. In the current globalizing marketplace, agricultural subsidies are a major source of ongoing trade tensions. Much of this tension stems from differing views of what comprises subsidization. Indeed, it seems that governments deliberately employ complexity in developing subsidy programs to obscure, or at least introduce an element of doubt as to the exact nature of programs, and thus make it difficult for competing nations to build and present a case for sanctions and counter-actions when presenting before various international trade organizations[4].

Although Canada continues to provide an array of subsidization programs for various agricultural sub-sectors, many writers and industry experts would argue that the United States and the European Union directly and indirectly subsidize their agricultural producers more than any other world nations. In fact, the United States has recently embarked on the implementation of their largest, most comprehensive, and most-globally influential agricultural subsidy programme in their history – the Farm Security and Rural Investment Act of 2002. This legislation has met with resistance and condemnation from other world nations because they perceive it as contradicting recent global efforts at reducing agricultural subsides and because of the potential impact on global agricultural commodity prices.[5]

In spite of the global popularity of agricultural subsidies, and the fact that, from a national perspective, many can be legitimized, there are many local, national, and international drawbacks to their use (AAFC, 2000b). Their impact on agricultural employment, careers, and livelihoods is huge; with these impacts varying across the scale from local to global. For example, direct agricultural support programs are often difficult to implement in a way that is equitable, given the present broad-spectrum of operation size and business structure. The same subsidy program applied to both small family farms and large corporate operations may actually increase inequity and

[4] For recent commentary on the complexity of resolving international farm subsidies, see (Fitzgerald, 2003).

[5] For EU reaction to the U.S. Farm bill see the Europa web site dedicated to information and commentary on this legislation: http://europa.eu.int/comm/agriculture/external/wto/usfarmbill/index_en.htm.

negatively affect smaller operations. Larger corporate operations are likely to receive greater funding, or greater benefits and leverage these advantages to accumulate assets or gain efficiencies that are inaccessible to smaller operations.

Any discussion of agricultural subsidies is laden with emotion, conflicting values, and often promotes conflict on a number of levels, including national and regional autonomy, cultural, social, and even economic development philosophies. Nationally and regionally, viewpoints vary from those that see subsidy and support programs as hastening the decline of rural life and rural communities to those that view them as useful tools and a natural progression in contracting traditional agricultural employment in the name of modernizing and increasing efficiency in the entire agricultural sector.

Recent Producer Subsidy Trends in Canada

The federal government has employed a wide array of agricultural subsidies in recent decades, but the three most recent programs are as follows (NFU, 2003a):

- Crop Insurance (CI), which reimburses farmers who suffer large yield losses on specific crops.
- The Canadian Farm Income Program (CFIP), which reimburses farmers who suffer very large decreases in gross revenue.
- The Net Income Stabilization Account (NISA), a program that allows farmers to deposit funds and provides government matching funds in order to build up cash reserves that farmers can use to deal with price and revenue declines.

In spite of direct and indirect subsidization in recent years, and improved overall access in maintaining and often improving access to foreign markets (agri-food exports have increased overall), the profit margins on Canadian farms as a whole have continued to narrow (Statistics Canada, 2002a). Furthermore, the proportion of farm incomes derived from government programs has increased substantially, while market incomes have declined (AAFC, 2002a), and the current farm income crisis is widely known.

Rural Economic and Social Development Initiatives

This category of intervention encompasses a host of methods aimed at improving rural economies and/or improving rural social conditions. Many are explicitly directed toward marinating, supporting, improving employment and livelihoods in agriculture.

Assessment of the relative economic, employment, and social impacts of the wide range of rural development initiatives is highly interpretive. From the perspective of the agricultural community, many recent Canadian national and provincial efforts at rural economic and social development have essentially bypassed agriculture – either viewing it as a dead industry, or possessing programing and implementation flaws that intentionally or unintentionally prevent the effective participation of agricultural producers. From the perspective of other industries, organizations and interest groups, opinions vary from one of believing that agriculture is not a good investment of funding

and effort, to the view that agriculture already receives enough assistance in other ways. Nationally, this debate is likely influenced by geographic differences in the economic importance of agriculture and how the media portrays agricultural issues. To many, diversification or improvement in local or regional economies often means essentially writing-off existing activity, including agricultural production.

However, there are differences in provincial approaches to agriculture within rural economic development initiatives, and differences in perceptions about how agriculture fits into these broader initiatives. In Manitoba, for example, all programs that promote rural economic development and employment to rural are seen as supporting agriculture – as many farmers are also working at off-farm employment (Kraft, et al, 2001).

Facilitating Transitions From the Agricultural Industry

Canada's Agricultural Policy Framework (APF)

> The Government of Canada, along with provincial and territorial governments and the agriculture and agri-food industry, is developing a comprehensive agricultural policy that will increase the profitability of the entire agri-food sector. The Agricultural Policy Framework (APF), cost-shared with the provinces, will provide the tools and the choices for producers to strengthen their businesses… (AAFC, 2003).

The APF is comprised of six distinct, but interrelated elements: *Food Safety and Quality, Environment*, *Business Risk Management*, *Renewal*, *Science and Innovation, Gaining Recognition for Quality,* and *Maximizing International Opportunities, and Consultations*

Potential training and skills development implications of the APF are discussed in greater detail in Section 4.1.1. However, under the *Renewal* component, the APF includes a deliberate effort to facilitate not only the augmentation of production activities with other business activity, but also the transition of some farm operators away from production agriculture. The framework intends to do this by providing assessment, funding, and resource support services to help individual operators build on existing secondary businesses and skills (AAFC, 2002b).

Revisiting Co-operative and Alternative Production and Marketing Structures

One response to uncertainty in agriculture is one of engaging in or revisiting alternative business structures, especially producer, processor, and marketing co-operatives. Although agricultural co-operatives have a long history in Canada, renewed interest in this type of business structure may be reflective of a desire to regain some of the lost individual and "local" control over production, employment, and livelihoods, and an effort to reduce the financial uncertainty. While Canadian co-operatives have enjoyed considerable success, with annual sales in the billions of dollars, they face increasing

competition from the same concentrating global market forces which make them appealing to potential members (CCA, 2003).

Value-Added and Niche Development

Many individual producers are reacting to economic uncertainty by attempting to increase the value-added nature of their operations – adding more value to products before they leave the farm, and thus capturing economic value that would normally accrue higher in the production chain. This activity may or may not accompany niche development, where operators produce a product or service that is in high demand by a relatively small (usually local) component of the population. Some of this value-added and niche activity may be facilitated by existing government programs (some non-specific to agricultural) providing innovation knowledge and advice, product/service support, and marketing/business expertise to encourage traditional producers to develop products and services that address niche market demand.

Succeeding in niche markets and specialty products requires entrepreneurial business skills, including financial planning, marketing, human resources management, communications, and leadership. These are skill groups that may not have been given significant attention in previous mainstream agricultural training initiatives.

A1.2.6 Skill and Training Trends, Issues, and Needs in Agricultural Employment

Changing Federal Approach to Training and Development

At the macro level, there is considerable research and discussion of skill and training issues in agriculture in Canada and the United States. However, the availability of research and the identification of industry-specific issues, trends, and potential solutions decreases rapidly as one explores the large number of sub-sectors that make up agriculture and agri-business. This is problematic, as once one gets below the aggregate level, the labour market, skills, and training characteristics would appear to differ considerably across these sub-sectors, and across the broad primary, secondary, and tertiary categories.

Regardless of whether one considers the decline in the traditional family farm to be a critical issue for agriculture as a whole, or part of a necessary social and economic adjustment for rural areas, the change does have implications for the supply of labour. These small-scale farm operations were the source of most of the new workers for production agriculture. While the number of workers needed in agriculture may decrease, there will always be a need for some skilled production workers. The rapid decline of young workers is of concern to the industry – with so few family farm off-spring entering production agriculture, what mechanisms exist to address the skilled labour needs of modern production agriculture?

Until recently, change in the skill and training situation for production agriculture might be seen as one of relatively rapid evolution of skills rather than the emergence of new occupations. However, technology and new products and markets may be forcing a complete re-description of what it means to be a producer or farm operator. Rapid progression in the complexity of overall business management skills required, as well as advancing technical skill requirements (production methods and techniques, and the use of computer technology across all aspects of operation and management) have radically changed the nature of farming, and therefore the types of skills and training required.

Regardless of one's perspective on the change from so-called traditional farming to modern farming, there are potential skill and training implications for the transition. For example, while science and technology have, and will continue to offer much benefit for agricultural production and agri-business, the industry may be unconsciously discounting the value of traditional proven practices and the effective intergenerational exchange of knowledge that was inherent in a system dominated by the small family farm. With small farming operations clearly in decline, a rapid aging of the workforce in the production sector, and the low rate of new entrants into the workforce, the opportunity for exchanging "traditional" knowledge and blending it with "modern" applied technical and scientific knowledge may be substantially reduced.

The most recent national and provincial policy with respect to agricultural training and skills development is evident in the evolving APF (AAFC, 2003), which clearly demonstrates a distinct shift in federal and (as they reach independent agreements) federal-provincial-territorial policy with respect to agricultural training and skills development. For example, the federal government has moved from supporting traditional approaches to individual agricultural operator or worker training ("people-in-seats;" in the words of one agricultural training expert) to providing funding for the support of business and technical skills development where they consider the investment to be most viable. This new training and development approach is, therefore, much more indirect type of support (supporting consultants and interventions by "experts"). It also potentially places more responsibility on operators to identify and justify their own training needs. An important component of this new approach is an explicit government attempt to build on existing secondary businesses and skills and use direct funding and resource access to entice marginal producers to develop other alternatives and to exit from agricultural production.

Although the training and skills development aspects of the APF may appear to represent subtle change, they hold significant implications for long-term agricultural sector employment. As a result, the framework has its detractors and the criticisms include the following (NFU, 2003a, 2003b):

- The APF does not appear to be adapted to the interests of small family farms, but is more in the interest of larger operations.
- As outlined in current APF documentation, the proposed safety net programs do little to enable young farmers to move into full partnership in their family farms.

- Program components that require matched funding from the individual may act as a significant barrier to smaller operators and younger operators trying to enter the industry.
- Young farmers often do not have the production history necessary to fully utilize programs that are based on three and five year average revenues and margins.
- The “whole farm” subsidy approach penalizes farmers who diversify their operations, because the programs are oriented to one operation-wide commodity or production methods. It may also penalize farmers who cut their costs and work harder during difficult times. These characteristics may be sending the message to young and beginning farmers: diversification and adaptability will penalize them in terms of the amount of government support that they can expect to receive.

There are also concerns about the implementation of a knowledge intensity approach to agricultural training – the approach inherent in the APF training and development components, but one that is also evident in other current training initiatives.

One such concern involves the barrier represented by the continuing absence of broadband Internet access across substantial portions of the Canadian rural landscape. In addition, although recent evidence suggests that Canadian farmers have embraced the Internet to a remarkable extent, it is not clear how many farm operators and workers have the skills or computer technology to effectively take part in online learning or sophisticated searching and information exchange.

Finally, many agriculture workers may be less inclined to spend the required time to indulge in Internet learning – the incentive to take the time on the farm to engage with computer learning may be lower than that for attending a course or workshop with one’s peers. Again, the aging phenomenon has a major impact on these potential barriers, at least for the short to medium-term future.

In spite of these uncertainties, it is clear that the Internet has already significantly influenced agriculture, and this influence will almost certainly increase. As an example of the importance of the World Wide Web, It has been estimated that in 2003, 10% of the world’s 4 trillion dollar market in agricultural goods will be traded on line.

The individual-driven, support services-and–resources approach to training and skills development, as represented in the APF, appears to be widely accepted as the most effective approach. However, there is some research to support the need for continuing a broad traditional approach to training. For example, the Saskatchewan Council for Community Development (SCCD) recently released a report that includes the following findings (SCCD, 2003):

- There is current and future need for training and education to keep producers current with changes to agriculture.
- Agribusiness requires more training for managers in skills such as financial planning, marketing, communications, leadership, and human resources.

- The industry would benefit from greater partnership between colleges, universities, and training centers, and the delivery of information in ways that accommodate a greater number of producers.
- The industry and governments should cooperate in the development of a centre for agribusiness training and education – to provide services that could be accessed via the Internet or phone and allow producers to access information, resources, and contacts.
- Agricultural training programs and providers should seek alliances with training programs in other provinces.

The Increasing Importance of Biotechnology

All agricultural sub-sectors and activity classifications (primary, secondary, and tertiary) are being influenced by rapid developments in biotechnology. If there is one group of agricultural skills that appears to be in significant demand, it is those related to Biotechnology Because of its cutting edge nature and the industry's entrepreneurial atmosphere, occupations in biotechnology are especially demanding skill sets, requiring both breadth (the combination of business/management *and* applied science/engineering knowledge and skills) and depth (specific expertise within the applied sciences and engineering).

Skill Needs

The combination of technology, biotechnology, changing consumer demand, and globalization continue to have a significant impact on all aspects of the agricultural economy and the skills required by the multitude of occupations within it. Combined with a rapidly aging primary production workforce, and serious current or emerging skill shortages in other sectors, the agricultural labour market, skill development, and training situation is cause for concern. Furthermore, the current agricultural labour force situation is complex, with skill shortages and new skill needs varying across sectors. In spite of ongoing discussion of agricultural skills development on the part of government, agricultural organizations, and individual operators, there appears to be little by way of comprehensive research into agricultural skills shortages, issues, and potential solutions in Canada. However, both studies of smaller geographic areas and research focused on other agricultural economic issues have provided some insight into the specifics of skill and training needs within production agriculture.

(i) Employment, Labour Market, Training, and Skills Implications From Broader Agricultural Economic Research and Commentary From Canada and the United States

- Although not limited to agricultural businesses, participants at the Second National Rural Conference: Charlottetown Action Plan identified the development of leadership skills as a major rural priority (Rural Secretariat, 2002). The need for enhanced leadership skills in agriculture was echoed by the OATI Learning Group as one outcome of the federal shift in training policy. Their rationale was

that given the increased importance of shared knowledge and individual/community identification of training issues and needs, the role of leaders in agricultural training and skills development is more important than ever (Pletsch, 2003).

- In spite of the trend to increasing skill levels, there are still production agriculture jobs where skill requirements remain low, as in some fruit and vegetable harvesting activities. In Canada, migrant workers from Central America and the Caribbean have often filled these jobs; because the working conditions and relatively low wage rates do not appeal to Canadian workers.

- The increasing complexity with respect to the interrelationship between farm and off-farm work has prompted research interest in the definition and analysis of farm work and farm incomes.[6] Evolving farm work characteristics have also stimulated interest in changing gender roles with respect to work and income.[7]

(ii) Employment, Labour Market, Training, and Skills Implications From Previous Agricultural Economic Impact Studies in Ontario

There have been at least twenty agricultural economic impact studies conducted in Ontario since 1998, covering most of the province's counties and northern districts with significant agricultural activity. While the treatment of labour market, skills and training issues has not been entirely consistent across the studies, most have included these components in surveys of and/or focus groups with farm operators. As one might expect, given the variable importance of the various production sub-sectors, the labour market and skills related findings vary somewhat by geographic area. However, some common elements emerge from the research. These broadly similar findings include the following:

- The skills demanded of farm management personnel and labourers tend to be broadening and the diversity of skills needed within a given occupation is increasing. This diverse skill set includes computer skills and a wide range of mechanical aptitudes in such areas as welding and equipment maintenance and repair.

- Given the low profit margins, and the increasing complexity of modern farm management, farm operators prefer workers with previous farm employment experience. This desire for experienced workers is in conflict with the reality that there is a decline in the number of workers from traditional sources (i.e., – individuals who have been raised in a family farm environment).

[6] For example, see Korb, 1997 and Allen, 2001

[7] An example of a recent Canadian agriculture and gender study is *The Canadian Farm Family at Work: Exploring Gender and Generation.* In Ontario, WRED is currently conducting a study on evolving skill development needs for rural women. The article by Pamela Ferdinand also provides insight into the evolving role of women in farming in the U.S.

- Farm operators require an increasingly sophisticated set of business management skills. These include skills related to financial management/accounting, applied computer skills (e.g., business financial software, production management related software, and information management applications), and human resource management/workforce development skills and knowledge.

- In spite of recent research that suggests that the demand for computer skills in rural jobs continues to lag behind the demand in urban-based employment (Kusmin, 2002; Kusmin, 1997), computer skills are increasingly important for a wide range of occupations. This is certainly true of management positions, but the increased use of computer technology in all facets of production is driving the need for computer skills in non-management positions as well.

- The so-called "soft skills" – abilities and aptitudes that include attitude, work ethic, and interpersonal communication skills, remain high on the list of desired skills among farm operators.

A1.2.7 Agricultural Employment Summary

The number of factors influencing employment, training, and skills development is large, and the interrelationship between trends, issues, and needs is often complex. As a broad economic sector, agriculture is undergoing extensive and rapid change and, correspondingly, the employment and skills characteristics of the agricultural sub-sectors continue to evolve equally quickly. For primary production activity, some of the issues appear to be clearer than others - the rapidly aging workforce is an example. However, even this issue demonstrates complexity - there are differing opinions regarding its significance, and which (if any) interventions would be effective. When one recognizes the range of issues and the trends that are influencing modern agricultural production, it is evident that one of the most significant labour market and skills development analysis challenges is one of staying abreast of the ever-changing economic, demographic, and social conditions influencing the entire sector.

A1.3 Secondary Sector

For the purpose of this report, the secondary sector includes all those involved in the commercial preparation, processing, manufacturing, packaging, storing, wholesaling and distribution of food for human consumption. More specifically, it includes those involved in the human food components of grain and oilseed milling, sugar and confectionery product manufacturing, fruit and vegetable preserving and specialty food manufacturing, dairy product manufacturing, meat product manufacturing, seafood product preparation and packaging, bakeries and tortilla manufacturing, other food manufacturing, food related wholesaler-distributors, food related wholesale agents and brokers, and food related warehousing and storage (Statistics Canada, North American Industry Classification System).

In 2001, food, beverage and tobacco processors provided 103,500 jobs in Ontario. In 2000, the total value of shipments was 29.1 billion dollars; 20.4% came from beverages and tobacco, 18.8% from meat products, 11.3% from dairy products, 10.4% from fruit and vegetables, 9.2% from grain and oilseed milling, 7.9% from bakeries and tortilla and 7.8% from sugar and chocolate confectionery.

In 1999, large sized firms (annual sales > $200 million) produced 40% of the value of shipments, medium sized firms (annual sales between $10-200 million) 54% and small firms (< $10 million) 6% (Ontario Food Processing Research and Services Committee, 2001, p.3).

A1.3.1 Increased Specialization and Concentration

While most food preparation and processing in pioneer days occurred on the farm or in the consumer's home, these activities have been largely transferred to manufacturers over time. Manufacturers have in turn used increasingly automated and specialized processing methods in order to increase output, to expand the variety of foods available, to make quality more predictable and to lower production costs. As a result of this transition, a factory system emerged which has "encouraged increasing specialization within greater numbers of vertically linked stages of the food system" (Connor, 1997, p.51). Whereas in the past "firms operated in one or two stages of the food system and in a very few commodities, today the system is becoming much more complex starting with the involvement in biotechnology, extending through production, and ending with highly processed food. Increasingly, these firms are developing a variety of different alliances with other players in the system. Acquisition is still a common method of combining two or more firms, but mergers, joint ventures, partnerships, contracts, and less formalized relationships, such as agreements and side agreements, are also utilized" (Hefferman, 1999, p.3). While such a factory system may enhance the profitability of the conglomerates involved, there is growing concern that if a few multinational conglomerates are allowed to control each stage of production of key food items, the resulting food system will be neither equitable nor sustainable over time (Winson, 1993, p.211-212).

A1.3.2 Three Common Measures Used to Assess the Food Processing Industry

Three of the more common measures used to assess trends in the food processing industry are value added, employment and shipments value. It is Connor's view (1997, p.55) that "the best overall indicator of the economic contribution of food processing to the food system is value added. Value added for an industry is calculated by subtracting the costs of materials, containers, components, supplies, purchased fuel and energy, and certain other purchased production inputs from value of shipments. Therefore, value added includes wages salaries, fringe benefits, gross operating profits and many overhead expenses" (Connor, 1997, p.66). As value added is calculated by

subtracting the external purchases of goods and services from the industry's gross sales, it is a more realistic measure of contribution than shipments value. Employment is also useful as an indicator of the relative importance of the sector. One shortcoming of nationally available employment figures, however, is that they do not specifically identify employment related to food transportation activities – a significant figure.

A1.3.3 Income Multipliers

When considering the role played by different food processors in the food system, a broader measure of economic impact called an employment or income multiplier is often useful. Such broader gauges of impact "take into account not only the direct impact of the industry itself but also the indirect impacts on linked industries and the induced impacts on household incomes. Put another way, multipliers measure the chain reaction of an increase in investment or revenues in a certain industry on the incomes of the industry stakeholders, stakeholders in related industries, and consumers generally" (Connor, 1997, p.80).

Table A1.3 sets out 1990 estimates of income multipliers for the food processing and related industries in the United States. The first multiplier column shows the estimated direct and indirect effects on businesses only. The second column shows the total income multiplier that adds the induced effects on household income. The average 1990 food processing income multiplier of 4.2 and total income multiplier of 9.2 are "larger than income multipliers in most other manufacturing or food distribution industries. Indeed, the income multipliers of food processing are twice as high as those in such important U.S. manufacturing industries as pharmaceuticals, concrete, steel mills, televisions, motor vehicles, aircraft, and many others" (Connor, 1997, p.80). As pointed out by the Toronto Food Policy Council (1999) such "figures are national-level multipliers and caution must apply in using them on a municipal level. Provincial multipliers are lower than national multipliers and municipal ones are lower still".

Table A1.3 Income Multipliers Due to Capital Expansions in Various U.S. Food Industries, 1990

US Rank	Industry	Direct and Indirect, US	Total Income US
1	Prepared animal feeds	20.9	47.1
2	Soybean oil mills	19.7	37.6
3	Animal fats, rendering	10.7	27.3
4	Roasted coffee	12.1	25.7
5	Meat packing	6.8	25.3
6	Butter	6.8	18.8
7	Cheese	7.6	17.7
8	Prepared fresh or frozen fish	7.6	12.3
9	Fluid milk products	4.3	11.0
10	Poultry and egg products	4.8	10.4
11	Malt	3.7	10.3
12	Margarine and cooking oils	5.1	9.0
13	Sugar	4.9	8.7
14	Rice milling	4.1	8.6
15	Cottonseed oil mills	3.6	8.4
16	Ice cream	3.5	8.0
17	Sausages	3.8	7.7
18	Flour milling	3.1	7.7
19	Canned, cured seafood	3.4	6.8
20	Canned, dried milk	2.6	6.7
21	Frozen fruits, vegetables & juices	3.4	6.3
22	Wet corn milling	2.9	5.9
23	Chocolate	3.3	5.7
24	Frozen specialties	2.9	5.5
25	Confectionery	2.6	5.1
26	Canned fruits & vegetables	2.5	5.0
27	Roasted nuts	2.4	4.9
28	Potato chips and snacks	2.7	4.7
29	Miscellaneous prepared foods	2.5	4.7
30	Dried fruits and vegetables	2.2	4.6
31	Soft drink bottling	2.5	4.4
32	Flour mixes and doughs	3.4	4.4
33	Canned specialties	2.3	4.4
34	Miscellaneous vegetable oil mills	2.7	4.4
35	Pickles and sauces	2.2	3.9
36	Flavourings	2.2	3.8
37	Pasta	2.0	3.7
38	Manufactured ice	1.5	3.7
39	Pet food	2.1	3.6
40	Wine	1.7	3.3
41	Chewing gum	1.9	3.3
42	Breakfast cereals	1.2	3.0
43	Cookies and crackers	1.7	2.9
44	Beer	1.8	2.8
45	Bread, rolls, and cake	1.4	2.6
46	Distilled spirits	1.6	2.6
	Food processing average	4.2	9.2
	Other sectors:		
	Agriculture crops	1.6	4.5
	Agriculture animal products	3.7	13.9
	Farm machinery	2.7	4.0
	Wholesale trade	1.0	2.3
	Food stores	1.3	4.3
	Eating & drinking places	1.7	6.4

Source: Connor (1997, p.82)

A1.3.4 Types of Food Processing Industries

Connor (1997) suggests that the food processing industry can be categorized into three types of operations: supply-oriented, demand-oriented, and footloose types (see Table 2.4). Supply oriented industries are, "those that must locate close to sources of their major inputs because those inputs are expensive to transport or quite perishable. That is, the cost of assembling the major agricultural inputs is a relatively large share of the total cost of production." Demand-oriented industries are those in which,

> the costs of distributing finished foods … are large relative to sales….fluffy products such as bread, or perishable products such as fluid milk are examples. Distribution costs are also high because manufactures prefer the strategic advantage that derives from direct-store delivery systems: cookies, cracker and snack processors follow this practice. Profitable location requires food processing plants to locate near concentrations of retail outlets because product-distribution costs are larger than input-assembly costs. That is, demand-oriented industries will display a highly dispersed geographic pattern, such that production location will closely match population. (Connor, 1997, p. 142)

On the other hand, footloose industries,

> can site their plants across a broad region with little discernable difference in total costs of production including procurement and final-product distribution costs. In many cases, these industries utilize several different agricultural and food inputs, so determining a least-cost location is problematic…The footloose food industries tend to make products that combine several edible ingredients (e.g., frozen sausage pizza) or use expensive packaging… In recent decades, these footloose industries have displayed a number of favorable economic-growth characteristics. They are faster growing in output and employment and have higher amounts of value added relative to sales than the other two types. (Connor, 1997, p. 142)

As a result, many local governments extend considerable effort in trying to attract footloose industries.

Table A1.4 Three Locational Types of Food Processing Industries [a]

Supply-Oriented [b]	Demand-Oriented [c]	Footloose
Soybean Oil	Fluid milk	Canned specialties
Meat packing	Bread and rolls	Frozen specialties
Cheese	Ice cream	Breakfast cereals
Butter	Pasta	Four mixes and dough
Flour milling	Cooking oils & Margarine	Cookies and crackers
Rice milling	Potato chips & snacks	Frozen baked goods
Meat processing	Pickles and sauces	Sugar confectionery
Frozen seafood		Chocolate confectionery
Poultry		Nuts and seeds
Coffee rendering		Flavorings
Canned seafood		Miscellaneous foods
Processed milk		
Wet corn milling		
Canned fruits and vegetables		
Dried fruits and vegetables		
Other vegetable oils		

[a] This table is a modified version of Table 6-3 in Connor (p.142). Animal feeds, beverage related items and non-Canadian food items have been deleted

[b] These products are listed in approximate order of the ratio of agricultural-input costs to shipments value.

[c] These products are listed in approximate order of smallness of geographic distribution area (radius of shipments from plants accounting for approximately 80% of total shipments. The first three industries are very localized, with shipment radii of less than 200 miles. The next four industries have product-shipments radii of less than 500 miles.

A1.3.5 Packaging

As the number of food products increases and as pressure grows to differentiate one's products from those of the competition, the percentage of total costs going to packaging and containers in most food processing operations is increasing. The growing use of anti-tampering devises, multiple wrapping and eye catching packaging is likely to keep packaging costs, as a percentage of overall production costs, on the rise. Of the various packaging materials used by food processors, "paper (including labels and cartons) is the packaging material that processors spend the most on, followed closely by metal containers… Since the 1970s, plastic usage in food packaging has grown faster than all other types" (Connor, 1997, p.221). Generally speaking, "the cost of containers and packaging material represents about one-fifth of total material costs for the typical food processing industry. However, in 10 of the 40 food industries (in the U.S.), packaging costs exceed the costs of the edible foodstuffs purchased by processors" (Connor, 1997, p.222).

As many municipalities struggle to deal with their waste disposal budgets and the environmental challenges of properly managing their wastes, it is expected that there will be increased pressure on the food processing industry to significantly reduce the volume of packaging they use and to make greater use of materials which can be economically recycled.

A1.3.6 Wholesaling, Storage and Distribution

Connor (1997, p. 313) identifies three basic types of middlemen involved in the distribution of product from the processor to the retailer. The first type "consists of *sales divisions and branches of the food processors* themselves". The second type consists of *agents and brokers* "who mainly buy and sell products on commission as representatives of other firms, including food processors, retailers, or institutional users. Agents or brokers do not take title to or physically handle the product". The third type are *merchant wholesalers* who "buy and sell food products on their own account, and therefore take title to the goods".

While merchant wholesalers have historically played a key role, grocery store chains, as they have grown, have increasingly taken on more wholesale functions and have evolved into retail-wholesale operations. The Toronto Food Council (1996, p.4) notes that "the giant food distribution companies (owners of supermarket chains) are also the dominant wholesale food distributors in Canada, and there are only 8 food wholesalers in all of Ontario, serving an average of 952 stores each. This is 9.3 times the number of stores that a wholesaler serves in the US East Central Region."

As product is now being sourced from all over the world, significant changes are also occurring in the food distribution system. One of the more profound of these is in the distance food travels from the producer to consumer. For example, between 1981 and 1998, the average distance produce traveled by truck from locations in the continental United States to reach the Chicago terminal market increased from 1,245 to 1,518 miles – a 22% increase (Pirog, 2001, p.13). This increased usage of our transportation networks for food shipments is raising concerns over such matters as "excessive greenhouse gas emissions, smog, water pollution, air pollution from oil refineries, soil contamination and the destruction of wildlife habitats and farmlands" (Greenest City, 2002, p.1). Another concern is with the products themselves.

> If food products must travel (long distances) before they are consumed, they must be sufficiently durable to withstand shipping. But durability and shelf life are too often realized at the expense of palatability and nutritional content. The denatured, industrial tomato is but the best known exemplar of a process that has affected many fruits and vegetables (Kloppenburg, 1996, p. 5).

A1.3.7 Opportunities for Smaller Processors

The Toronto Food Policy Council (1995, p.7) suggests that,

> Following years of accepting standardization and industrialization of food, consumers are increasingly demanding of producers, processors, and distributors, foods with more taste, greater variety and more nutritional value. Associated with this is a growing market for products of local farmers and a greater desire to buy foods from the region where people live. Increasingly, consumers are associating higher quality with a reduced distance between producer and consumer. As well, the rapidly changing ethno-racial mix of the

> Ontario population has created demands for new foods processed in different ways.

Similar thoughts are presented by WCM Consultants (2002, p.11). If entrepreneurs are to be successful, however, they must,

> develop expertise in a (market) segment that is not currently being pursued by many other firms, or one that is not being served well by others…The goal is for the firm to develop some type of leadership in the specialized segment in distribution, product innovation, pricing, or product differentiation such that its market share continues to grow (Connor, 1997, p.438).

A1.4 Tertiary Sector

This sector includes all those involved in the direct sale of food, or transfer of donated food, to the consumer. Its two main components are food stores and food services.[8] Other components include a variety of direct sales initiatives, farmers' markets, the food bank and specific programs such as the "Good Food Box". Food stores are made up of grocery stores[9] and specialty food stores[10]. Food services, on the other hand, are made up of full service restaurants, limited-service eating places and special food services[11] (Statistics Canada NAICS).

In 2001, grocery stores, specialty food stores, full-service restaurants, limited-service eating-places and special food services employed 428,700 in Ontario. Of the 6,691 stores operating in that year, 500 were supermarkets, 1,821 convenience, 1,172 independents operating in major or secondary wholesale-sponsored group programs and 3,198 unaffiliated independents. Between 1991 and 2001, the total number of stores declined by 15.9%, the number of supermarkets declined by 38%, the number of convenience stores increased by 1%, the number of independents operating in major or secondary wholesale-sponsored group programs increased by 27.3% and the number of unaffiliated independents declined by 20% (OMAF Annual Food Store Statistics, Ontario, 1991-2001).

A1.4.1 Increased Concentration in Food Store Ownership

The Toronto Food Policy Council (1996, p.4) expresses serious concern with the growing concentration of ownership in the Canadian food retail system. It notes that the

[8] Also included in the tertiary sector are services that support primary and secondary agricultural activity. Examples of this activity include equipment sales and service, financial services, veterinary services, and specialized farm construction and maintenance services.
[9] Includes supermarkets and convenience stores.
[10] Includes meat markets, fish and seafood markets, fruit and vegetable markets, other specialty food stores, baked goods stores, confectionary and nut stores and all specialty food stores.
[11] Includes food service contractors, caterers and mobile food services.

> Canadian supermarket chains had 30% market share of the food dollar in 1950. This grew to 81% by 1990. Independent stores fell from 70% market (share) to 12% in the twenty years from 1970 to 1990. The top five food distribution companies in Canada account for 70% of the total food store market share.

Cotterill (2000, p. 5) has observed a similar pattern of growing retail concentration in the United States.

A1.4.2 Introduction of New Supermarket Formats

Another significant trend in the food store sub-sector is the proliferation of new supermarket formats. One of the most common new formats is the combination store - a supermarket pharmacy combination. Whereas the average conventional supermarket has a floor area of 22,500 square feet[12] and carries 12,000 items, the combination store is on average over twice as large (53,500 square feet) and carries over twice the number of items (27,000). Another format is the superstore. Superstores are often twice the size of supermarkets and offer about 23,000 items including more general merchandise and full-service departments such as bakeries, delicatessens, seafood counters, cheese shops and wine shops. A third format is the warehouse store that is similar to the supermarket but carries fewer items (7,000-10,000) and offers few services. A fourth format is a super warehouse that combines the case-lot display of a warehouse store with the multiple full-service departments of a superstore. Lastly are hypermarkets – very large supermarkets (over 100,000 square feet) with a large selection of non-food items.

Each format is designed to appeal to a particular market segment. For example, "superstores appeal to consumers who desire greater product variety and more service than is available in conventional supermarkets. Combination stores appeal to those… who like the convenience of making one trip for food, drug, and health and beauty needs. Warehouse stores appeal to consumers who desire low price over service and convenience" (Connor, 1997, p.327).

A1.4.3 Adoption of New Technology and Business Practices

In their ongoing efforts to reduce costs and increase profits, supermarkets are regularly adding new technology. Recent trends include: "expanded use of scanner data for allocating shelf space among items, tracking new items and analyzing the impact of promotion displays; the employment of Electronic Data Interchange for electronic ordering, invoicing, direct-store-delivery receiving, and other types of communication among retailers, wholesalers, and food processors; electronic shelf tags… and electronic coupon clearing" (Connor, 1997, p.332).

Two particularly significant changes in business practice are Category Management and Efficient Consumer Response. Category Management treats each grocery product category, cereal for example, as a strategic business unit. The retailer, wholesaler and

[12] This number may be closer to 40,000 sq. ft in 2003 and even larger for new supermarkets.

processor are all expected to work together to develop strategic category plans to address such matters as product mix, pricing, advertising and marketing, space management and logistics. Efficient Consumer Response is an initiative to reduce costs by having processors make direct store shipments of fast moving products, thus bypassing the wholesaler (Connor, 1997, p. 332-333).

In response to consumer time constraints, many food store have expanded store hours. Similarly, many have introduced sections "offering fresh 'home-meal replacements' such as roasted chicken, ready-made salads, cleaned and cut vegetables, and pasta buffets that are ready to serve" (Little and Bennett, 2000, p.15). As a result, the proportion of supermarket revenues earned via pre-prepared foods has increased substantially.

A1.4.4 Direct Selling – Consumer's Perspective

When asked for their main reason for visiting the Cambridge farmers' market, 96% of the respondents gave the freshness of produce as their main reason (Cummings, 1999, p.20). A similar result was obtained when other Ontario farmers markets were assessed (Cummings, 1999, p.31). Food freshness also ranked highest (32.3%) when customers of the Kitchener Farmers' Market were asked what they most liked or appreciated about that market. Other most liked features included food quality (17.6%), variety of foods (16%), vendors' (13.7%) customer services and friendliness, atmosphere (9.7%) and prices (6.3%). When 500 households in the states of Nebraska, Iowa, Missouri and Wisconsin were surveyed for their attitudes and opinions on locally grown and produced food, organic and all-natural food and meat purchasing behaviors, the "attributes most important to consumers in the region include taste, quality, nutrition/healthfulness, and price. Seventy per cent of the respondents said it was very or extremely important that their purchases support a local farm and were locally grown or produced. The respondents also showed a great deal of interest in purchasing locally grown or produced products from several different sources including the grocery store, farmers' market, local farmer (direct), and restaurants and/or cafeterias" (Food Processing Centre, 2001, p.3).

A1.4.5 Direct Selling – Farmer's Perspective

Farmers appear to be showing renewed interest in direct selling for a number of reasons.

> One is dissatisfaction with low farm-gate prices. The farm price is often only a fraction of retail food prices. Prices received for produce sold directly to consumers can be substantially higher than typical wholesale prices, yet still below supermarket prices. Small farms also often turn to direct sales because they may be snubbed by wholesalers who deal only with large-volume producers. For larger farms, direct selling can be an important sideline or a means of selling products that do not meet the quality or size standards required by wholesalers (Gale, 1995, p.19).

A1.4.6 Types of Direct Sellers

Farmers' markets are likely the oldest and most common form of direct selling. They vary considerably – "some are year round, others are seasonal: some are held in permanent indoor facilities, others are held in parking lots" (Gale, 1995, p.20). They enable farmers to sell directly to customers without going through middlemen and to determine what new products customers want most. They provide a social outlet for both vendors and customers and offer opportunities to educate the general public on where their food comes from and how it was produced. The operation of such markets, however, poses a host of challenges – who will serve on the board of directors; who will manage the market and under what terms; who can be a member and vendor; is adequate parking and display space available; are electricity, water and restrooms available, when is the market open, what products can be sold; what value added products are permitted; are arts and crafts permitted; are standard containers to be used; how will spaces be assigned; how are fees to be determined; what pricing policies apply; how are rules to be enforced; does the market meet health and safety standards for food handling and is insurance coverage in place in case of accidents or injury (Bachmann, 2002, p.1-2).

Community supported agriculture (CSA) farms are,

> arrangements whereby a group of people buy shares into the eventual harvest of a farm before the crops are planted. In exchange for their investment into the farm, shareholders receive fresh fruits and vegetables (and sometimes, other products such as local cheeses, fresh flowers, eggs and meat), on a weekly basis throughout the harvest season. By making this investment, CSA members accept part of the financial risks associated with farming. Further, the farmer receives a portion of the costs of production at a time when it is most needed (Wilkins, undated).

Various farming and marketing models along with definitions are presented below.

Subscription farming: This model is similar to the CSA model with a small exception. The consumer purchases a specific quantity of produce and once the purchase price has been met, the consumer can purchase another quantity. Therefore, this membership is based on quantity delivered as opposed to time (Goreham, 2000, p.39).

Commercial direct marketing: "Restaurants, hospitals, schools, and colleges have expressed increasing interest in purchasing local, fresh, nutritious products directly from the farm (Goreham, 2000, p.39).

On-farm marketing: The farmer sells the products grown on the farm directly off the farm. In this way, a linkage is formed between the producer and the consumer. The consumer is able to witness the food as it is taken from the land and may develop a greater appreciation for the land in the process (Goreham, 2000, p.39).

U-Pick farms: In this situation, consumers come onto the land and pick and process their own produce. After weighing the produce, the consumer pays the farmer. Not only is the cost of farm labour reduced, but also, the experiential or learning-by-doing facet is heightened and the consumer can see the interconnections between the land, the farmer, and the consumer (Wilkins, undated).

Home delivered routes: In this model, individuals deliver the products from the farm to each individual household. This model is rare because it requires a great deal of time and a delivery infrastructure by each company. It works well with meat but other products such as eggs, vegetables, fruits, and baked goods can be delivered too (Goreham, 2000, p.39).

A1.4.7 Food Services

In addition to competing amongst themselves, food stores and food services (full service restaurants, limited-service eating places and special food services) have increasingly competed against each other for consumer food dollars. Whereas one-sixth of all personal expenditures on food were spent on meals outside the home in 1961, that proportion had doubled to one-third by 1989. While growth in the food services stalled in the early 1990s, due to the introduction of the goods and services tax (January 1991) and the recession of the early 1990s, growth resumed in 1992. By 1998, the food service industry's share of the consumer market for food had reached 34.6% (Little, 2000, p.5).

While expenditures on food services are the most buoyant in times of rising disposable income and consumer confidence, other factors also play a role. "An obvious benefit of food service is the time and effort that consumers save by not cooking their own food. In recent years, this has become more important as Canadians are increasingly constrained for time. Women in particular, who have traditionally prepared most household meals, are time-constrained….Household time constraints have risen in part because more women work outside the home. From 1989 to 1998, for example, the proportion of women aged 25 to 64 who were employed rose from 62% to 66%. As a result, the time available for household tasks such as cooking has diminished, making restaurants a more attractive food option to many consumers" (Little, 2000, p.5).

Another factor behind higher food service demand may be growth in the number of single-person households. "Whereas these households comprised 23.7% of all households in 1986, this rose to 24.1% in 1996. Since single-person households tend to be more frequent consumers of food services, this may have indirectly helped the food service industry to capture a greater share of the overall consumer market for food" (Little, 2000, p.6).

A further factor behind the increase in food service spending may be the number of food service establishments now available. "In 1989, for example, the number of commercial food establishments per 10,000 Canadians was 16.5. By 1998, this proportion reached 20.7 per 10,000 people. This sharp increase serves as further evidence of heightened

competition in food services, and results in more choices available to consumers who concurrently became more demanding during the 1990s" (Little, 2000, p.6).

A1.4.8 Adoption of New Technology and Business Practices

Like food stores, food service operations have made increasing use of technology to improve productivity and reduce costs. In most fast food restaurants, for example, food can now be prepared without continual monitoring by staff. Improved mechanical processors, blenders, choppers and mixers are increasingly performing labour intensive tasks such as slicing, dicing, chopping and mixing. Software is being used to facilitate a wide variety of activities including just-in-time ordering from suppliers, electronic data interchange and payroll administration. Touch-screen monitors are being used to improve the efficiency of table servers. Drive-through and takeout facilities are being used to reduce labour requirements. Centralized phone systems are being used to make delivery services more efficient (Little, 2000, p.12).

Food service operations "have also attempted to gain market share by aggressively entering previously untapped food markets. An example of this is the rapid growth of fast-food outlets, such as those offered by hamburger chains. Miniature versions of these restaurants have increasingly sprung up in non-traditional locations such as gas stations, universities, movie complexes and professional sports venues. Moreover, in geographical areas traditionally deemed too marginal for entry by a chain, chains are increasingly agreeing to 'twinning' arrangements where complementary food service outlets… can be housed under the same roof. Such arrangements make marginal geographical areas more feasible for chains "(Little, 2000, p.15).

A1.5 The Consumer

A1.5.1 Spending on Food

The Food Bureau of Agriculture and Agri-Food Canada (2001, p.1) estimates that Canadians spent $55.8 billion in grocery stores and $29.9 billion in various foodservice outlets in 2000. Whereas Canadians spent 13.6% of their personal disposable income on food and non-alcoholic beverages in 1974, that percentage dropped to 10.9% in 1983 and an estimated 8.95% in 2000.

A1.5.2 Consumption Patterns

Over the past 20 years, per capita consumption of rice, breakfast cereals, pulses[13] and nuts, vegetable-based fats, chicken, fish, fresh fruit and vegetables, frozen vegetables, cheese, yogurt, low-fat dairy products and soft drinks have increased. During the same period of time, per capita consumption of sugar, animal fats (butter and lard), red meat,

[13] Pulses are the edible seeds of certain leguminous plants such as peas, beans and lentils.

offal[14], eggs, canned vegetables, skim milk powder, cocoa and tea have decreased. (Food Bureau, 2001, p.2).

A1.5.3 Grocery Purchases

The Food Bureau (2001, p.2) notes that, "in 1996, the average Canadian spent almost $1,625 on groceries." By 2001, this had increased to $2338 in Ontario assuming 2.2 members per average household. Purchases of red meat (16.3%), cereal and bakery products (14.8%), dairy products (13.3%) and vegetables (10%) make up two-thirds of the total. "Compared to 1982, Canadians are spending a smaller share of their grocery dollar on red meats, dairy products, fats and oils and eggs, while the largest gain in food basket share has been for prepared foods – from 4.7% in 1982 to 7.1% in 1996, reflecting the ongoing consumer demand for convenience." The bulk of these grocery purchases were made in grocery stores (81%). The remaining 19% were distributed across specialty food stores (bakeries, butchers, etc) with 8%, other stores (drug stores, department and warehouse stores, etc) with 8% and convenience stores with 3% (Food Bureau, 1999, p.8).

A1.5.4 Demand Side Economic Factors

Marcotte et al., in a 1999 study of Canadian Consumer Food Buying Trends, identifies a number of key economic factors impacting on consumer demand:

- Slow Population Growth – although Canada's population is projected to grow faster than any of the G-7 nations (1.2% annually) in the next decade, aggregate growth in the domestic market is expected to be small. The global market, however, will continue to expand offering significant export opportunities.
- Aging Population – a significant portion of the population is entering late middle age and becoming seniors. By 2016, it is projected that 44% of the population will be 45+ years of age. This graying population brings with it opportunities for those producing foods targeted at seniors.
- Disappearing "Traditional Family" – the number of single-person, one-parent and childless couples is increasingly offering a growing number of niche markets.
- Ethnic Diversity – sources of immigration to Canada have changed substantially over the years. Asia has become a major source of immigrants. Significant numbers are also coming from Central and South America, Africa and the Caribbean (Food Bureau, 2001). Each of these growing 'ethnic' populations offers unique opportunities for producers who cater to their unique tastes and traditions.
- Disposable Income – consumer spending on food service and higher value-added product purchases tends to increase when growth in disposable income exceeds growth in inflation and to decline in times when growth in disposable income is lagging.

[14] Offal are the "waste" parts cut off a carcase that are meant for food - head, heart, liver, etc.

A1.5.5 Customer Demands and Concerns

The Food Bureau, in its 2001 overview of Canadian Consumers, notes that food producers and processors face an increasingly knowledgeable and demanding consumer. Concerns needing to be addressed include: variety, quality and freshness, convenience, health and nutrition, environmental concerns, safety of the food supply, and access to information.

A1.5.6 Food Quality

In exploring the issue of food quality, Atkins and Bowler (2001, p. 191) have identified seven key dimensions:

- Flavour
- Freedom from germs. The food health scares of the last 10 years have alerted consumers to the presence of micro-organisms causing food poisoning, BSE (Mad Cow Disease), tuberculosis and a number of other diseases.
- Low in additives from the food manufacturers and residual contaminants from farming.
- Food that has been sustainably produced, for instance from organic farming without negative environmental side effects.
- From sources that can be trusted. Important here is knowledge about the origins of the food, through certification/labeling or even purchased directly from the producer. Trust may also be put in a brand.
- Knowledge of the constituents (fat, sugar, salt, etc.) and preparation, allowing the food to be consumed as part of a balanced diet.
- Miscellaneous qualitative aspects that imply quality: fresh, exotic, luxurious, expensive, highly refined, traditional."

In pursuing quality, a portion of consumers is turning directly to local producers for at least part of their food supply.

Appendix B: Economic Impact Analysis - An Overview

Economic impact is generally a measure of the impact of a sector or a project on all sectors of the economy. Economic impact analysis studies are aimed at identifying "...changes in a local economy resulting from a stimulus (positive or negative) to a particular segment of the economy" (Davis, 1990, p 5). These studies are often based on one of the several standard methodologies of regional analysis: the economic base analysis and input-output analysis (Faas, 1980, p. 4).

Economic Base Approach

Economic Base Theory maintains that economic growth is only possible if the economy's exports grow (Bradfield, 1988, p.38). The theory is based on the belief that as exporting industries expand their sales, there will be an increasing demand for inputs locally which will consequently drive local economic growth (Bradfield, 1988, p.39). In economic base theory, the economy is classified into two sectors of basic and non-basic. The basic sector includes industries that ultimately export their product out of the region. The non-basic sector is the economic activity with final sales remaining inside the region (Davis, 1990, p. 10). These are support industries that provide everything from industrial inputs to houses for basic sector employees (Higgins and Savoie, 1995, p. 66). The exporting industries are identified as basic sectors while all other industries are classified as non-basic.

According to economic base theory, exports are the engine of the local economy. It follows then that the export of goods supports all other needs of the economy (Bendavid-Val, 1991, p. 77). Economic base theory and its supporters carry the separation of basic and non-basic sectors to the point where they attempt to predict the relative impact of the basic sector on the non-basic sector. The prediction of economic impact is assessed through two economic indicators known as the economic base ratio and economic base multiplier. Economic base theory has been refined to the point where it can be questioned: "What is the overall gain in employment or income in the region associated with each gain in export sales?" (Bendavid-Val, 1991, p. 78).

This question is answered through the economic base ratio indicator and the base multiplier indicator (Bendavid-Val, 1991, p. 780). The economic base ratio calculates jobs that are theoretically created from one additional job in the basic sector. The economic base ratio is the ratio between employment in the basic and non-basic sectors and is supported by the idea of basic and non-basic employment combined equaling total employment (Bendavid-Val, 1991, p. 78). The economic base multiplier is the ratio of total employment to basic employment and indicates how many jobs in total are provided for each basic job. Thus, the economic base multiplier is the total sum of the jobs created in both sectors from one job in the basic sector (Bendavid-Val, 1991, p. 78). The economic base method is used in this study to estimate jobs in the service sector related to the basic sector of agriculture.

Input-Output Analysis

Input-Output (IO) analysis is used to measure the inter-relationships between economic activities at the sectoral, national and regional levels. Linkages are expressed by estimating the sales (outputs) from a given sector to all other sectors in the economy, and by estimating inputs from all other sectors to a specific sector. What makes the IO model so useful is its comprehensiveness, which disaggregates the economy into individual sectors (Josling, 1996, p. 5). Disaggregation permits analysis at the sectoral level, providing researchers with a close-up view of the economy. This analysis allows the researcher to assess where each sector purchases its inputs and where it sells its outputs. Such analysis is invaluable in identifying what investment will provide the greatest impact on an economy (Poole et al., 1994, p. 30).

The IO model estimates the movement of expenditures through the economy. This is traced through four different levels of expenditure: intermediate and primary suppliers, and intermediate and primary purchasers. Suppliers - intermediate and primary - purchase inputs for processing into inputs. Purchasers - intermediate and primary - buy outputs from suppliers and either use them to manufacture a product, or sell them as a final product (Bendavid-Val, 1991, p.88).

Input-output analysis has two main approaches. The Open Model allows the estimation of only the direct and indirect effects of a sector. The Closed Model estimates these, as well as the induced effects of a sector. The open model is used to trace the flow of variables between sectors of the economy (i.e. direct and indirect expenditures). The open model does not measure induced spending in the economy; expenditures on food, services and other household expenses would not be included (Davis, 1990, p. 59). The closed model is used to measure all aspects of the economy, including the direct, indirect and induced effects. Treating the household sector as a producer that sells labour to other purchasing sectors assesses induced effects (Davis, 1990, p. 59). As this study aims to measure all of the effects of agriculture on the Study Area economy, it is based on the Closed Model approach.

There are several problems associated with the IO model. The first is that it is time-specific; it takes a snapshot of the economy at a specific point in time. This model cannot account for changes in product demand or input costs, or for the introduction of new technology into the industrial sector (Davis, 1990, p. 62). Thus, the IO model does not adjust for the changing nature of the economy. A second problem of the IO model is the cost and time needed for the construction of the tables associated with this analysis. For this reason, the analysis for this study has been carried out using a survey-based "input-output-like" approach.

Multipliers

Given the previous discussion of economic base analysis and input-output analysis, the reader may question where the application of the two models leads. One of the best uses is that they allow the analyst to identify the impacts of economic changes or

shocks to a system. Essentially, what these models do is measure the multiplier effects that result from a change in the economic system. In basic terms, multiplier effects are the relationship between direct jobs produced by a project or sector and indirect and/or induced jobs caused by the direct jobs, presented in a single number (Lewis et al., 1979, p. 1). Therefore, an economic multiplier can be used to estimate the impact of change in one variable (for example, the value of agricultural production) on another variable (for example, the value of non-agricultural production). Direct employment and production in the agriculture sector will affect the rest of the economy by supporting employment in related industries as well as in the retail sector. In this way, "...a multiplication of transactions occurs in the economy by people re-spending money" (Van Hoeve, 1995, p. 66). The multipliers calculated for this research include a sales expenditure multiplier and an employment multiplier.

Appendix C: Inventory of Food-Related Companies in Waterloo Region

Company	Location	Sub-sector
1. A.W. Jantzi and Sons Ltd	Wellesley	Other food manufacturing
2. Borden Cold Storage Ltd	Kitchener	Warehousing & storage
3. Brittles 'N More	St. Jacobs	Sugar & confectionery
4. Bruce Edmeades Foodservice Dist. Inc.	Cambridge	Food wholesaler-distrib
5. Bruce Edmeades Sales Ltd.	Kitchener	Food wholesaler-distrib
6. Buonissima Fine Foods	Cambridge	Other food manufacturing
7. Cambridge Fine Foods Ltd.	Cambridge	Fruit & vegetable
8. Canada Bread Company Ltd.	Waterloo	Food wholesaler-distrib
9. Canadian Honey Ham	Cambridge	Food wholesaler-distrib
10. Canton Poultry Meat	Waterloo	Meat product mfg
11. Carmadhy's Foods Inc.	Waterloo	Other food manufacturing
12. Conestoga Cold Storage	Kitchener	Warehousing & storage
13. Conestoga Meat Packers Ltd.	Breslau	Meat product mfg
14. Country Style Meats	Wellesley	Meat product mfg
15. Crystal Cold Storage	Kitchener	Warehousing & storage
16. D.C. Foods Inc.	Waterloo	Meat product mfg
17. Dare Foods Ltd.	Kitchener	Bakeries & tortilla mfg
18. Delft Blue Inc.	Cambridge	Meat product mfg
19. Donsig Cones	Waterloo	Other food manufacturing
20. Dorels Foods Ltd.	Kitchener	Food wholesaler-distrib
21. Dover Flour Mills	Cambridge	Grain & oilseed milling
22. Eats N Meats	Kitchener	Meat product mfg
23. El Peto Products Ltd.	Kitchener	Bakeries & tortilla mfg
24. Elmira Poultry Inc.	Waterloo	Meat product mfg
25. Epicurean Foods International Inc.	Kitchener	Other food manufacturing
26. Fiedler's of Kitchener	Kitchener	Meat product mfg
27. Finest Sausage & Meat Ltd.	Kitchener	Meat product mfg
28. Flanagan Foodservice Inc.	Kitchener	Food wholesaler-distrib
29. Grainharvest Breadhouse Inc.	Waterloo	Bakeries & tortilla mfg
30. Heidleberg Meats and Deli Ltd.	St. Jacobs	Meat product mfg
31. Hergott Cider Mill	Waterloo	Other food manufacturing
32. Horizon Poultry	Ayr	Meat product mfg
33. Horse & Buggy Brands Inc.	Elmira	Other food manufacturing
34. Hostess Frito-Lay Company	Cambridge	Other food manufacturing
35. Humpty Dumpty Snack Foods Inc.	Kitchener	Other food manufacturing
36. Ingredient Supply Co. Inc./OA Li'l Spice Shack	Kitchener	Food wholesaler-distrib
37. Key Brand Foods Inc.	Kitchener	Other food manufacturing
38. Kitchener Farmer's Meat Market Ltd.	Kitchener	Meat product mfg
39. La Izalquena Import & Sales	Kitchener	Food wholesaler-distrib
40. Lancaster Cake Shoppe	Kitchener	Bakeries & tortilla mfg
41. Louro Bros. Meats Ltd.	Ayr	Meat product mfg
42. Luciani's Produce Inc.	Cambridge	Food wholesaler-distrib
43. M&M Meat Shops	Kitchener	Food wholesaler-distrib
44. Martin Mills	Elmira	Grain & oilseed milling
45. Mega Pizza/Ajay Foods – Div of 1005403 Ont Inc.	Waterloo	Other food manufacturing
46. Morrison's Meat Packers Limited	Cambridge	Meat product mfg
47. Muller's Meats Ltd.	Kitchener	Meat product mfg
48. National Grocers Co. Ltd.	Cambridge	Warehousing & storage
49. New Dominion Bakery Ltd.	Kitchener	Bakeries & tortilla mfg
50. Norris Bakery Ltd.	Kitchener	Bakeries & tortilla mfg
51. Northern Bagel	Cambridge	Bakeries & tortilla mfg
52. Oak Grove Cheese Factory Ltd.	New Hamburg	Dairy product mfg
53. Ol' Grandad's Snacks (1992) Inc.	Cambridge	Other food manufacturing
54. Osogood Meat Products Ltd.	Waterloo	Meat product mfg
55. Parmalat Canada Limited – Bakery Division	Kitchener	Bakeries & tortilla mfg
56. Pillers Sausages & Delicatessens Ltd.	Waterloo	Meat product mfg

57. Portuguese Pastry & Bakery	Cambridge	Bakeries & tortilla mfg
58. Reist & Weber Inc.	St. Jacobs	Meat product mfg
59. Rosemont Sales & Marketing	Waterloo	Food wholesaler-distrib
60. Schaaf Foods Inc.	Waterloo	Bakeries & tortilla mfg
61. Schneider Foods Inc.	Kitchener	Meat product mfg
62. Schneider Foods Incorporated	Ayr	Meat product mfg
63. Silva's Portuguese Bakery Ltd.	Cambridge	Bakeries & tortilla mfg
64. Spreitzer Meats Ltd.	Kitchener	Meat product mfg
65. Stefflers Meats Ltd.	Kitchener	Meat product mfg
66. Stemmler Meats & Cheese Inc.	Heidelberg	Meat product mfg
67. Taylor & Grant	Waterloo	Sugar & confectionery
68. The Food & Bake Shop	Kitchener	Bakeries & tortilla mfg
69. The Mill Stone	Kitchener	Grain & oilseed milling
70. Total Focus Food Service	Kitchener	Food, Bev & Tob Ag & Br
71. Vincenzo's Pasta	Kitchener	Other food manufacturing
72. Weston Bakeries Ltd.	Kitchener	Bakeries & tortilla mfg
73. Windsor Wafers – A Div of Parmalat Canada Inc.	Cambridge	Bakeries & tortilla mfg

Source: Canada's Technology Triangle's 2002 Business Directory and Scott's Ontario Manufacturers Directory 2002
Note: As the focus of the study is on food for human consumption, the Region's animal food and beverage producers are not included in this inventory.