



CANADIAN AGRICULTURAL
HUMAN RESOURCE COUNCIL

CONSEIL CANADIEN POUR LES
RESSOURCES HUMAINES EN AGRICULTURE

IDENTIFYING NEW OR EMERGING MARKETS AND OPPORTUNITIES IN AGRICULTURE

Literature Review and Industry Findings



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1 Executive Summary

Canada's farmers continue to seek out new market opportunities in response to changing consumer needs and shifting global market demands. In order for farmers to continue to grow their businesses, they must be aware of emerging market opportunities and the required skills to be successful. The New Markets and Future Skills in Agriculture project set out to investigate new and emerging market opportunities and identify the skills required by managers to be successful in these markets.

New markets were selected from the results of a literature review, which considered the Canadian perspective, producer demographics, Canadian consumer trends, global market demands, as well as market shifts underway as a result of energy and environmental opportunities and threats. Training gaps were identified by comparing the range of human resource needs for each new market opportunity against existing training opportunities offered across Canada, as listed on the Canadian Agricultural Human Resource Council's inventory database of learning programs.

Phase I identified three new or emerging market opportunities in the agriculture sector: i) End Customer-Oriented Businesses, ii) High Value Production Chains, and iii) Energy-Oriented Production Chains. Farmers engaged in these three areas are taking advantage of new opportunities to grow and diversify their operations. Phase I also produced a draft competency summary, which outlined the skills and knowledge required for each of the three markets.

Phase II further developed the competency summary by gathering information from other sectors of the Canadian economy and by reviewing competencies developed for agricultural occupations in other countries. Competencies were also extracted from course curricula related to business and agriculture. The competencies were organized into six core competency groups, which included forty-six sub-competencies or skills and knowledge areas.

The competency summary was vetted by thirty-three farmers and industry representatives through a telephone survey. The farmers' feedback indicated that the competencies reflected the skills and knowledge required to be successful in the three new markets. A gap analysis was conducted to compare the skills required for success with the skills of employers and employees in the labour market.

Competency gaps were identified in the following areas:

Interpersonal Skills	▷ Demonstrate negotiation skills (persuasive communication)
Business Management Skills	▷ Develop and implement a succession plan
Marketing Management Skills	▷ Understand basic market research
	▷ Be aware of trends in global markets
	▷ Conduct and interpret market research
	▷ Demonstrate customer service skills
	▷ Demonstrate retailing and salesmanship skills
Human Resource Skills	▷ Build and maintain relationships with customers
	▷ Develop and implement a human resource management plan
	▷ Recruit, select and hire staff
	▷ Understand procedures in hiring foreign workers
	▷ Understand compensation, benefits and employment standards
	▷ Implement workplace health and safety policies
	▷ Provide effective employee orientation
	▷ Apply an effective staff retention strategy
	▷ Monitor and evaluate employee performance
	▷ Supervise and coach employees and staff

Training programs designed to address the identified competency gaps were analyzed to determine if there were learning opportunities available and suitable to address the gaps. Both informal and formal learning opportunities were considered.

The training gap analysis revealed that there are few formal learning opportunities available for working managers. The analysis also indicated a lack of agricultural human resource management training programs. While formal learning opportunities are available at universities and colleges, they target a younger, less experienced cohort and are full time programs that do not generally appeal to the needs of the respondents. In addition, these programs do not tend to focus on topics such as human resource management and advanced business management.

This project created a greater awareness of the competencies required for three emerging market opportunities. Over the long term, the project results will be used to enhance the recruitment, training and retention of qualified workers as Canada's farms continue to adjust to changing market demands. It will also serve as a template for future projects related to competency profiles and competency development.

Based on this research, CAHRC has made the following recommendations:

Develop assessment tools for farmers to assess their own competencies

- ▷ The design and testing of assessment tools will provide producers with feedback on their competency gaps, and data will be collected to learn more about the competencies of the industry as a whole, to better design and deliver learning opportunities.

Develop competency profiles specific to each business within the new markets

- ▷ Competency profiles related to the skills, knowledge and abilities within each market, and based on the farm business tasks, will be more meaningful and applicable to farm business operators and managers. Competency profiles will not only assist producers with the recruitment of workers but will also help educators with curriculum development. In addition, they will assist in raising awareness of opportunities within the sector.

Partner with training and resource providers to enhance existing programs and resources to meet the needs of the farmer

- ▷ Enhancing learning opportunities geared to the needs of the producer will assist in mitigating the competency gaps identified by the research. The most recurring gaps were in the business management and human resource management core competencies.





2 Introduction and Background

The Canadian Agricultural Human Resource Council (CAHRC) was created to address human resource issues facing agricultural businesses across Canada. CAHRC works with industry leaders, governments and education stakeholders to research, develop and communicate solutions to the challenges in agriculture employment and skills development. CAHRC is led by industry and funded by the Sector Council Program of Human Resources and Skills Development Canada (HRSDC).

The New Markets and Future Skills in Agriculture project examined emerging market opportunities in agriculture and the skills and knowledge required for success. In particular, it identified the competencies of agriculture employers and employees in three new markets and identified the gaps in current skills development and learning programs.

The project was undertaken in two phases. Phase I comprised a literature review that examined emerging market opportunities in agriculture and the skills and knowledge necessary for managers and workers to be successful in the various markets identified. Three new market opportunities were selected for further study in the second phase of the project.

Phase II further refined the competencies (skills, and knowledge) of agriculture employers and employees in the three identified market areas. The competencies were validated by industry representatives and training gaps were identified by comparing the range of competencies for each new market against existing learning opportunities as outlined in www.agritalent.ca, an online database of learning programs, as well as from other online sources.

For the purpose of this study, a competency has been defined as the skills, knowledge or ability required to be successful in a market opportunity.



3 Literature Review

In attempting to conduct this 'literature research project,' it was noted that the reasonable realm of agriculture has exploded with new science and new opportunities.

Agriculture is now readily described as providing Food, Feed, Fuel and Fibre to its various consumers and customers. A fifth 'F' could and should be 'Feel good' as this reflects the role of agri-tourism, local foods, carbon sinks, etc. that provide a societal or individual 'feeling' above and beyond the tangible aspect of a product itself. A framework was essential in providing boundaries and direction in choosing to narrow the research down to three markets.

By the very nature of the topic itself, future oriented reports have a very short shelf life in terms of relevancy. Some literature review projects, such as a compilation of research studies on a specific production issue, could very well have strong relevance for current researchers, even though the initial research and findings were conducted 10 to 15 years ago.

It was noted that reports from a futuristic perspective, even if only a few years old, generally have content that is somewhat incomplete. To prognosticate is to make a forecast or prophesy. As such, the older a report is, the less relevant it is likely to be for this project.

For instance, in 2003, Strathcona County in Alberta commissioned a strategy report named 'The Future of Agriculture.' The report provided a very strong set of data analysis and support materials and was adopted by the county administration. Strathcona is a county representing approximately 1% of the agricultural

production of Alberta and is located immediately to the east of Edmonton. Given the close proximity to a population base of 1 million consumers, there are a number of opportunities for rural tourism, farmers markets, local foods, etc. However, these opportunities were not as prevalent in 2003 and, as such, were not highlighted in the 2003 report. Indeed, at the time, the urban nature of Edmonton was more seen as a threat, which surfaced in the report in terms of land use and 'right to farm' impacts, etc. In the report, agri-tourism was raised as an opportunity, but one with European customers as a target, as compared to local same day 'tourists.'

Furthermore, the environmental aspects we see in the marketplace today from ethanol to biomass to carbon credits were not mentioned, as for the most part, their evolution surfaced after the date of the report.

The intention is not to suggest that this particular report was flawed, but rather to highlight the inherent challenges with a future looking report.

A forward-looking approach for this project was focused more on the underlying macro trends that support market development and emergence, than a focus or prediction of any specific item in regards to future potential markets.

Thus, the report focused on the nature of the underlying macro trends and the types of implications that they probably had with

Focus on the Trends Not the Specifics!

regard to the human resources engaged in the agricultural sector in Canada.

There are great similarities in the requirements for the successful management and operation of :

- ▷ a corn maze farm, or
- ▷ a pick-your-own blueberry operation, or
- ▷ a horseback and trail riding farm, or
- ▷ a local vineyard and rural café.

Lastly, the report considered various ways to group the vast number of potential new markets and new opportunities that were present. Consideration was given to the following method of grouping the markets:

- ▷ Production orientation – new markets/ opportunities are there for livestock producers, for grains/oilseeds producers, etc.
- ▷ Market orientation – opportunities are there for export, for local consumption, etc.

However, given the purpose of the project was focused on human resource implications, it was agreed to aggregate the new markets and opportunities in terms of groups that presented similar human resource management and business strategy implications.

While the above-mentioned operations initially looked substantially different in product and target markets, the main key success factors for these operations were very similar. The skills sets of marketing, customer intimacy, and strong service orientation are all essential in these businesses.

Likewise, the management and operation of energy businesses such as anaerobic digestion, biodiesel operations and biomass production would call upon similar skills of engineering, experimentation and process controls. Marketing would likely be a less valuable skill since, in essence, the product is still a commodity.



4 Macro Economic Review

As a foundation for further analysis, the following macroeconomic materials were developed. This analysis was done on both the current state of the Canadian agriculture sector, as well as highlighting substantial changes that are underway in the global economy.

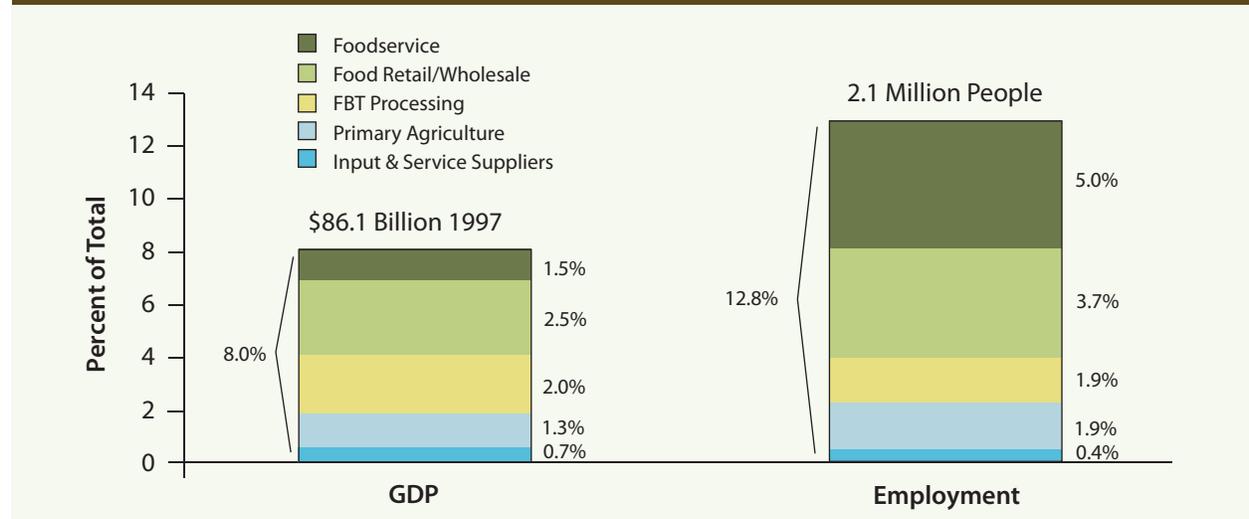
The Canadian Agriculture Sector

The agri-food sector in Canada is a vibrant component of the overall economy of the country. According to Agriculture and Agri-Food Canada, the Canadian agriculture and agri-food system accounted for 8.0% of the Canadian Gross Domestic Product (GDP) in 2005, and accounted for one in eight jobs and employed nearly 2.1 million people (Figure 1).

The overall agri-food system includes input suppliers, primary production, food and beverage processing, food retail and food service segments.

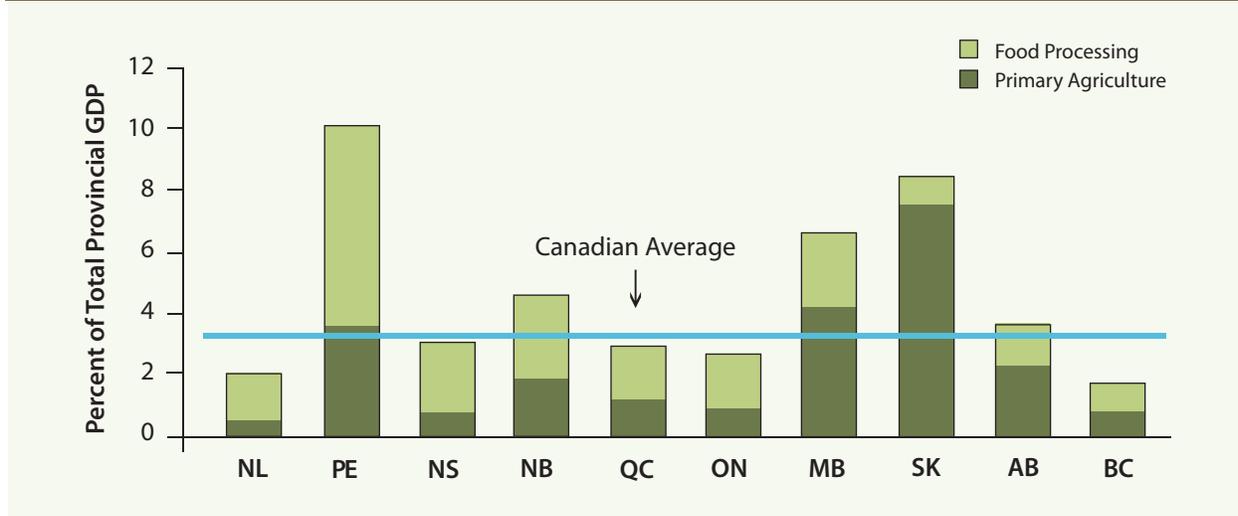
The primary production segment is a substantial employer category, directly representing 1.9% of the jobs in Canada, and also provides the material inputs for the other segments of the sector.

FIGURE 1 – Agriculture & Agrifood in Canada Contribution to GDP & Employment 2005



Source: Statistics Canada and AAFC calculations.

FIGURE 2 – Agriculture & Agrifood in Canada Contribution to Provincial GDP 2005



Source: Statistics Canada.
NOTE: Excludes beverages and tobacco processing.

However, agriculture is not consistent across the country in terms of the livestock, crops or horticultural operations that are the local norm. As Figure 2 indicates, primary production represents over 7% of the GDP in Saskatchewan – with a relatively small additional component coming from food processing. However, in PEI, the food processing component dramatically builds upon the primary production base in the province.

Still, the agriculture and agri-food sector does provide a substantial contribution to the GDP in all regions of the country.

From a net income perspective, certain segments of the sector are far less predictable than others. As such, from an overall industry perspective, there is greater volatility in the net income generated from the farm segment, which has ranged from \$128M to over \$6,133M during the past five years.

In addition, the report demonstrates a detailed analysis of the components of Total Farm Cash Receipts, (Figure 3) noting that a few segments represent a large share of 2008 total receipts:

- ▷ cattle 14%
- ▷ wheat 13%
- ▷ dairy 12%
- ▷ canola 11%
- ▷ poultry 7%

For any particular commodity, some of the year-on-year cash receipts changes are due to changes in the per unit price of the relevant commodity. Others are due to changes in the volume of production of that commodity.

For instance, soybean receipts have increased dramatically during this reporting period. A large portion of this growth can be attached to the increases in soybean acreage. Information from Statistics Canada indicates that the land used in soybean production has increased over the past 20 years, from 400,000 hectares to over 1,200,000 hectares.

FIGURE 3 – Canadian Farm Cash Receipts (\$ thousands) (Statistics Canada)

Farm cash receipts (\$ thousands)	2004	2005	2006	2007	2008
Total farm cash receipts	36,338,224	36,743,561	36,949,543	40,736,355	45,946,150
Crops	14,420,425	13,498,283	14,595,189	18,425,255	23,075,675
All wheat ¹	3,007,493	2,495,159	2,825,161	4,220,556	5,775,551
Durum wheat ¹	587,139	560,420	572,134	986,393	1,409,253
Wheat excluding durum wheat ¹	2,420,354	1,935,739	2,253,027	3,234,163	4,366,298
Oats	231,433	257,040	332,765	426,846	564,800
Barely ¹	586,233	451,642	440,613	827,086	905,230
All rye	29,457	13,050	15,913	36,557	31,511
Flaxseed	198,722	171,221	158,805	246,963	340,804
Canola	2,151,367	1,826,124	2,503,038	3,451,624	4,904,485
Corn for grain	794,416	622,774	753,676	1,048,099	1,545,159
Soybeans	630,764	760,350	679,914	1,030,131	1,125,826
Dry peas	342,672	307,136	317,865	562,747	630,682
Mustard	75,494	59,698	51,627	90,396	145,474
Sunflower	31,746	19,705	34,170	70,194	58,432
Lentils	204,998	215,939	198,339	343,917	632,991
Canary seed	54,886	39,778	46,627	76,407	110,200
Chick peas	7,295	17,113	49,784	48,641	40,881
Dry beans	151,916	155,345	153,268	165,097	195,624
Other crops ²	5,906,566	5,837,515	6,155,080	6,148,748	6,511,549
Deferred grain receipts	14,967	247,694	-121,456	-368,754	-443,524
Livestock	17,055,534	18,321,856	17,820,680	18,218,193	18,742,990
Cattle and calves	5,087,883	6,390,604	6,458,508	6,343,135	6,492,475
Pigs	4,217,338	3,888,679	3,367,854	3,280,010	3,184,517
Milk and cream	4,601,909	4,852,249	4,843,231	5,207,151	5,310,510
Sheep and lambs	84,334	110,645	132,339	128,114	123,693
Poultry and eggs	2,456,778	2,470,583	2,426,264	2,676,780	3,021,871
Other livestock products	607,292	609,096	592,484	583,003	609,924
Payments	4,862,265	4,923,422	4,533,674	4,092,907	4,127,485
Net income stabilizaion account	934,140	442,340	316,946	272,203	239,746
Crop insurance	864,528	936,376	739,100	759,117	915,302
Provincial stabilization	626,336	390,763	496,919	837,851	643,780
Other programs ³	2,437,261	3,153,943	2,980,709	2,223,736	2,328,657



This acreage increase has been supported by both advances in the seed technology and in the development of alternative markets for soybean and soybean products. For instance, soybeans are now being used to make foam for use in the manufacturing of car seats.

In addition, while it is relatively easy to view changes in the major segments of the industry, there are substantial changes underway in some of the smaller production areas.

Statistics Canada has just released a report entitled "Alternative Livestock on Canadian Farms." This report looks at livestock categories such as horses and ponies, bison, goats, elk, llamas, etc.

Within this subsector, there are some substantial changes underway in certain areas:

- ▷ Bison population has increased from 15,775 in 1991, to 195,728 in 2006.
- ▷ Emu and Rhea populations have decreased from 58,875 in 1996, to 14,451 in 2001, to 4,000 in 2006.

These two facts show the speed with which segments can emerge or decline within the Canadian agriculture and agri-food industry.

One market segment that appears to be moving from a niche market to a more mainstream market is the organic area. Supported by more and more consumer demand, and facilitated by increased 'shelf space' at the retail level the production base of organic (both certified and non-certified) is increasing substantially.

As further evidence of this evolution, both the United States Department of Agriculture (USDA) and Statistics Canada are asking more questions about the nature of the organic production in their statistics surveys. In 2006, Statistics Canada asked, for the first time, whether the operation produced organic (but not certified organic) products. In 2006, out of a total of 229,373

reporting farms, 11,937 farms reported such organic production -more than 5% of the total numberoff arms.

However, one must always be careful with the interpretation of statistics. For example, Statistics Canada reports 453,965 horses in Canada in 2006, of which 97,285 are located in Ontario. The Ontario Ministry of Agriculture Food & Rural Affairs (OMAFRA) estimates that these statistics are under-reporting by a factor of 3.9 times. As such, OMAFRA suggests that the 97,285 horses and ponies might be more accurately counted as 379,000 animals. The main difference in the number of animals seems to revolve around the definition of a farm. In many cases, smaller lifestyle oriented rural inhabitants, might have 1-2 or 5 horses but not meet the Statistics Canada definition of a farm. However, these 280,000 other horses still consume hay, grain and minerals and require veterinary services and, as such, contribute to the local agricultural and rural economy.

Likewise, the definition of agriculture is subject to periodic adjustment. In 1996 for instance, 1,593 Christmas tree farms were added to the Census. As the industry continues to evolve, our statistical bases will also need to adjust.

A conclusion from this review is that the Canadian agriculture and agri-food sector is very dynamic. The definitions and ranges of production are likely evolving faster than the census ability to track and record them. However, as a whole, the sector has not enjoyed a solid and predictable profitability base upon which to build.

Canadian Producer Demographics

Not only is the agricultural product mix in Canada changing, the producer mix is also evolving.

The number off arming operations has been on a long-term decline. Most recently, in 2006, Statistics Canada reported 229,373 farms in Canada, a 7% decline from the 2001 levels of 246,923 farms.

FIGURE 4 – Farm Numbers by Receipts Class

	2006	2001	Percentage Change
Less than \$25,000	88,392	96,570	-8.5%
\$25,000 to \$99,999	62,030	69,828	-11.2%
\$100,000 to \$249,999	39,971	46,280	-13.6%
\$250,000 to \$999,999	33,078	29,792	11.0%
\$1 million and over	5,902	4,453	32.5%
All farms	229,373	246,923	-7.1%

Source: Statistics Canada, Census of Agriculture, 2001 and 2006

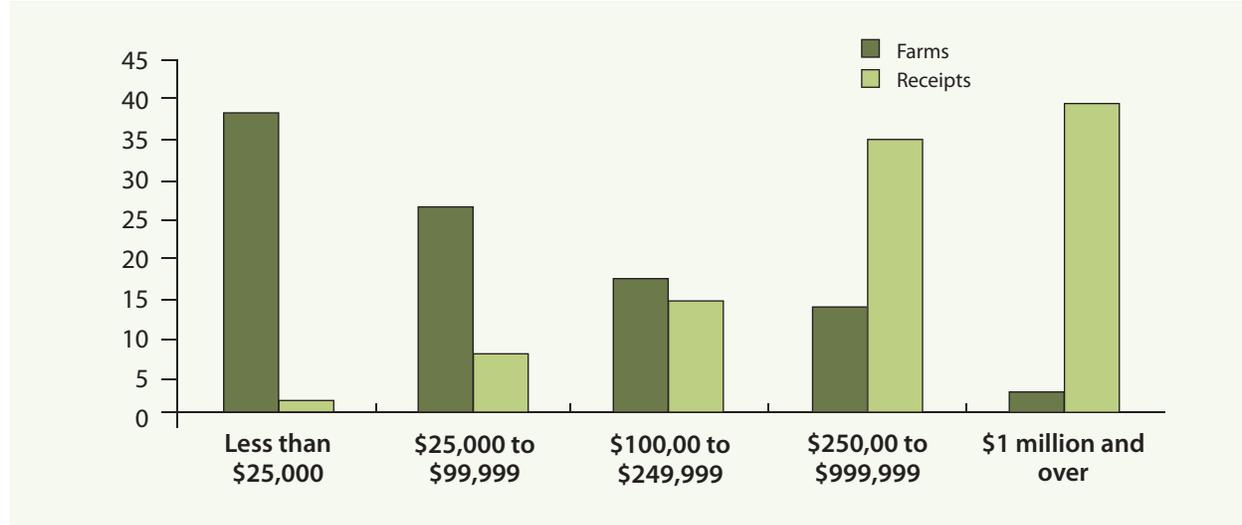
This reduction in the number of operations has coincided with an increase in the average size of the farming operation. The average farm has grown steadily and, in the 2006 census, the average farm size reported was 291 hectares.

This increase in farm scale is also evident in the revenue levels – with an increasing number of larger scale operations.

As Figure 4 outlines, the larger operations are growing in number, while smaller operations have decreased in numbers over the period 2001-2006. In addition, the number of farms with revenues in excess of \$1M in 2007, 2008 and 2009 will most likely be dramatically higher again.

As Figure 5 indicates, 'million dollar' farms are accounting for 40% of the total gross farm receipts.

FIGURE 5 – Proportion of Farms and Gross Farm Receipts by Receipts Class, Canada, 2006



Source: Statistics Canada, 2006 Census of Agriculture

Likewise, the farms with revenues in excess of \$250,000 account for over 75% of the total production in the country. As such, the bulk of our production base is in the hands of 39,000 producers.

However, the scale of operations is not the only facet changing within the producer community. For many years, the average age of producers has been increasing. This trend has been supported by increasing mechanization, which is decreasing the manual labour requirements. But it is also being driven by a reduced number of young farmers entering the industry, due to both a combination of low profitability and high capital requirements needed for entry.

Statistics Canada data indicates, the 'under 35' age category has fallen from 20% of operators in 1991 to 12% in 2001 – whereas the 'over 55' group has increased from 32% of producers to 35%. Likewise, the average age of operators in Canada rose from 49.9 years in 2001 to 52.0 years in 2006.

The situation in the US agriculture sector is similar to Canada, although a little more advanced, since the average farmer age is approximately 57 years, according to USDA statistics.

New entrants into agriculture will either need to seek innovative products or markets which might be produced on a smaller scale, or seek innovative ways to enter into large-scale agriculture.

Furthermore, older large-scale operators might be facing sufficient challenges on their time and skills in managing their existing operations and, as such, might not be interested in pursuing new products/markets or longer-term risky ventures.

These are important issues for consideration as we look forward in agriculture. The bulk of production assets are held in a few hands by owners and managers who have been focused, in many cases for decades, on growing scale and continuing to focus on their slice of the entire agriculture and agri-food sector. As such, the willingness and financial ability for some producers to explore and invest in

new areas may be lower than would otherwise be expected.

Canadian Consumer Trends

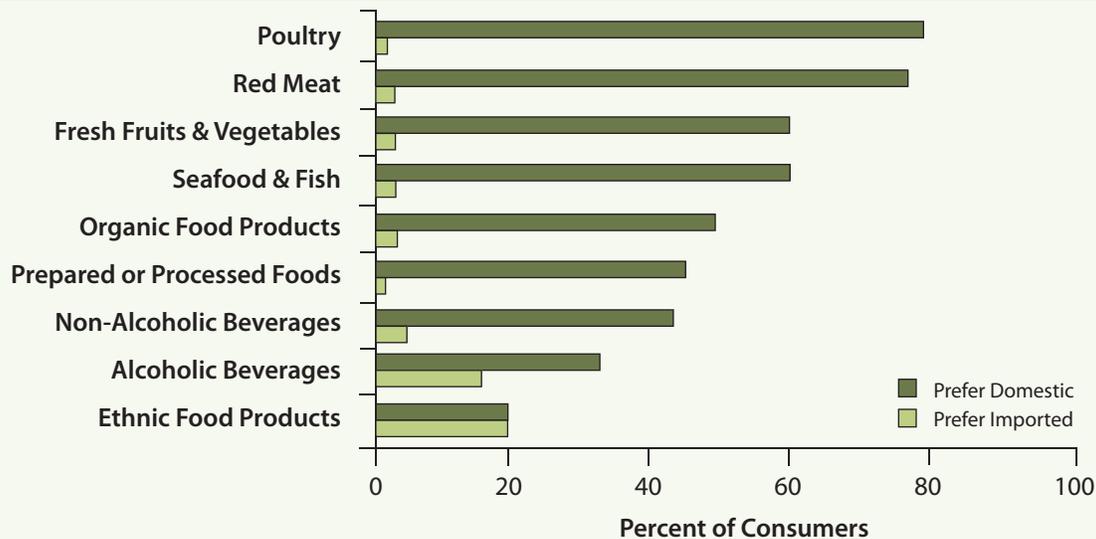
As within the production segment, there are also substantial changes in Canadian consumer demand. The average diets of Canadians are changing, both due to the increased age of the population, increased diversity, as well as an increase in the awareness of the connection between diet and health.

The Canadian population continues to grow – presently estimated at 33.5 million people. Projections from Statistics Canada suggest that the population of the country could grow to 40 million people by the late 2030's. However, this growth is not expected to be uniform across the country, as various economic conditions in the provinces will support either greater or less than average local growth rates.

This same Statistics Canada projection shows that the age mix of our population will also change: *“This rapid ageing is projected to last until 2031, when seniors would account for between 23% and 25% of the total population. This would be almost double their current proportion of 13%.”*

As a component of the country's growth, Canada has announced annual immigration limits of between 240,000 and 265,000 new residents per year. Impacted by immigration, birth rates and internal migration, the ethnic mix of Canada is changing substantially. The changing ethnic diversity of the Canadian population is also a factor that affects the food consumption mix. This increases the demand for niche products such as vegetables, spices, and other ingredients used in ethnic cooking and food preparation.

FIGURE 6 – Consumer Preferences for Buying – Imported/Domestic



Source: Domestic Branding Survey, AAFC, 2007.

However, it is also important for the Canadian producer to recognize the substantial difference in the consumer’s preference for purchasing ‘ethnic foods.’ As Figure 6 indicates, there is a noticeable difference in the consumer preferences in this category. This difference could be due to the absence of a ‘good’ domestic source of the item, or perhaps it is because the customer is more attuned to a global marketplace.

In addition, the government is a substantial initiator of change in people’s diets. The ‘Canada Food Guide’ was initiated in 1942 to help consumers in terms of nutrition and in guiding food selection. In 2002, Statistics Canada released the Canadian Community Health Survey, which showed that from 1995 to 2001, the number of obese Canadians (aged 20 to 64) grew by 24% to almost 2.8 million people.

As a result, in 2007, the Canada Food Guide received substantial changes in order to help address the health of Canadians. There is a substantial change in the recommended diets of Canadians.

There has been a substantial increase in the number of recommended servings of vegetables and fruit in the diet – increasing from a 5-10 serving range to 7-10 for adults in the new Guide.

In addition, there is a decrease in the number of servings of grains – from a maximum of 12 servings to 7-8 for adults.

While changes in the Guide will take time to affect consumers’ beliefs, habits and preferences, they will undoubtedly support a continuing shift in the direction of the diets of Canadians.

Dietary changes can be substantial over time. Over the period 1965-2005, beef consumption slipped from being the ‘dominant’ meat to a virtual ‘market share’ tie with pork and chicken. (Statistics Canada CANSIM, Table 002-0011)

This shift in consumption patterns away from meats and grains and towards vegetables and fruits could result in substantial demand changes for the production sector.



A Changing Global Market - BRIC – Brazil, Russia, India and China

It is essential to recognize that the agriculture and food industry is a global industry. The largest players in the sector from both an input perspective (Monsanto, Syngenta, DuPont, Potash Corp., John Deere etc.) and an output perspective (Cargill, Smithfield, Conagra, Bunge, etc.) are international players.

Canada is a very large exporter in both the grains (wheat & canola, etc.) and the livestock sector (beef & pork, etc.). In 2005 Canada exported over US\$20B worth of production, and imported over US\$15B worth of goods.

In the global marketplace, major changes involve the BRIC countries – Brazil, Russia, India and China. Each of these countries has large domestic populations and is becoming a larger force in the global economy.

In the 1970s, the world faced a series of threats and fears about the ability of agriculture to feed the world's population. The subsequent 'green revolution' resulted from advances in genetics,

chemistry, fertilization and irrigation techniques, which increased production levels to meet this growing, demand.

However, concerns about feeding the world's population are beginning to re-emerge, in part because of our rising global populations. As Figure 7 published by the Food and Agriculture Organization of the United Nations (FAO) indicates, the world is adding 60-70 million people per year to the population base.

Growth in population is only part of the story. In addition, the average dietary makeup is also a very important factor. As Figure 8 indicates, the world diet has improved from a base of 2,411 kcal/person/day in 1970 to over 2,800 kcal/person/day at the present time. As we look forward to the future, the FAO projects a further growth to approximately 3,000 to 3,100 kcal/person/day.

When population growth and diet improvement factors are combined, the result is a dramatic increase in the demands placed on the food production sector.

FIGURE 7 – Population Data & Projections (FAO)

	Population (million)					Growth Rates (percent per annum)			
	1970	2000	2015	2030	2050	1970-2000	2000-2030	2030-2050	2000-2050
World (UN)	3692	6071	7197	8130	8919				
World (countries with FBS)	3682	6048	7166	8091	8871	1.7	1.0	0.5	0.8
Developing Countries	2603	4731	5802	6709	7509	2.0	1.2	0.6	0.9
Sub-Saharan Africa	262	607	853	1134	1509	2.9	2.1	1.4	1.8
Near East/North Africa	183	392	521	643	774	2.6	1.7	0.9	1.4
Latin America and Caribbean	281	515	623	705	762	2.0	1.1	0.4	0.8
South Asia	708	1340	1685	1972	2208	2.2	1.3	0.6	1.0
East Asia	1169	1877	2119	2256	2256	1.5	0.6	0.0	0.4
Industrial Countries	727	905	965	1003	1019	0.7	0.3	0.1	0.2
Transition Countries	351	411	399	380	343	0.5	-0.3	-0.5	-0.4

FIGURE 8 – Per Capita Food Consumption (kcal/person/day) (FAO)

	1969/71	1979/81	1989/91	1999/01	2015	2030	2050
World	2411	2549	2704	2789	2950	3040	3130
Developing Countries	2111	2308	2520	2654	2860	2960	3070
Sub-Saharan Africa	2100	2078	2106	2194	2420	2600	2830
- <i>excluding Nigeria</i>	2073	2084	2032	2072	2285	2490	2740
Near East/North Africa	2382	2834	3011	2974	3080	3130	3190
Latin America and Caribbean	2465	2698	2689	2836	2990	3120	3200
South Asia	2066	2084	2329	2392	2660	2790	2980
East Asia	2012	2317	2625	2872	3110	3190	3230
Industrial Countries	3046	3133	3292	3446	3480	3520	3540
Transition Countries	3323	3389	3280	2900	3030	3150	3270

As noted in Figure 9, during the period 1970 to 2000, in order to have supplied the increased population and the improved diet during this 30 year period, the production sector would have had to increase production by an annual amount of 2.16%. However, looking forward, the 15-year period 2000 to 2015 will require an additional 1.52% per annum growth rate, followed by a 2015-2030 growth rate of 1.02%. While these future growth rates are a lower threshold, they may be just as hard or harder to obtain than were the growth rates of 2%+ over the past 30-40 years.

Some would argue that the 'easiest' growth in production has already been obtained by fertilization, genetics and chemistry advancements, and bringing readily available land into production.

If this is true, then additional production will be increasingly difficult to achieve.

Society will be pressuring agriculture to reduce the amount of chemical and fertilizer inputs that it consumes from an environmental cost perspective. Society is also seeking to reduce the rainforests converted into farmland. These factors will serve to suppress supply growth rates.

The demand side of the equation has not been fully presented at this point in the literature review.

Not only are the BRIC countries, and other countries, increasing in population, they are also increasing in wealth. Both India and China have large populations as well as high income growth rates and, in the case of India, a substantial population growth rate.

FIGURE 9 – Projected Demands of Food Production

	1970	2000	2015	2030	2050
kcal/day	2,411	2,789	2,950	3,040	3,130
Population (millions)	3,692	6,071	7,197	8,130	8,919
Million kcal/day	8,901,412	16,932,019	21,231,150	24,715,200	27,916,470
<i>Annual demand growth rate</i>		2.16%	1.52%	1.02%	0.31%

The income and wealth aspect is very important, since the wealthier a population becomes, the more their diet tends to switch to animal-based proteins as opposed to plant-based proteins. This is an important factor since as an example, a kilogram of chicken takes more land and energy inputs to create than does a kilogram of soybean.

When a historical assessment of the dietary mix for China is considered, there is a noticeable switch in the roles of meats and cereals in the average diet.

When income and wealth factors are combined with the population increases, the demands for productivity gains will be substantial. The implication for Canadian agriculture is that Canadians should be entering a period of sustained strong demand for home grown products.

Environment – An Opportunity and a Threat

The 'environmental' issue has risen to become one of the main societal and political issues of our time. Environmentalism has moved from a 'fringe' issue to a mainstream movement, encompassing items

such as packaging legislation, recycling programs, consumption reduction programs such as mass transit, and energy efficiency.

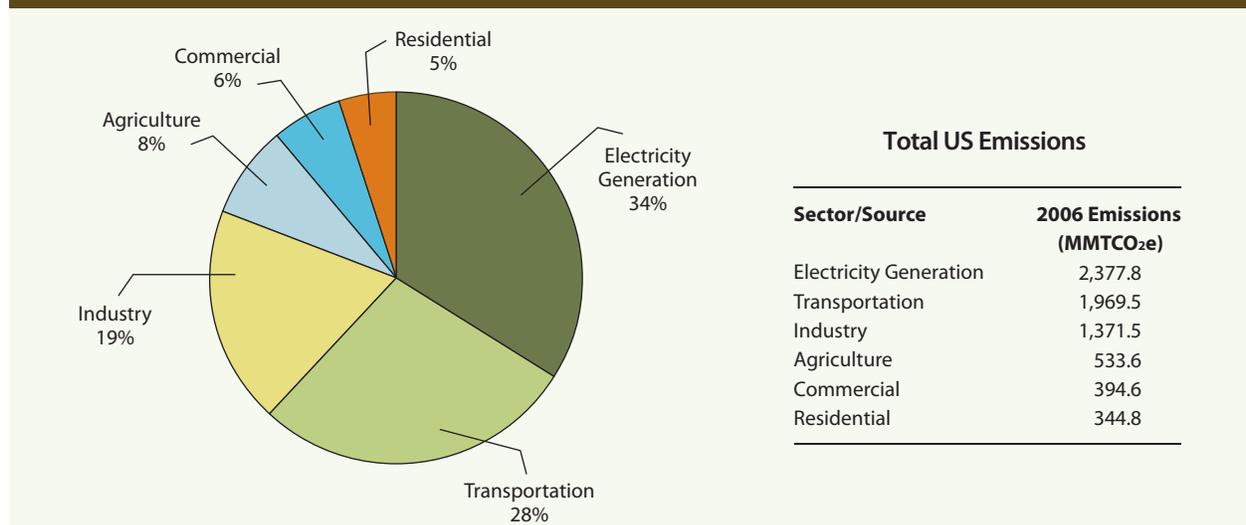
From the agriculture and agri-food sector's perspective, society's focus on the environment represents both an opportunity and a threat.

Environment Issues – A Threat for Agriculture

From a threat perspective, the increased focus on carbon emissions issues will represent a significant challenge for agriculture. As noted in Figure 10, the agriculture sector in the US is estimated to generate 8% of the total 2006 emissions in the US. Major contributors to emissions generation are from the livestock sectors and from the production and use off fertilizers on crops.

This will represent an important dilemma for agriculture. Society will simultaneously seek greater production levels to satisfy demand, while also seeking to reduce yield generating inputs.

FIGURE 10 – Total US Emissions (Department of Energy)



This may require substantial changes in the production mechanisms deployed within production agriculture. For instance:

- ▷ crop rotations might change to include more crops that fix nitrogen in the soil, in order to reduce some fertilizer needs;
- ▷ the meat diet mix might further switch towards chicken, if beef has a higher 'carbon emissions' cost per pound of meat;
- ▷ 'carbon costs' might be embedded into the input costs of fuel and fertilizer, increasing the farmers costs of production, perhaps without a corresponding increase in market value of their products.

Environment Issues – An Opportunity for Agriculture

From the opportunity perspective, the 'environmental' mindset of the consumer is helping to create a range of market opportunities for local sourcing of foods. This customer preference has surfaced in such forms as Food Miles programs, 100 mile diets, community supported agriculture (CSA), farmers markets and many others. With each of these retailing programs, the consumer is seeking a bundle of qualitative values – helping the 'family farm,' helping the local farmer, supporting rural economic development and traceability values through 'knowing' the producer. However an environmental component is also a key part of the package.

As outlined above as a threat, the 'carbon costs' of non-renewable energy can also be an advantage for agriculture. This move from a carbon economy will continue to support the ability for the producer to manufacture energy on their premises either via biomass, wind or biodiesel production. Additional details on the energy complex will be provided in Section 7 of this report.

Lastly, the land and resource base controlled by the agriculture sector provides the industry with a substantial ability to deliver solutions to carbon emissions and sequestration initiatives. In this manner, agriculture can be part of the overall solution set for climate change. This is one component of the 'societal goods and services' that are more fully examined in Section 9 of this report.

The Energy Complex

The agriculture sector has begun to see the emergence of a new type of market over the past five years: the energy complex. The energy market is the target market for a number of growing agricultural segments including ethanol production, biodiesel production, biogas facilities, wind farms, solar farms and biomass production.

To date, the demand for energy has often been tied to environmental causes. In addition to the environmental aspects, there is a true economic underpinning to the 'bio-energy' sector above and beyond an environmental incentive.

For instance, if oil was to return to US\$100 per barrel, demand for corn would escalate substantially, as corn can produce ethanol to replace the gasoline derived from oil.

As such, this section of the report will focus on the economic aspects of the energy marketplace and not review or comment on the governmental incentive mechanisms, which are subject to short-term change.

Environment Canada reports that Canada is the sixth largest user of primary energy in the world, due to our large country, our cold climate and our relatively high standard of living. They also report that the overall energy consumption of Canada has increased each year except for periodic economic recessions, which tend to reduce overall demand.



The units of measure for large scale energy issues are either Exajoules or Quadrillion Btus (British thermal units). From an equivalence perspective:

- ▷ 1 Quadrillion Btus = 1.055 Exajoules,
- ▷ 1 Quadrillion Btus = approximately 172 million barrels of oil,
- ▷ 172 million barrels of oil @US\$60 per barrel = US\$10.3 Billion

While different forms of energy have different pricing, at an oil equivalent basis, 1 exajoule would have a value in the order of magnitude of US\$10 Billion. As such, the Canadian 10 exajoule domestic energy market would have a value of approximately US\$100B – or over twice as large as the level of Canadian farm cash receipts.

To meet its energy demands, Canada relies primarily on fossil fuels. Further, Natural Resources Canada reports that the consumption level of fossil fuels in Canada continues to climb as the overall energy demand increases. Fossil fuel demand reduction programs are part of the focus of global warming containment and abatement initiatives.

The increase in energy demand that has been seen in Canada is also happening in both the developed nations, as well as the developing nations of the world.

The US Department of Energy forecasts global energy demands to increase from the rate of 510 Quadrillion Btu in 2010 to over 721 Quadrillion Btu in 2030 – this is an annual growth rate in excess of 1.7% per year. However, when we consider the country and regional details, both India and China are major contributors to the rising global energy demand. Their information predicts that China will be the largest energy marketplace in the world by the year 2030.

While current economic turmoil around the world will undoubtedly reduce 2009 and 2010 energy demands, the trend towards greater energy consumption and greater relative demands from the two large and growing economies of India and China are very likely to continue. Demand will continue to increase.

On the supply side of the energy equation, there are, of course, various opinions. One camp follows a doctrine of 'Peak Oil,' which suggests that, since fossil fuels are a finite resource, at some point the world will have reached the maximum annual production capacity. It has been suggested that the world will be reaching into less generous oil fields, harder to explore regions and will have a declining ability to produce and supply oil. Many people suggest that the world has already reached this Peak Oil point, that future production levels will actually fall each year and that there cannot be any reasonable expectations for long term growth in supply. This view also suggests a continual long term rise in oil prices to reflect the increasing relative shortage of oil.

As the world looks for new energy sources, coal, natural gas, nuclear and renewable energies will be called upon. Coal is a relatively cheap form of energy; however, coal is also threatened by the environmental aspects of its use, since its use is currently a large contributor to the emissions of CO₂. When a carbon 'tax' is applied to the base cost of coal, its relative cost advantage is dramatically reduced.

As such, we believe that there is and will increasingly be, an economic pull to use agricultural resources for the production of energy products. This has already begun in many forms across North America:

- ▷ The American Wind Energy Association reports the installation of over 28,000 megawatts of wind energy production capacity in the US (www.AWEA.org),

- ▷ The Canadian Wind Energy Association (CANWEA) reports the installation of over 2,550 megawatts of wind energy production capacity in the Canada (www.CanWEA.ca).

The CANWEA website suggests that wind energy is now supplying 1% of the Canadian electrical energy supply.

Likewise, the ethanol industry in Canada and in the US has experienced a dramatic increase in scale. Information from the Renewable Fuels Association (www.ethanolRFA.org) shows an increase to approximately 10 billion gallons of annual production capacity. The emergence of the ethanol sector dramatically increased the demand for corn across North America.

The US National Corn Growers Association indicates that over 3.6 billion bushels of corn were planned for ethanol use in 2008, representing over 30% of corn production in the US.

In 2008-2009, factors such as the global recession, falling energy prices and global credit issues were all negative elements to the ethanol sector. This resulted in construction delays, plant closures and company bankruptcies in the sector.

However, if a longer term perspective is examined, there is a notion that the pricing and demand for ethanol will return to support this sector.

A similar story can be told for the biodiesel sector, although it has not reached the same scale as ethanol in the North American market. In North America, biodiesel plants are generally based upon soybean or canola oil. However, on a global basis, biodiesel is also manufactured from palm oil and jatropha oil.

The solar energy market is also developing in terms of using solar power for heat (solar thermal) as well as for electrical production (solar photovoltaic). At the present time, this is generally a smaller segment of the energy market.

Two Ontario-based proposed projects outline the potential demands for land bases:

- ▷ Near Kingston, a 300 acre, 19 megawatt solar project has been proposed, <http://www.thestar.com/comment/columnists/article/416481>
- ▷ Near Sarnia, 900 acre, 40 megawatt solar project has been proposed. <http://www.thestar.com/article/207415>

In each of these examples (solar power, corn for ethanol, soybeans for biodiesel, palm oil for biodiesel, wind farms, etc.) the land base is being used as a primary production tool for the energy market. This reduces the 'land footprint' available for 'traditional agriculture.'

The implication for Canadian agriculture will be the continual growing importance of the energy market as a 'consumer' of agricultural production and resources.





5 Future Opportunities Resulting from Market Shifts

As discussed in Section 3 of this report, the approach used to identify ‘future opportunities’ for further study was to create groups of thematically similar opportunities. The themes for these groups were based on general similarities in the skills and knowledge needed by management and workers in business operations that would operate in these markets.

The following four future market opportunity groups have been identified that realistically represent substantial opportunities for Canadian agriculture:

- ▷ End customer-oriented businesses
- ▷ Energy-oriented production chain
- ▷ High value production chains
- ▷ Societal goods and services

In the following four Chapters, each market opportunity group will be described with supporting materials from the literature research, and an outline of an estimate of the market potential in the specific area will be provided.



6 End Customer Oriented Businesses

In this business category, a number of opportunities have been aggregated that provide a customer 'experience' as an integral and essential part of the product/service. This experience can in some cases, be explicit, such as the enjoyment received in walking through a rural corn maze. Alternatively, the experience can be more implicit, such as the enjoyment that a consumer feels by supporting local farmers through the purchase of food from a farmers market.

A term that is used in many reports is Short Food Supply Chains (SFSC) to indicate closeness between the producer and the consumer. However, the concept of end customer-oriented business models includes SFSC, but is broader in definition to also include non-food products and services. In some cases, the experience could be seen as being part of the production process (i.e. free range) or part of the delivery processes (i.e. 100 Mile Diets), or the experience could dramatically outweigh the importance of the physical good itself (i.e. corn mazes).

The consistent theme to these businesses revolves around the marketing and customer relations aspects of the operation. The products and services of these businesses are generally differentiated by aspects other than the physical components of the products themselves.

A study entitled EcoLabel Value Assessment, conducted by Iowa State University in 2003, tested a number of qualitative food aspects in regard to consumer reactions. This report outlined the difference between an actual product, a core product and an augmented product.

In applying this model to free range chicken, the actual product is chicken, the core product includes aspects such as taste and freshness; however, the augmented product includes consumer-valued attributes such as animal welfare, environmental benefits, etc. To maximize the value to the consumer, the producers need to highlight the augmented product components.

The following types of specific product and market opportunities would fit into the end customer-oriented category:

- ▷ Operation of rural tourism operations, boarding stables, vineyards, etc.
- ▷ Operation of farm gate sales enterprises, farmers markets, pick your own operations
- ▷ Operation of 'farm/farmer' branded products
- ▷ Participation in regional 'branded' campaigns

Is this a Growth Area?

There are a wide number of segments within this group, many of which are exhibiting substantial growth. A realistic concern is that some segments may be fleeting in nature and may historically be proven to have been a fad as opposed to a long-term sustainable market segment that is created from a consumer shift. This is another reason to support the approach of thematically grouping similar segments, in order to focus on the general direction of the marketplace and the resulting implications for agricultural operators. The following sections of the report will analyze in greater detail a few of these segments to highlight their current size and their potential growth.

Growth in Local Foods

One of the main growth areas revolves around the concept of 'local foods' and concepts such as Food Miles and the 100 Mile Diet, as well as the grouping of more direct marketing channels, which include:

- ▷ Community supported agriculture (CSA)
- ▷ Box schemes
- ▷ Consumer co-ops
- ▷ Producer co-ops
- ▷ Growing your own
- ▷ Farm shops
- ▷ Pick-your-own operations
- ▷ Farmers markets

Each of these channels has different specific product features and offerings for their target markets. However, they are all similar in bringing the consumer in closer connection with the producer or directly with production. Furthermore, the identity and features of the producer themselves is a key part of the offering. The more the producer can leverage and expand

upon his/her feature set, brand positioning or personification of their products, the greater the value of the product to the consumer.

As an example, in April 2009, Norfolk County (Ontario) issued a Request for Proposal in order to select a 'local foods' broker to coordinate the purchase of local foods for a 179 bed long-term care facility. The objective was to source food from within 50 kilometres of the facility. In this instance, the county, as the customer, has placed great value on the local attributes of the food.

An example of a larger scale local food movement is found in Illinois. In March of 2009, an Illinois task force (www.agr.state.il.us/newsrels/r0304091.html) suggested that the state seek a market share goal of local (Illinois state) foods of 10% by 2020 and 20% by 2030. This report suggests that such a move would add \$20-30 billion to the state economy. However, in addition, a local foods movement can also serve as a non-tariff trade barrier and adds a qualitative aspect to assist local foods to compete against imported items. Local food movements are rampant in many jurisdictions, with many local food programs dovetailing with rural tourism initiatives.

A study conducted by Iowa State University in 2003 tested a number of qualitative food attributes in regard to consumer reactions – such as price, quality, freshness, environmental aspects, etc. This particular report suggested that the principal value to the consumer was the inherent freshness of the food described as being local. This EcoLabel Value Assessment report (Iowa State 2003) suggests that the support for family farms was another great asset for the 'label'. However, the report also indicated that there were substantial differences between the interests of Midwest consumers as compared to Boston consumers.

These findings are similar to those of a study by Ipsos Reid (December 2006) that found that Canadians believe locally-grown food has

FIGURE 11 – BC Agriculture

The tremendous regional differences in BC from a climatic, geographic, economic and demographic perspective have resulted in the most diverse agricultural production of any province in Canada. This diversity provides unique opportunities to supply fresh, healthy food directly to consumers, while reducing the distance from farm to plate. Direct farm marketing and further development of local food markets can contribute to reductions in carbon emissions associated with transporting food from around the world. BC farmers are also looking increasingly beyond traditional farm enterprises to generate income. Some farmers have diversified into food processing and others are taking advantage of BC's natural beauty.

STRATEGIES:

1. Promote BC agriculture and food products at the provincial and local levels.
2. Implement initiatives to strengthen community food systems.
3. Implement initiatives to improve childhood health using BC agriculture and food products.
4. Promotion of human, plant and animal health, and food safety.

numerous benefits over 'regular' food. The study found that the majority of Canadians described the benefits of buying locally-grown fruits and vegetables as:

- ▷ Help their local economy (71% of respondents)
- ▷ Support family farms (70% of respondents)
- ▷ Taste better (53% of respondents) and
- ▷ Are cheaper (50% of respondents)

This has been highlighted in the report to indicate that it is a requirement and, indeed, perhaps a necessity for producers in this segment to conduct market research, to understand product positioning and to perpetually stay connected to the needs and wants of their audience.

In the 2007 report entitled "Growing a Healthy Future for BC Families" the BC government identified local foods as an important part of their agricultural policy (Figure 11). In this case, the agriculture policy is also connected with the

human health objectives of the government. This connection of food and health is increasingly prevalent in both provincial as well as national government strategy papers, and focuses on the nutritional advantages of fresher foods.

The local foods aspect has also manifested in the form of additional farmers markets and community shared agriculture (CSA) operations. As noted in Figure 12, the Vancouver Farmers

FIGURE 12 – The Mission of Vancouver Farmers Markets

"to foster community health and local economic development through the creation of a venue where community members have greater access to safe, healthy, locally produced, environmentally friendly food, and where BC producers can market their goods directly to urban consumers."
(EatLocal.org)

Market's mission statement also articulates the connection between the producer as the provider of safe and healthy food to their urban customer.

The Ontario Farmers' Markets association estimated total sales off armers markets in the province at \$645 million for 2005. Furthermore, it suggests sales have been growing at about 5% per year (farmersmarketsontario.com/Documents/ShopperProfile2006.pdf). These statistics correlate with Canada wide statistics offered by Farmers' Markets Canada, which projects 2008 national sales of \$1.03 billion (www.farmersmarketscanada.ca).

Another driver for producers to seek direct relationships with the consumer is to garner a greater share of the retail food dollar. According to the USDA, in 2006 the farmers' share of the retail food dollar dropped to 20 cents. The greater connection with the consumer, combined with the greater the ability for the producer to differentiate his product, can allow the producer to garner a greater share of the retail price.

However, another sub-segment of this local foods group relates to the Food Miles movement and also the 100 Mile Diet movement. A major component of this offering is that 'closer' food is more environmentally friendly. In a 2001 study by the Leopold Centre at Iowa State University entitled "Food, Fuel, and Freeways," they calculated that if Iowa consumed 10% more of its produce from local/regional sources, the fuels savings would be in the order of 280,000 to 346,000 gallons per year. However, this report also goes on to highlight that the 'miles' aspect is not a sufficient measure of the environmental footprint. Since water transport is a far more efficient mode than truck transport, a food source transported 500 miles by water may indeed have a better footprint than a food source that is trucked 80 miles to the destination.

In Europe, the discussion off ood miles is being advanced to a more sophisticated level. In 2006 the UK based Farmers Weekly magazine launched a very successful consumer targeted campaign entitled 'Local food is miles better'. While the 'food miles' concept is easily understood by the consumer, the message may indeed be erroneously simplistic.

The British Broadcasting Corporation (BBC) website is reporting now that the total footprint life cycle analysis, although more complicated, is likely the more appropriate metric to be used (http://www.bbc.co.uk/food/food_matters/food_miles.shtml). They refer to a 2005 report from the UK Department of Environment, Food and Rural Affairs (DEFRA):

"A 2005 DEFRA report indicated that it can be more energy-efficient to import tomatoes from Spain by lorry than to grow them in heated green houses in the UK. Lettuce grown out of season in the UK also compared unfavourably with Spanish salad when total carbon emissions were measured."

If the Food Miles dialogue and consumer demand continues to evolve, the consumer may begin to seek clearly defined, traceable and provable carbon footprint labeling. This would move the market segment towards what we call High Value Production Chains – where the consumer preference has moved from a personal connection with the producer, to a scientific connection to the food production system. In the UK, Tesco, a large food retailer, has joined with the Carbon Trust to determine ways to identify and label the appropriate carbon footprint of the food items (http://www.tesco.com/greenerliving/cutting_carbon_footprints/carbon_labelling.page). If this progression continues, the consumer preference could be switched to suppliers who can record, verify and minimize the carbon contribution per unit item for the whole chain. That supplier will not necessarily be local, and the local 'food miles' supplier will either have to become more sophisticated in their offering or lose that market.

This 'food miles' concept is a possible example of a fad that passes as the consumer preference evolves.

Growth in Organic Foods

The production of organic products has also been included in this segment. As outlined in Section 4, recent statistics released by Statistics Canada show a substantial increase in the number of farms reporting certified organic production from 2006 over 2001. Furthermore, the report also highlighted a larger number of operations that produce organic products but that are not engaged in a certification program.

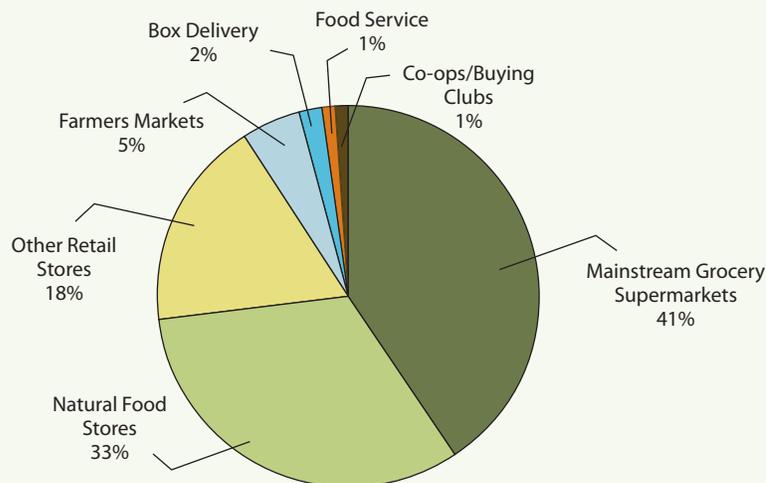
The 2006 USDA agricultural census revealed that over 20,000 farms in the US reported having some organic production. Due to this large population, the USDA is conducting a follow-up organic survey in the spring and summer of 2009. However, when compared with the Statistics Canada number of 11,937 farms with organic production, the USDA number of 20,000 seems too low.

The Canadian Produce Marketing Association reported that the 2006 organic food sales at supermarkets were 28% higher than in 2005. Likewise, the report suggests that certified organic sales topped \$1 billion in 2006.

In their May 2007 study entitled 'Retail Sales of Certified Organic Food Products in Canada', the Organic Agriculture Centre of Canada outlined a number of distribution channels used in the certified organic market. As noted in Figure 13, the mainstream grocery segment has become the dominant channel.

From a classification perspective, the organic segment could be placed into either the High Value Production Chain or the end customer oriented grouping. The organic production process does entail process definition and reporting; however, as this organic market evolves, the successful producers will have to differentiate their organic products from other organic production. This differentiation can be created either by personal connections, product branding or tight supply

FIGURE 13 – Estimates of Organic Food Sales Retail Market Channels, 2006



Source: Organic Agricultural Centre of Canada (OACC), "Retail Sales of Certified Organic Food Products, in Canada."

chain relationships. These first two strategies fit within the 'end customer-oriented' approach.

Growth in Horse segment

Another economic segment highlighted in this section of the report is the horse industry. While there are many aspects to the horse industry, as a farming enterprise, the horse segment is often omitted from agricultural reports and analysis.

Statistics Canada census numbers show that the number of horses and ponies in Canada has risen from 350,000 head to over 450,000 head during the past 20 years.

	Canada	Ontario
1981	358,122	74,986
1986	394,953	74,961
1991	356,204	75,132
1996	443,889	76,533
2001	460,569	83,337
2006	453,965	97,285

(www.statcan.gc.ca/pub/23-502-x/23-502-x2007001-eng.pdf)

However, OMAFRA suggests that Statistics Canada census surveys under represent the true Ontario horse population by a factor of 3.9. In a 2007 report, OMAFRA estimated the 2006 population of horses in Ontario to be in excess of 379,000, as opposed to the Statistics Canada census of 97,285 horses.

In Ontario, the horse population has grown by 17% over the past 5 years and by 27% over the past 10 years. In the OMAFRA study, the economic impact of the horse industry in Ontario was estimated to be over \$570 million, approximately equivalent to 50% of the revenue from the grain corn sector in the province.

The products from this segment span a range that includes entertainment (i.e. horse racing), education (i.e. training) and recreation (i.e. riding). However, major components are the emotional value, the 'feel good' aspect, and the companion animal types of relationships. A farm that boards horses and offers riding lesson is clearly a business, where the core animal husbandry component is enhanced by the experience provided by the farm operator to the riders and their families.

The horse segment has been included to highlight the challenges in defining and assessing the boundaries of the whole agricultural industry in Canada. However, as articulated in the OMAFRA report:

"Agribusiness and new entrepreneurs need to be aware of the tremendous size and economic impact of the horse industry in their county/municipality/region, so they can plan the future development of their businesses and recognize opportunities for growth."

End Customer-Oriented Businesses – Key Success Factors

The compilation of these disparate business types has been made based upon the common connection of a focus on marketing, customer intimacy and experiential focus.

Success in these areas requires that the producer and his/her team be focused on the customer and their explicit and implicit needs and wants.

This starts with a market research focus – either conducted via surveys and formal techniques or through persistent conversations with the customer. This intimacy provides the raw materials for the producer to craft their product/service offering. This is a dramatically different business model than the high volume, low cost of production business model followed by most of agriculture.

In order to be most successful in this type of a business environment, the business must be adept at:

- ▷ developing market research and interpretation skills,
- ▷ identifying, planning and executing marketing strategies,
- ▷ developing a clear product and service offering,
- ▷ developing a customer focused brand,
- ▷ developing a strong customer relationship management skill set,
- ▷ providing a focus on the 'wants' of the clientele, beyond just the core 'product,'
- ▷ developing management and staff focused on providing excellent customer experiences.

In this light, the farming organization resembles Disney, where the 'experience' of the customer is paramount. For example, the 'experience' of the family while picking 20 pounds of apples from the trees of a pick-your-own farm, is as important as the quality of the tree and the apples themselves. As such, in these types of businesses there is substantial effort spent by the producer's team on providing an 'apple' education, on providing taste testing, on collateral activities such as wagon rides, on cross selling apple pies, etc.

End Customer-Oriented Businesses – Human Resource Implications

In discussions with owners and managers in these businesses, a range of skills and abilities were identified as key success factors in both developing and in operating the business enterprise.

Many of the operators outlined that knowing the husbandry regarding the animal or crop production was critical. However, when pressed further about how they gathered their knowledge, they often cited a lack of formal education in their specific area and a reliance on self education and the 'school of hard knocks.'

Aside from the pure production related skills, marketing and customer service skills were often noted as essential. In most cases, there seemed to be no formal training or education in these areas.

A number of people indicated that a component of their sales process involved educating the consumer on the food system since the consumer has been very disconnected from production. As such, the ability to convincingly educate and inform the end customer is in many cases an attribute of success.

In general, it seemed that many of these producers were operating their business as an island, disconnected from others who were undoubtedly going through similar business challenges. This might be further entrenched by the niche nature of their product, i.e. the only alpaca farmer in the area.

The development of greater mentorship in these areas would help speed the evolution of these businesses. These mentorship skills would need to be developed in both the mentor providing guidance, as well as the skills and understanding of the people seeking mentorship.

Furthermore, the skills of the business manager in seeking collaboration and education from peers could also be developed as a business asset.





7 Energy-Oriented Production Chains

As reviewed in Section 4, the energy industry represents a very large opportunity for the agriculture industry in Canada.

However, for an individual producer, four different ways that agriculture producers can engage with these energy opportunities have been identified. These four approaches are differentiated by the level of involvement of the producer in the daily operations and the type of management involvement required.

- a) **No input based energy - Investor style engagement** – This group of energy opportunities includes those energy projects that require no daily feedstock materials – i.e. solar, wind – where no daily inputs are consumed by the process. In these types of operations, the producer would generally have marginal day-to-day involvement with the energy operations. These projects tend to be very large scale, capital intensive and complex operations. Wind farms, are very capital intensive, with \$100-250M capital budgets for larger scale 100 megawatt (MW) projects. In these cases, the normal role for the farmer would be to play a landlord role, whereby he leases portions of his land for the wind tower and associated road access. In some instances, the producer and his/her neighbours might also participate as investors in the wind project. In both of these cases, the daily involvement is likely very low on the part of the farmer, since a team of professionals would be engaged to perform preventative maintenance and to complete repair projects.
- b) **Input based energy – processing is offsite** – This group of energy opportunities include those that consume inputs in their process and the processing of these inputs is conducted at a location other than at the farmers' property. Large scale ethanol or biodiesel plants and centralized biodigestors would be included in this group. In these instances, the producer would likely have a supplier relationship to the 'facility', could possibly be an investor in the energy project, but is likely not involved in the daily operations of the processing facility. There is potential for this supplier relationship to evolve. For instance, the producer could produce specialized inputs, such as a special premium corn that is higher in starch, in order to maximize the ethanol yield per bushel. Thus, the producer is creating a special product for a specialized market use.
- c) **No input based energy - Owner style engagement** – This group of energy opportunities would include smaller scale wind and solar projects, where the farmer is the owner and operator of the facility and the connection point to the grid is likely on the farmer's lands. In these instances, the mechanical, electrical and systems knowledge requirements of the farmer or his team is quite high. However, having no input requirements on a daily/hourly basis, means that the daily management demands of such an operation should be relatively light.

d) **Input based energy – processing is onsite** – This category of opportunities represents the greatest management challenge for participating producers. Included in this category of projects would be onsite biodigestors, onsite biodiesel production and onsite ethanol production. Not only do the producer and his/her team need to have the mechanical, systems and process knowledge, but they also need to meet the logistical challenges of ‘feeding’ the processing system. In some cases, this might be watching and managing the inputs to the digester, or it could be keeping the canola bins filled for the crusher that produces oil for the biodiesel processes.

Land used = 23.4 million acres = 2.47 million hectares
 9.47 acres/hectare
 x 5.9 to 8.1 tonnes per hectare
 x 18.5 Gigajoules per tonne
 x \$6 Cdn per GJ
 = revenue potential of \$6.2 to \$8.5 B

This would make pelleted biofuels, a segment of the overall energy arena, on a revenue scale at par with wheat or canola or cattle in revenue terms for Canada.

Is this a Growth Area?

As outlined in Section 4, the energy marketplace is a very large component of our overall economy. Furthermore, some of these agricultural energy segments have already experienced substantial growth. However, there is still more growth and evolution to occur in this sector.

In a number of regions, governments have imposed legislation in terms of the green energy components consumed in their regions. This can be in terms of minimum requirements for ethanol blends and biodiesel blends. As an example, an initiative in the US seeks to set mandates for ‘renewable energies’ in order to provide 25% of all US energy by 2025. Other initiatives are calling for lower thresholds or the allowance of different components into the definition of ‘renewable’. However, in terms of scale and growth, even a 1% market share of the \$100B annual Canadian energy market is substantial.

As an example, pelleted biofuels can be used to create energy to generate electricity, heat homes, and heat and power green houses. In a 2006 report entitled “The Potential for Grass Biofuel Pellets,” Roger Sampson reported that the Canadian production capability for biomass energy pellets was in the range of \$6 to \$8 billion per year in revenue.

Energy-Oriented Production Chains – Key Success Factors

Outlined above are the four different ways that producers can become engaged in energy production. There are some Key Success Factors (KSF) that are important for each of these energy opportunities, whereas other KSF are relevant to one grouping or another.

Relationships are outlined in Figure 14.

In the No Input–Investor type opportunities, the key focus is to educate the producers to ensure that rational and sound decisions are being made and that appropriate agreements are being executed.

In the Inputs-Off Farm type opportunities, the producer is still producing a supply to the processing plant, i.e. corn, canola, wheat, manure, biomass. In these instances, the focus can be on the production process to have the highest yield, the lowest cost and the greatest certainty. The supply relationship can take many forms, such as a long-term agreement for 10 years to supply biomass, or to supply high oil yield canola for a biodiesel plant.

In the NoInputs-On Farm type of opportunities, the producer’s main challenge is to review the available technologies for their suitability to his operation and to understand the technology from a long-term support basis.



FIGURE 14 – Key Success Factors - Energy-Oriented Production Chains

	No Inputs - investor	Inputs - off farm	No Inputs - on farm	Inputs - on farm
Success Factors				
Appropriate natural resource (wind/sun/landbase, etc.)	Key Issue	Key Issue	Key Issue	Key Issue
Regulation & legislation issues	Key Issue	Key Issue	Key Issue	Key Issue
Energy understanding (terms, players, etc.)	Key Issue	Key Issue	Key Issue	Key Issue
Collaborative investments - long term partnerships	Key Issue	Key Issue	Key Issue	Key Issue
Legal contracts	Key Issue		Key Issue	
Experimentation approach		Key Issue	Key Issue	Key Issue
Marketing to customers				Key Issue
Efficiency - low cost of production for inputs		Key Issue		Key Issue
Supply chain relations		Key Issue		
Process knowledge		Key Issue		Key Issue
Electrical systems knowledge			Key Issue	Key Issue

In the Inputs and On Farm type of operations the producer is likely making the biggest time investment and management commitment. In order to make the processing aspect as efficient as possible, the producer needs to understand and support the technology and its processes. Furthermore, the producer might be involved in marketing the energy product in order to maximize the value of the product. For instance, locally produced biodiesel might have a premium value over and above other biodiesel or diesel alternatives.

Energy-Oriented Production Chains – Human Resource Implications

Participation in the energy sector does represent a substantial shift for many producers. In their normal business world, the producers have come to know their unknowns. For instance, the cash crop operator knows that they are vulnerable to drought, to frosts and to pests. The beef producer knows that she is vulnerable to disease and to fluctuating feed costs.

However, in many cases the producer does not know the relevant risk areas in these new energy markets. This can be beneficial, however, as it could be an opportunity to further instill business management skills, since more conscious thought needs to be deployed. These skills could entail developing detailed business plans, developing an investment thesis, identifying key success factors, and developing risk mitigation strategies.

As noted in Figure 15, the demands on the management skills of the producer will vary depending on the business nature of their involvement in this energy sector.

In regard to the ‘off farm’ type energy opportunities, interviews suggested that the momentum and resources provided by a co-operative initiative from many producers was critical.

FIGURE 15 – Human Resource Implications - Energy-Oriented Production Chains

	No inputs - investor	Inputs - off farm	No inputs - on farm	Inputs - on farm
Background Knowledge				
Understanding and familiarity with energy terms - Btu, GJ, MW, etc.	Applicable	Applicable	Applicable	Applicable
Systems - education on inputs/outputs of systems, process controls, etc.		Applicable	Applicable	Applicable
Regulated industries - many of the energy segments are regulated industries with substantial associated legislation	Applicable	Applicable	Applicable	Applicable
Attitudes & Skills				
Experimentation - an understanding of how to develop experimental plots, experimental procedures and processes. How do we greatly reduce the learning curve for new initiatives?		Applicable		Applicable
Partnership formation - these can be very large scale opportunities that require greater resources than any one group can provide.	Applicable	Applicable		
Risk taking - education, determination, evaluation and mitigation of risk.	Applicable	Applicable	Applicable	Applicable

Producers have traditionally been very independent business people, sometimes relying on a neighbour for a piece of borrowed equipment. However, the development of a 30-50-100 person co-operative has been a novel experience for many people. Training in how to develop and participate in multi-party partnerships and cooperatives could be of great value.





8 High Value Production Chains

In the HighValue Production Chains group, a number of opportunities have been aggregated that require the utilization of a very tightly defined production system with proven process controls. These can be scientifically differentiated products, and these processes and products are supported by data and information systems. The corporate image for this type of farm would be akin to Johnson & Johnson.

The following types of specific product and market opportunities would fit into this category:

- ▷ Production of functional foods and natural health products;
- ▷ Production of traceable foods.

In some instances, these are brand new products aimed at new markets, which could also entail new processing requirements. These products could represent an opportunity for the producer to form a larger collective or co-operative model in order to garner additional margin from further processing.

Is this a Growth Area?

The Canadian Agri-Food Policy Institute (CAPI) published a 2007 report entitled “Moving Forward on Vision and Action for Canadian Agriculture” that outlined the following vision for Canadian agriculture:

“Agriculture and Agri-Food ... Providing Solutions that Contribute to the Quality of Life of Canadians”

This report suggested that this vision would be supported by the development of the following six ‘pillars’:

The HighValue Production Chains are related to the development of pillars 1 & 2.

FIGURE 16 – Agriculture and Food - Pillars of Strategic Direction (CAPI, 2007)

1. *The health and well-being of Canadians through foods that help prevent diseases and lower health care costs associated with chronic diseases*
2. *The health and well-being of Canadians through a safe and secure food supply that guards against infectious diseases and lowers health care costs associated with acute diseases*
3. *Sustainable production practices to protect and secure the environment and natural resources such as water, land, and air*
4. *Sustainable approaches in the bio-economy producing functional foods, feed, renewable energy, fibres, and many other bio-products*
5. *Differentiation in the marketplace based on natural and climatic advantages*
6. *Attractive investment opportunities in the agriculture, agri-products & food sectors.*

In these areas, the food products will move beyond the role of providing a caloric and nutritional value and will be more effective in health maintenance, health repair and thereby improve the quality of life.

One of the other key benefits would be the possibility of reducing health care costs for the Canadian citizen and government bodies. In this manner, agriculture is impacting one of the other major industries in our economy—health care, in a preventative cost reducing manner.

Other programs, such as a US program called Healthy People 2010 (www.HealthyPeople.org), further highlight the strong correlation between dietary changes, health status and health care costs.

The production of chicory is an example of this type of opportunity. Chicory can be used as a substitute for coffee in 100 Mile Diets, but it also fits into this high value marketplace. Chicory can be further processed to yield inulin which is a prebiotic fibre which is claimed to improve digestion, help with blood sugar levels and provide other health benefits. As an example, Wellness Foods in British Columbia includes inulin in their bread products to create a functional food with health benefits for their customers.

A February 2009 article on the FoodNavigator.com site outlines further background to the inulin market opportunity.

Riding the functional food wave, food processors are increasingly adding inulin to their formulations to target the European digestive health market that analyst AC Nielsen values at about €2.2bn. According to Peters, within the nutritional functionality group, the number of products containing inulin is growing faster compared with the group as a whole.

www.foodnavigator.com/Product-Categories/Cereals-and-bakery-preparations/Sensus-highlights-cost-benefit-gains-for-inulin-enriched-bread

For the high value segment, chicory based inulin is one example of a potentially sizeable production chain that provides medicinal values. Chicory is currently at a minimal production level but could possibly evolve to support an integrated production and supply operation.

High Value Production Chains – Key Success Factors

At the present time, a large percentage of the agricultural production system is not built on an integrated supply chain model. Indeed, in a number of cases, chain players place their own needs above the needs of their downstream customer, and the values and interests of the end customer are often poorly understood.

For producers, the chicory example could represent the beginning of an integrated chain. However, the challenge is what comes first – the supply or the demand. For instance, are the market conditions and the specific customer order required first, to entice production from producers; or do producers take the lead to prove their abilities and thereby demonstrate supply availability, to encourage processing investments? Furthermore, a group of producers could aggregate their interests and resources to collectively engage in processing, product research and additional value creation.

Taking a system-wide approach to the development of these new high value markets will be both lower in risk and higher in success. There appears to be strong opportunities for producers to work together to develop and share production knowledge, to share resources and to minimize risk.

In order to be most successful in this type of a business environment, the business operators need to:

- ▷ Have a finely crafted scientific approach to production;



- ▷ Develop processes that include aspects of HACCP or Good Manufacturing Processes (GMP);
- ▷ Have internal staff or consulting access to individual skill sets such as chemists, nutritionists, or agricultural engineers;
- ▷ Place a heavy reliance on record keeping, tracking, monitoring and policing of processes;
- ▷ Develop up and down stream integrated partnerships with suppliers and customers;
- ▷ Develop multi-disciplinary teams to include finance, human resources, training, branding and marketing;
- ▷ Build long-term congruent partnerships with other producers.

High Value Production Chains – Human Resource Implications

Operators in these types of businesses demonstrated a very structured and organized demeanor and described a very detailed approach to business operations. This group described paperwork and process documentation as a ‘good thing’ and a ‘differentiator’ for their business, as opposed to a drudgery and a necessary evil of business.

As noted above, given the added complexity surrounding production, additional efforts were needed to recruit and manage thoroughness and attention to detail on the part of the team members of the organization.

Skill sets that were identified as being valuable to the creation and operation of the business included:

- ▷ Team formation – identifying the correct roles, monitoring and rewarding performance,
- ▷ Recruitment skills – selecting the best people,
- ▷ Negotiation and contracting skills.



9 Societal Goods and Services

One of the roles that farmers have performed for many years has been the custodian of the rural landscape. Increasingly, this role is being seen as one of great value to society overall, since it provides substantial environmental and ecological benefits.

These societal roles range from soil and water preservation, animal care, wildlife support and plant diversity. It is also very evident in the potential roles that agriculture can play in regard to carbon sequestration and other carbon emissions mitigation programs.

The following types of specific product and market opportunities would fit into this category:

- ▷ Operation of wetlands and conservation land programs,
- ▷ Operation of wildlife sanctuaries,
- ▷ Development of carbon emissions solutions.

Is this a Growth Area?

The New Markets for American Agriculture report published by Senators Dole and Daschle in 2007 recommended substantial increases in the size of a number of societal land use programs in the US. This report recommended an increase of \$1 billion per year, in order to ensure more lands were enrolled in the following four programs:

- CRP –Conservation Reserve Program
- WRP –Wetlands Reserve Program
- GRP –Grasslands Reserve Program
- FRPP –Farm and Ranch Lands Protection Program

The CRP program alone resulted in payments in excess of \$1.8 billion being made to land owners in 2008. The rationale for these programs is *“to advance widely supported environmental, habitat preservation and open space objectives, while creating additional income generating opportunities for farmers and maximizing potential business opportunities related to hunting, fishing and other forms of outdoor recreation.”*

Similar in objective, but potentially different in approach, the UK government is considering a mix of incentives and mandatory set aside programs in order to increase the amount of land utilized for wildlife habitats (<http://www.fwi.co.uk/Articles/2009/03/04/114586/defra-seeks-views-on-set-aside-replacement.html>). It appears as though farmers might be able to generate a defined and long-term revenue stream from this habitat support and land use governance role.

In Canada, there is a voluntary demonstration project underway entitled Alternative Land Use Services (ALUS). In Norfolk County, ALUS (www.NorfolkAlus.com) is a voluntary program where land owners can convert land for environmental purposes (improved animal habitat, new plant species, etc.) and may receive some compensation, if available, from sponsors.

However, on a larger scale, the marketplace for carbon offsets is continuing to take shape both on a domestic, as well as a global basis. Many

people believe that the agricultural sector will play a significant role in helping society to mitigate carbon emissions damages. To date in Canada, some efforts focused on aggregating carbon sequestration credits, primarily in terms of tillage benefits in western Canada, have been accomplished. In this manner, producers comply with certain production techniques designed to encourage carbon sequestration and receive payments for this compliance.

In terms of an overall carbon emissions mitigation role, the changes that agriculture can make include cropping pattern changes, input changes, and manure handling system changes.

The New Markets for American Agriculture report outlines a potential for US agriculture to sequester in the order of 260 to 810 million metric tonnes of CO₂ (MMTCO₂) per year. Depending on the value of carbon, this could represent a revenue stream in the order of \$2 - 24 billion per year.

The carbon exchange market is not yet completely mature; however, an indicative price globally (as reported by PointCarbon) is presently €15 per tonne (approximately US\$21 per tonne). At these rates, the US marketplace might represent \$5-16B per year in scale. For comparison purposes, the US corn crop has an annual revenue value in the order of \$48 billion per year.

Societal Goods and Services – Key Success Factors

For the most part, the societal goods and services marketplace is viewed as being one that is supplemental to the producers' core businesses. For instance, carbon emissions sequestration would likely require a core process that is modified or adapted in order to deliver a lower footprint or to remediate other carbon emissions. Likewise, alternative land use is likely to be relevant to only a portion of the producer's land, as opposed to the entire land base. As such, the producer will likely continue in another stream of agriculture but sees this as an additional marketplace.

For the producer, the following Key Success Factors are relevant:

- ▷ Experimentation – Being able to adjust existing processes to reduce land impact, to change input use in order to maximize the environmental benefit and the economic production potential;
- ▷ Documentation - Being able to demonstrate changes in production inputs or protocols and document compliance with the same through appropriate record keeping;
- ▷ Relevance – Becoming familiar with the concepts, terminology and objectives within the environmental space.

In addition, we believe that there are likely strong and positive ties between these societal Key Success Factors and the success that the producer could have in his/her core business. Increasingly, we observe that there are more and more frequent requirements for suppliers to have an environmental impact mitigation plan. In some cases, these are required for producers to participate in government programs. This concept of Eco conditionality is used in Quebec as a requirement for participation in certain government programs (www.fadq.qc.ca/fileadmin/cent_docu_angl/publ/clie_agri/asra/eco.pdf).

Perhaps more importantly, leading customers like Wal-Mart are making strong environmental report cards a requirement for their suppliers. The following quote is from a May 2009 Business Week article:

The scope of Wal-Mart's green goals is also without parallel. The mandate requires Chinese factories to track great volumes of data on energy use and to make it available for audits. Wal-Mart's top 200 factories have to become 20% more energy-efficient by 2012

www.businessweek.com/magazine/content/09_21/b4132044814736.htm

These types of customer demands will begin to impact the food chain and the producer base. Those producers, who have demonstrated an environmental awareness and engaged in some societally beneficial programs, are likely to have fewer challenges adapting to a customer marketplace that is more environmentally aware or environmentally demanding.

Societal Goods and Services – Human Resource Implications

Discussions with people involved in this area revealed that the 'societal' aspects were not the 'core' part of their business. The involvement of most participants appeared to be more directly related to an environmental or social conscience held by the producer.

However, in order for more producers to become aware of, interested in and involved in harnessing this potential revenue source, the following characteristics are essential to active involvement in the sector:

- ▷ Inquisitive & Innovative – The lead time for a number of these developments can be quite long. For instance, carbon credit trading is still in the relative early stages after more than 10 years of gestation. This can require early participants to be both inquisitive in wanting to understand the opportunity, as well as naturally innovative in seeking alternative ways to become engaged in the opportunity.
- ▷ Persistence – It seems that a number of projects incur a series of timing, legislative or other challenges that require substantial persistence on the part of the project proponent.

- ▷ Systems Training - It seemed that a systems wide approach to issues was prevalent. For instance the creation of a successful wetland habitat would involve the integration of a large number of different aspects. Furthermore, in the example of carbon emissions reductions, additional benefits could be available to the producer from understanding the entire life cycle and systems approach as opposed to tweaking only one element of the overall system.

Since these societal areas are likely to be supplemental to the core operational aspects of the business, it is unlikely that they will be substantial drivers to requiring new staff, new staff skills or new management skills. However, the overlap of the skills identified in this section add greater weight to the coincident identification of skills such as innovation, risk taking, experimentation and a systems approach that benefit participation in other emerging markets. As a result, this market will not be considered a priority for research in Phase II.





10 Draft Competency Summary

A competency summary outlining the skills and knowledge required for each market was drafted by gleaning information from 15 key informant interviews. Phase II of the project assisted further development of the competency summary and produced a gap analysis comparing the skills required to enter the three markets selected for further research against the current labour market.

FIGURE 17 – Draft Competency Summary	
End Customer-Oriented Businesses	
	Ability to conduct market research
	Ability to interpret market research
	Ability to carry out a needs assessment
	Ability to plan and execute marketing strategies
	Understanding of product positioning
	Understanding of product branding
	Ability to foster personal connections
	Excellent customer service skills
	Ability to educate the consumer
	Ability to learn from peers
	Ability to collaborate with others
	Entrepreneurial attitude
	Lifelong learning attitude
	People focussed
Energy Production Chains	
	Excellent business management skills
	Ability to develop and implement business plans
	Ability to prepare and implement contingency plans
	Ability to develop risk mitigation strategies
	Ability to develop and participate in multi-party partnerships and co-operatives
	Ability to establish supply chain relationships
	Excellent marketing skills
	Knowledge and understanding of legislation and regulations

FIGURE 17 – Draft Competency Summary (continued)

Knowledge of the energy sector and the partners
Entrepreneurial attitude and approach
High Value Production Chains
Ability to develop cooperatives and multi party partnerships
Ability to build partnerships with suppliers, customers and other producers
Human Resource skills
Ability to recruit and retain needed staff
Ability to Identify roles and responsibilities for workers
Ability to monitor and evaluate performance of employees
Excellent team building skills
Excellent negotiation skills
Ability to develop and implement business plans





11 Development of the Competency List

A draft competency summary of the skills and knowledge required for business success was developed in Phase I (Figure 17). The draft competency summary was enhanced to include information from a review of course outlines and learning objectives relating to each competency.

The summary was further refined and clustered based on the following assumptions:

- ▷ Employers have a base set of competencies prior to entering any of these new markets;
- ▷ The report will focus on competencies (skills, knowledge and abilities) rather than offer a “how-to guide” for those interested in entering these new markets;
- ▷ Leadership competencies are important to include as a unique core competency, even though some institutions and organizations consider leadership skills and knowledge to be part of business management;
- ▷ Human resource skills and knowledge will be included as a core competency for all markets so that managers are able to recruit and retain the staff they need;
- ▷ The term “technical/functional competencies” will be used to describe technical and production skills and knowledge, but will not be specifically described for each market. Considering there is a variety of production-related skills and knowledge required for each market, it would be impossible to accurately compile all production competencies in this report.

Based on the competency review, six core competencies in each of the three markets were developed. The six core competencies were further organized with 6-10 sub-competencies each, totalling a list of 46 in all. The core competencies were considered to be common to all three market opportunities.

FIGURE 18 – Core Competencies and Sub-Competencies

Interpersonal
1. Exhibit problem solving skills (ability to tackle complex challenges)
2. Communicate clearly and concisely (listening, speaking, writing)
3. Act as a positive team member (ability to build consensus, ability to generate co-operation)
4. Demonstrate conflict resolution skills
5. Demonstrate critical thinking skills
6. Demonstrate negotiation skills (persuasive communication)
7. Motivate employees and colleagues (ability to motivate others)
8. Understand and recognize different points of view, lifestyles and culture
Leadership
9. Create and communicate a vision
10. Develop strategic plans, set goals and priorities
11. Build effective teams
12. Delegate to others
13. Provide opportunities for others to take leadership. Empower others to deliver results.
14. Mentor and coach employees
15. Apply situational leadership
Business Management
16. Demonstrate an entrepreneurial approach
17. Develop and implement a business strategy
18. Assess and manage the economics of production
19. Implement and manage a financial management plan
20. Build partnerships with suppliers, customers and other producers
21. Develop and implement risk management plans
22. Be knowledgeable of current technology and trends
23. Develop and implement a succession plan
Marketing Management
24. Understand basic market research
25. Be aware of trends in global markets
26. Plan and execute effective marketing strategies (product positioning, branding)
27. Conduct and interpret market research
28. Demonstrate retailing/salesmanship skills
29. Build and maintain relationships with customers
30. Demonstrate customer service skills



FIGURE 18 – Core Competencies and Sub-Competencies (continued)

Human Resource Management

- 31. Develop and implement a human resource management plan
- 32. Recruit, select and hire staff
- 33. Understand procedures in hiring foreign workers
- 34. Understand compensation, benefits and employment standards
- 35. Implement workplace health and safety policies
- 36. Provide effective employee orientation
- 37. Apply an effective staff retention strategy
- 38. Monitor and evaluate employee performance
- 39. Supervise and coach employees
- 40. Provide staff training

Technical/Functional

- 41. Understand and manage production systems
- 42. Knowledge and understanding of technology trends and innovation
- 43. Knowledge and understanding of legislation, regulations and policies
- 44. Computer and information technology skills
- 45. Implement best management practices related to commodity produced
- 46. Able to seek out and obtain expert advice and assistance as required



12 Identifying Competencies in the Current Labour Market

Methodology

A questionnaire was developed to validate the competencies (Appendix B). Employers and industry experts were interviewed to determine how they would rank each sub-competency in terms of the importance to their business success. Importance was ranked on a scale of 1 (extremely unimportant) to 5 (extremely important).

Telephone interviews were conducted from January 25 to February 12, 2010. The sample was compiled by gathering contact information for businesses involved in the three markets as well as through referrals from the project advisory group.

Respondents were also asked if they or their employees had the skills and knowledge identified in the competency summary. If yes, they were also asked to describe how they gained the skills and knowledge; whether through formal or informal instruction. If respondents indicated that they or their employees were not competent in a particular skill or knowledge area, they were asked to describe how they might prefer to gain these skills; either formally or informally. It should be noted that the survey did not ask about the respondents' interest in improving their skills or desire for additional education/training. It focused on the preferred means to upgrading skills.

Supplementary questions about the nature and size of the interviewee's business were included, as well as the length of time the respondent had been in business.

Responses were analyzed according to the three new markets. Information gathered was examined based on the number of employees in the business. For the purpose of this report, businesses with fewer than 9 employees were labelled as smaller businesses; and those with more than 9 employees were labelled as larger.

Results and Analysis

Thirty-three individuals were interviewed by telephone or email. Given the sample size, the data should be considered indicative, not representative of the three markets. Approximately one-third of the respondents were engaged in businesses in each of the three markets. Respondent information regarding location, product produced and number of employees (a representation of business size) is presented in Appendix C. Importance rankings for each of the competencies are presented in Appendix D.

The analysis was carried out to identify those competency areas where managers revealed that their skills and knowledge were less than ideal. Competency gaps were identified when more than 25% of the respondents indicated they were not competent in a particular sub-competency.

Managers and Employees

As the sub-competencies may have been more applicable to manager positions, the interviews focussed mainly on the competencies of the employer/manager. Respondents indicated that it was difficult to evaluate their employees and, as a

result, often identified their employees' skills as being variable. Respondents were relatively uncritical of their own abilities and skills, generally answering "Yes" when asked if they possessed the skill or ability in question. Respondents tended to rank the skill as less important if they did not see themselves as proficient. As a result, many of the competencies ranking lower in importance may have been a reflection of the respondents' assessment of their own abilities rather than an assessment of actual importance to the success of the operation.

Business Size

In general, responses from larger and smaller businesses differed. Larger businesses tended to view the importance of all skills as more critical to their success than did the smaller businesses. Across all markets, larger enterprises were more committed to upgrading the skills of their employees than smaller businesses, and were also more likely to support education in the form of short courses, conferences, workshops and seminars.

Some human resource competencies were ranked as less important by smaller businesses. For example, while small operations occasionally needed to hire staff, the competencies associated with recruiting and selecting employees were ranked as less important since they were required less frequently.

Analysis by Market Area

A - End Customer-Oriented Businesses:

Businesses identified as being part of the end customer-oriented market ranked negotiation skills as less important than did markets B and C. Similarly, they also considered business management skills and knowledge to be less important in terms of the success of the business than did respondents from markets B and C. Farmers from the endcustomer-oriented businesses considered the development and implementation of a succession plan to be important but expressed a lack of knowledge in this area.

B - Energy-Oriented Production Chains

Human resource skills in general were ranked as very important to businesses in the energy-oriented production chains with the exception of very low importance placed on hiring foreign workers. Most of the respondents in this market represented larger operations and, therefore were more likely to have staff dedicated solely to human resource functions. Supervising and coaching employees was also ranked as more important to this market and to businesses in markets A and C.

C- High Value Production Chains

Respondents from high value production chains rated recruitment and retention as less important than markets A and B. It is not surprising that recruitment and retention are seen as less important to this market, considering the businesses interviewed in this market had fewer employees on average than did the other markets. Respondents from the high-value production chains placed greater importance on succession planning than did respondents from markets A and B. Retail and salesmanship skills were not viewed as important for this market compared to the respondents from the markets A and B.



13 Gap Analysis for Each of the Core Competencies

Interpersonal Skills

The interpersonal skills sub-competencies were ranked as very important for managers and often less so for employees. Respondents indicated the need for additional learning opportunities such as short courses and in-house training related to interpersonal skills. Training opportunities in this competency were supported more often by larger businesses, because there are more employees to cover for those who are engaged in training.

Respondents indicated that they and their employees were quite skilled in communicating clearly and concisely. One respondent indicated that good interpersonal skills were a prerequisite to employment whenever the job description involved dealing with customers. In addition, base levels of interpersonal skills were expected from all employees as a prerequisite to teamwork and workplace harmony. Most respondents indicated that they and their employees picked up communication skills on the job. In cases where improvement was required, respondents further indicated that their preferred method of upgrading these skills was through on-the-job training or short courses.

Not everyone interviewed thought that conflict resolution skills were important to their business success. One respondent indicated that he works alone, underlying that there was no need for conflict resolution skills. Several comments from respondents indicated that a higher skill level in conflict resolution was required for managers than would be required for workers.

Managers that were interviewed ranked critical thinking skills as important for themselves and less important for their employees. The respondents from farm businesses requiring workers to perform more repetitive and routine tasks also indicated that this competency was unimportant.

Managers viewed negotiation skills as very important or higher for themselves, although they viewed this skill to be of lesser importance for their employees. Several respondents interpreted this question in the context of the internal operation and did not consider the external aspects of dealing with the public and customers in their assessment. One of the respondents referred to his operation as a solo enterprise, not requiring negotiation or people skills; however, he changed his response when he realized that he interacted with others regularly at farmers' markets and through participation in other co-operative ventures.

Many respondents indicated that the ability to motivate others was very important, although some managers from smaller operations indicated that this skill was of lesser importance to their businesses. These respondents also expressed less of an interest in skills upgrading than did others. Respondents generally expressed that problem solving skills and recognizing and understanding different lifestyles and cultures were important skills and that they and their employees were competent in these areas.

FIGURE 19 – Interpersonal Skills

	Number of respondents who currently have competencies	Number of respondents who currently do not have competencies
Communicate clearly and concisely (listening, speaking, writing)	28	5
Act as a positive team member (ability to build consensus, ability to generate cooperation)	28	4
Demonstrate conflict resolution skills	27	6
Demonstrate critical thinking skills	26	7
Demonstrate negotiation skills (persuasive communication)	23	10
Motivate employees and colleagues (ability to motivate others)	28	5
Understand and recognize different points of view, lifestyles and culture	28	5
Exhibit problem solving skills (ability to tackle complex challenges)	28	5

N=33 Totals may not equal 33 due to non-responses

Leadership Skills

Commonalities were apparent with respect to how leadership is perceived among respondents from small operations in this research. While some viewed leadership as an important component of the enterprise and an important aspect of their relationship with their staff, employees and family members, other respondents did not seem to feel this was important as they did not have employees. (i.e. one does not require leadership skills unless there are staff to lead.) This raises the question, “Do owners not need leadership skills because they manage few people, or do businesses not grow beyond a small number of employees because managers do not possess the leadership skills and knowledge necessary to expand?”

Some respondents indicated that they did not consider building effective teams, delegating to others, empowering others and acting as a coach or mentor as being especially important to their operations.

None of the respondents indicated they had received formal leadership training, while all respondents indicated that they were skilled

as leaders; and, in the strict sense of the word they were in fact ‘leading.’

Virtually all respondents considered themselves as possessing skills and knowledge in all areas of the leadership competency. While leadership was considered an important skill for managers, many respondents indicated that leadership skills were not so important for workers. However, several managers expressed a desire to see the development of more leadership skills within their organization.

Respondents indicated that developing strategic plans, setting goals and priorities are very important for managers but not for employees. Several respondents indicated that they were not sufficiently senior within the organization to be aware of this process. Some of the smaller operations didn’t think this form of leadership to be especially important.

Some respondents ranked building effective teams as very important although several of the small operators felt that this competency was less important, suggesting that they did not perceive theirs as being a “team” enterprise.

FIGURE 20 – Leadership Skills

	Number of respondents who currently have competencies	Number of respondents who currently do not have competencies
Create and communicate a vision	29	4
Develop strategic plans, set goals and priorities	28	5
Build effective teams	29	4
Delegate to others	25	5
Provide opportunities for others to take leadership. Empower others to deliver results.	27	6
Mentor and coach employees	25	7
Apply situational leadership	28	4

N=33 Totals may not equal 33 due to non-responses

Business Management

Some business management skills were rated as being very important to extremely important. However, risk management and succession planning were ranked as substantially less important than the other competencies by many respondents. This observation was consistent across all three market opportunities. It is perhaps also revealing that most of the respondents indicated that they had no formal business management training.

Respondents from larger operations considered an entrepreneurial approach to be more important than did those from smaller operations. The respondents in the end customer-oriented market ranked this competency as less important to business success than did respondents from the other two markets.

Almost all respondents agreed that developing a business strategy, as well as implementing a financial management plan, was extremely important. Respondents generally indicated that they could use help in assessing the financial health of their business.

It appears that there is a variation among the respondents in understanding the term 'risk management planning'. Many respondents indicated that they do not see risk management planning to be important to their business success. Many smaller business managers responded that they do not engage in some of the risk management and mitigation strategies (insurance, hedging, etc.) typically available to farmers.

Respondents generally indicated that knowledge of current technology and trends was important to their business success. While there appears to be some interest in improving skills and knowledge in these areas, there is recognition among some farmers that this area is constantly changing and that keeping current requires an on-going effort.

Responses from farmers of end customer oriented businesses considered the development and implementation of a succession plan to be important. These respondents also expressed a lack of knowledge in the area. As most of the operations in the energy production chains market were structured as corporations, it is possible that the process of succession planning has been largely addressed through the share structure of the corporation. There was no consistency in the responses among respondents in the high value production chains market area, indicating that, for some, business planning was important while, for others, it was not.

FIGURE 21 – Business Management

	Number of respondents who currently have competencies	Number of respondents who currently do not have competencies
Demonstrate an entrepreneurial approach	24	7
Develop and implement a business strategy	23	6
Assess and manage the economics of production	24	5
Implement and manage a financial management plan	24	7
Build partnerships with suppliers, customers and other producers	25	6
Develop and implement risk management plans	22	7
Be knowledgeable of current technology and trends	26	8
Develop and implement a succession plan	17	9

N=33 Totals may not equal 33 due to non-responses



Marketing Management

There appeared to be a divergence of both perceived importance and skill level within this competency category. The majority of respondents did not have formal training in marketing, particularly in conducting market research. Also, there was an expectation that associations and government departments are mandated to promote the industry and are better equipped to provide market research services and information than individual businesses.

Producers recognized the need for customer interaction; and the respondents, whether trained or not, have accepted responsibility for these tasks, because they are critical to direct marketing efforts. It is not surprising that farmers are more frequently engaged in marketing their products than in carrying out market research.

Among respondents in the end customer-oriented markets, there was a high importance placed on the process of executing effective marketing strategies, even though a high number of respondents indicated that they were not fully competent in marketing. Further discussion with respondents suggested that their major marketing efforts were directed almost exclusively toward farmers markets when considering the end customer. This approach was more common among smaller operations.

Respondents in the high value production chains market appeared to have a better understanding of this series of marketing management competencies than did those in either of the two other market areas.

Comments from respondents suggested that there is an acknowledged gap in marketing expertise among producers. Producers expressed an interest in learning more about marketing management to improve their businesses.

Skills and knowledge related to an awareness of global trends was not important to smaller farm operators, while respondents from larger farms tended to rank this competency as very important. Some producers do not see their businesses being affected by global trends. For example, an organic producer who stated that his clientele was entirely local and dedicated to the farm fresh and organically produced food concept, did not consider that global trends had any impact on his market.

One representative from a high value production association indicated that their membership was generally weak with respect to market research skills, implying that there was a competency gap. This is consistent with other respondents, although there is no agreement as to the importance of this competency to business success. Many farm businesses are able to gather marketing intelligence from associations and other agencies rather than develop the competency in-house.

Customer service and customer sales/relationship skills rank high indicating that managers are aware of the importance of excellent customer service skills at the point of sale. While managers generally considered themselves to be skilled in this competency, several respondents suggested that they and their employees would be open to improvement. A few producers indicated that because they did not sell directly to the end-customer, in a retail environment, this skill was not as important to them.

When dealing with the public and direct sales, all enterprises appear to have taken great care to ensure that their best people are on the front lines of the retail exchange. However, given the acknowledged importance of this skill set, many producers would be receptive to additional training in this area.

FIGURE 22 – Marketing Management

	Number of respondents who currently have competencies	Number of respondents who currently do not have competencies
Understand basic market research	19	11
Be aware of trends in global markets	19	12
Conduct and interpret market research	16	13
Plan and execute effective marketing strategies (product positioning, branding)	24	7
Demonstrate customer service skills	24	9
Demonstrate retailing & salesmanship skills	21	10
Build and maintain relationships with customers	22	9

N=33 Totals may not equal 33 due to non-responses



Human Resource Management Skills

Many of the small operations surveyed were unfamiliar with human resource management skills to the extent that they declined answering questions from this category altogether. Few respondents had experience in this area, and none of the respondents indicated that they had any formal training. Conversely, larger businesses were keenly aware of human resource issues and the need for skills and knowledge in the subject area. There was a profound split between large and small operations in this respect.

Overall, respondents with businesses classified in the energy-oriented market considered human resource management skills to be more important than either of the other two markets. These respondents operated within a formal corporate structure and were more aware of human resource procedures and their importance.

Larger operations tended to have human resource management plans while smaller operations either were completely unaware of them or considered them to be extremely unimportant. Human resource requirements for larger enterprises appeared to be stable with low employee turnover. In cases where additional labour (usually seasonal) may have been required, a human resource plan was not something that management spent time developing.

The respondents in the energy production chains market indicated that skills in recruiting, selecting and hiring staff were extremely important and indicated that they were often actively engaged in the hiring process. There appeared to be a less formal approach toward meeting labour requirements for smaller businesses.

Understanding the procedures for hiring foreign workers was ranked as the least important topic of the Human Resource Management core competency. Only four of the businesses interviewed indicated that they routinely hired foreign workers. It is reasonable then, that businesses with no experience hiring in foreign

workers would have little understanding of the hiring process under the programs available. Given the documented industry-wide shortage of labour, increasing the understanding of processes and procedures would be helpful to closing this competency gap.

Many of the respondents from smaller operations and all of the larger firms recognized the importance of implementing workplace health and safety policies to their business success.

Respondents from larger operations generally felt that providing effective employee orientation was very important. There was a widespread lack of response to this question from among smaller businesses, perhaps as they tended to have fewer employees.

Employee retention was considered to be the least important competency in this section. Given the seasonal nature of employment among the smaller farms, it does appear that there is relatively little importance given to the issue of employee retention.

Unlike the other markets, the energy-oriented production chains were more aware and indicated their commitment to employee retention. This may be the result of the greater complexity and specialization associated with larger energy-oriented businesses or the need for higher skill levels among their employees.

Respondents generally considered skills in monitoring and evaluating employee performance as well as supervising and coaching employees to be extremely important to ensure high quality work and a productive work force.

None of the respondents indicated they had specific training in human resource management planning, and many respondents from smaller operations were unclear as to the meaning and potential application of this competency. Recruiting procedures appeared to be based on casual word-of-mouth recruiting and trial-and-error hiring practices. This was less often the case within larger operations, but the lack of human resource specific training was apparent.

FIGURE 23 – Human Resource Management Skills

	Number of respondents who currently have competencies	Number of respondents who currently do not have competencies
Develop and implement a human resource management plan	14	8
Recruit, select and hire staff	15	7
Understand procedures in hiring foreign workers	11	9
Understand compensation, benefits and employment standards	16	7
Implement workplace health and safety policies	14	10
Provide effective employee orientation	15	9
Apply an effective staff retention strategy	15	8
Monitor and evaluate employee performance	16	8
Supervise and coach employees & staff	16	7
Provide staff training	17	5

N=33 Totals may not equal 33 due to non-responses



Technical/Functional Skills

Technical and functional skills were considered to be very important across all markets. Generally, respondents felt that understanding and managing production systems as well as understanding best management practices were very important regardless of business size or market niche. The specific production skills required for each market were not formally outlined in the competency listing and, as such, were not highlighted in the interview.

Producers from the energy production chains market indicated that knowledge and understanding of technology trends and innovations was extremely important to business success.

There was a small-sub-set of respondents from the end customer oriented and high value production chain markets that were generally

opposed to technology and were committed to the continuation of production processes such as hand weeding. This response was largely restricted to smaller operations.

Respondents indicated that knowledge and understanding of legislation, regulations and policies were very important to business success. However, several respondents were careful to note that this knowledge was only important (and they were only skilled) in the specific context of their market.

The ability to seek out and obtain expert advice and assistance was considered to be very important among all producers, with no apparent difference between larger and smaller operations. This method of professional development and problem solving appeared to be favoured among many of the producers, perhaps as a consequence of the rapidly changing nature of these market areas.

FIGURE 24 – Technical/Functional Skills

	Number of respondents who currently have competencies	Number of respondents who currently do not have competencies
Understand and manage production systems	26	6
Knowledge and understanding of technology trends and innovation	27	5
Knowledge and understanding of legislation, regulations and policies	28	5
Computer and information technology skills	23	6
Implement best management practices related to commodity produced	26	6
Able to seek out and obtain expert advice and assistance as required	29	5

N=33 Totals may not equal 33 due to non-responses

In Summary, the research identified the competency areas where employers revealed their skills and knowledge were less than ideal. Competency gaps were identified when more than 25% of the respondents indicated they were not competent in a particular sub-competency. As a result, the competency gaps that will be explored further are derived from the following core competencies:

- ▷ Interpersonal Skills;
- ▷ Business Management Skills;
- ▷ Marketing Management Skills, and;
- ▷ Human Resource Skills.

Identified Competency Gaps	
Interpersonal Skills	▷ Demonstrate negotiation skills (persuasive communication)
Business Management Skills	▷ Develop and implement a succession plan
Marketing Management Skills	▷ Understand basic market research
	▷ Be aware of trends in global markets
	▷ Conduct and interpret market research
	▷ Demonstrate customer service skills
	▷ Demonstrate retailing and salesmanship skills
Human Resource Skills	▷ Build and maintain relationships with customers
	▷ Develop and implement a human resource management plan
	▷ Recruit, select and hire staff
	▷ Understand procedures in hiring foreign workers
	▷ Understand compensation, benefits and employment standards
	▷ Implement workplace health and safety policies
	▷ Provide effective employee orientation
	▷ Apply an effective staff retention strategy
	▷ Monitor and evaluate employee performance
▷ Supervise and coach employees and staff	





14 Education and Training Opportunities Gap Analysis

The education and training gap analysis was carried out by comparing the available learning opportunities with the competency gaps identified above. CAHRC's online database of learning opportunities www.agitalent.ca was used as a key comparative tool. CAHRC's Inventory Database and Gap Analysis Report published in 2009 also identified a broad spectrum of training needs associated with the agriculture sector.

Learning opportunities include formal programs, such as those offered through colleges and universities, and informal learning opportunities, such as on-the-job training, mentorship and coaching.

On-the-job training was the preferred method of upgrading skills for people who responded to this survey. However, most managers indicated that they had neither the time nor the inclination to extensively train their employees on-the-job.

Several respondents specifically discussed mentorship as a means of on-the-job training. They indicated the importance and relevance of having someone more experienced and knowledgeable with whom to communicate. Respondents also articulated the need for a mentor with whom they could ask questions and discuss problems a number of times throughout the interviews.

Formal Learning Opportunities

Many of the formal learning opportunities in agriculture focus a portion of the curriculum on management topics, including marketing, finance and human resources. Unfortunately, the programs generally attract a younger cohort, and are often not geared to mature managers. Of the programs listed on www.agitalent.ca only a few were offered in a format that might appeal to working managers. Many of the courses listed are full time programs and therefore require a full time commitment for students. Once the learner has been exposed to the workplace and has gained work experience, there seem to be fewer opportunities for upgrading skills and knowledge or for professional development through formal learning institutions in a format appropriate for a working manager.

Formal, entry-level employee training in production technologies is fairly common and generally viewed as the responsibility of the employee. Most colleges, some secondary schools and several universities provide an educational grounding in agricultural production topics. Once employees move into management roles, the gaps in skills and knowledge required for business success in the three new markets becomes evident.

Advanced Management Skills

CAHRC's earlier research into on-farm learning needs also found that 40% of farmers surveyed reported a significant need for training in agriculture management (CAHRC 2009).

In this report Agricultural management included skills and knowledge in accounting, marketing, human resources and health and safety. The reported unmet training needs by survey respondents

may reflect the preference of owner/operators for traditional non-formal methods of learning such as field days, seminars and workshops as well as informal mentoring and networking. There is a need for additional research to determine the reasons why advanced agri-business management training needs remain unfulfilled.





15 Summary and Recommendations

The forty-six sub-competencies listed and reviewed as part of the producer interviews were identified as being important to business success in all three new markets.

The data that was gathered and the skills and knowledge that were categorized into six core competencies provided the first step to identifying areas for competency development and learning program development.

While this project sought feedback from thirty-three respondents, a larger sample size would have allowed for greater confidence regarding the inferences derived. The telephone interview technique was effective in reaching respondents; however, a focus group approach may be considered for future initiatives to allow for more subjective discussion and clarification.

Asking respondents to rank the importance of particular skills and knowledge worked well; however, there is a danger that those who 'don't know what they don't know' (Howell, 1982) would not be able to effectively rank the importance of some skills. A preferred approach for follow up research would be to ask respondents to assess their competency based on a scale or a more complex questionnaire rather than answering simply yes or no.

Based on this research CAHRC has made the following recommendations:

▷ **Develop assessment tools for farmers to assess their own competencies**

The design and testing of assessment tools will provide the producer with feedback on their competency gaps, and data will be collected to learn more about the competencies of the industry as a whole to better design and deliver learning opportunities.

▷ **Develop competency profiles specific to each business within the new markets**

Competency profiles related to the skills, knowledge and abilities within each market and based on the farm business tasks will be more meaningful and applicable to farm business operators and managers. Competency profiles will assist producers with the recruitment of workers and will assist educators with curriculum development. In addition, the competency profiles will assist in raising awareness of opportunities within the sector.

▷ **Partner with training and resource providers to enhance existing programs and resources to meet the needs of the farmer.**

Enhancing learning opportunities geared to the needs of the producer will assist in mitigating the competency gaps identified by the research. The most recurring gaps were in the core competencies of business management and human resource management.



Project Reference Materials

Canada

Agriculture and Agri-Food Canada

- ▷ The Agriculture and Agri-Food System and the Canadian Economy GDP and Employment (www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1205769582306&lang=eng)
- ▷ An Overview of the Canadian Agriculture and Agri-Food System 2008
- ▷ An Overview of the Canadian Agriculture and Agri-Food System 2007
- ▷ 2008-2009 Report on Plans and Priorities
- ▷ 2007-2008 Report on Plans and Priorities
- ▷ Components of the Agriculture and Agri-Food System: Consumers (www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1205779547402&lang=eng)

Statistics Canada

- ▷ Organic: from niche to mainstream (Mar. 2008) (<http://www.statcan.gc.ca/pub/96-325-x/2007000/article/10529-eng.htm>)
- ▷ Alternative Livestock on Canadian Farms (Jan. 2008) (<http://www.statcan.gc.ca/pub/23-502-x/23-502-x2007001-eng.pdf>)
- ▷ Fork in the road: Canadian agriculture and food on the move (Jul. 2008) (<http://www.statcan.gc.ca/pub/96-325-x/2007000/article/10646-eng.pdf>)
- ▷ Population Projections –(Dec. 2005) (<http://www.statcan.gc.ca/daily-quotidien/051215/dq051215b-eng.htm>)

Canadian Federation of Agriculture – www.cfa-fca.ca

CAHRC 2005, Environmental Scan and Literature Search of Agriculture Human Resource Issues

CAHRC 2005, Human Resources Issues and Needs in the Agriculture Sector Focus Groups – Final Report

CAHRC 2009, Inventory Database for Gap Analysis Report

Energy Consumption, Environment Canada

(www.ec.gc.ca/soer-ree/English/Indicator_series/new_issues.cfm?issue_id=11&tech_id=45#bio_pic)

Farmers Markets Canada, (www.FarmersMarketsCanada.ca/PublicLibrary.cfm)

Finding Common Ground – Food for a Healthy Population and a Healthy Agri-Food Sector, Canadian Agri-Food Policy Institute (CAPI), Dec. 2007

Growing Canada's Rural Economies, Proceedings Report, Canadian Agri-Food Policy Institute (CAPI), Feb. 2008

Moving Forward on Vision and Action for Canadian Agriculture, Canadian Agri-Food Policy Institute (CAPI), Feb. 2007

Retail Sales of Certified Organic Food Products, in Canada, in 2006, Organic Agriculture Centre of Canada (OACC) (May 2007)

(http://oacc.info/Docs/RetailSalesOrganic_Canada2006.pdf)

Short Food Supply Chains, Canadian Agri-Food Policy Institute, 2008

The Potential for Grass Biofuel Pellets, The Frontier Centre for Public Policy (Feb. 2006)

Provincial

A Home-Grown Strategy for Ontario Agriculture, A new deal for farmers. A new relationship with consumers, Sep. 2007, Toronto Food Policy Council

BC Association of Farmers' Markets, (www.BCfarmersMarket.org)

BC AgriTourism, (www.AgriTourismBC.org)

Economic Impact of the Ontario Horse Industry, Aug. 2007, Ontario Ministry of Agriculture, Food and Rural Affairs

Growing a Healthy Future for B.C. Families, The British Columbia Agriculture Plan, 2007 (www.al.gov.bc.ca/Agriculture_Plan/)

Growing the Island Way, The Next Chapter for the Agriculture and Agri-Food Economy of Prince Edward Island, May 2008, Commission on the Future of Agriculture and Agri-Food on PEI (http://oacc.info/Docs/RetailSalesOrganic_Canada2006.pdf)

Locally Lambton (www.locallyLambton.com)

OMAFRA, Results based Plan Briefing Book, 2008/2009

Ontario Farmland Trust (www.OntarioFarmlandTrust.com)

Saskatchewan Research Council, Interim report by Stratego International, 2009

The future of Agriculture, Strathcona County, Jan. 2003

The Two Faces of Farming, Institute of Agri-food Policy Innovation, Guelph, Sep. 2006

What does the future hold for Quebec agriculture?, Fraser Institute, Feb. 2009

USA

2007 Census of Agriculture Data Release, USDA, 2008

Agriculture's Strategic Role in Feeding and Fueling a Growing World, Farm Foundation, Dec. 2008

Carbon Offsets - The US Voluntary Market is Growing but Quality Assurance Poses Challenges for Market Participants, US Government Accountability Office, Aug. 2008

Competing and Succeeding in the 21st Century – New Markets for American Agriculture, May 2007
21st Century Agriculture Policy Project, USA

Eat Fresh and Grow Jobs, Michigan (www.LocalDifference.org)

Ecolabel Value Assessment - Consumer and Food Business Perceptions of Local Foods, Leopold Centre, Iowa State University, 2003.

Energy Statistics, Centre for Energy (www.CentreForEnergy.com)

Food, Fuel, and Freeways: An Iowa perspective on how far food travels, fuel usage, and greenhouse gas emissions, Leopold Center for Sustainable Agriculture, Iowa State University, Jun. 2001

(www.leopold.iastate.edu/pubs/staff/ppp/food_mil.pdf)

Howell, W.S. (1982). The empathetic communicator. Wadsworth Publishing. University of Minnesota.

Local Food, Farms & Jobs: Growing the Illinois Economy, The Illinois Local and Organic Food and Farm Task Force, Mar. 2009

US and World Agricultural Outlook, Jan. 2009, Food and Agricultural Policy Research Institute (FAPRI), Iowa State University

USDA Food dollar (<http://www.ers.usda.gov/Publications/eib48/spreads/17/>)

Global

The State of Food and Agriculture, FAO, 2007

Climate Change Response Strategies for Agriculture, Challenges and Opportunities for the 21st Century, 2008, World Bank

World agriculture: towards 2015/2030 – Summary Report, FAO, 2002

World agriculture: towards 2030/2050 –Interim Report, FAO, Jun. 2006





APPENDIX A

The “four stages of competence” (Howell, 1982):

▷ Unconscious Incompetence

The individual neither understands nor knows how to do something, nor recognizes the deficit, nor has a desire to address it.

▷ Conscious Incompetence

Though the individual does not understand or know how to do something, he or she does recognize the deficit, without yet addressing it.

▷ Conscious Competence

The individual understands or knows how to do something. However, demonstrating the skill or knowledge requires a great deal of consciousness or concentration.

▷ Unconscious Competence

The individual has had so much practice with a skill that it becomes "second nature" and can be performed easily (often without concentrating too deeply). He or she may or may not be able to teach it to others, depending upon how and when it was learned."



APPENDIX B

Canadian Agricultural Human Resource Council NEW MARKETS – FUTURE SKILLS Producer Interview Form

We are:

- 1) Validating that the competencies listed are indeed the appropriate competencies
- 2) Asking if the employer if he feels that he or his employees are competent now in these competencies
 - If yes, then how did they become competent (On-the job or Formal Training?)
 - If no, then how might you or your employees become competent (On-the job or Formal?)

We are contacting you on behalf of the Canadian Agricultural Human Resource Council. We are contacting farmers and others in the agriculture sector to identify the skills, knowledge and abilities that may be required by farmers and their employees as they expand or take advantage of new market opportunities. The three market opportunities or areas that are being researched are described as follows:

- A. End Customer-Oriented Businesses – farm businesses that provide a customer ‘experience’ as an integral and essential part of the product/service i.e. that have a direct interaction with the end customer. (Examples of these businesses could be selling products at farmers markets, farm-gate sales, offering producer branded products, offering rural tourism type services, etc. A key success factor in this market is the interaction between the farm staff and the end customer.)
- B. Energy Production Chain – businesses where farms have incorporated an energy component, including production of biodiesel, ethanol, wind farms, solar farms, bio-digester or biomass operations.
- C. High Value Production Chains – businesses that operate within a tightly defined and closely delivered production chain including the production of functional foods and other high value ingredients.

For each of these market opportunities, lists of competencies (or skills and abilities) were developed that are considered to be key to the success of any enterprise in these markets.

As part of the project we are asking producers like yourself to share your views on these ‘competencies’ in order that we may more accurately predict future human resource needs of Canadian agriculture and plan effective and efficient training responses.

We would appreciate your thoughts on this project.

Part A: General questions about you and your enterprise:

1. Please describe what products or services you provide

2. How long have you been in this business? _____ years

3. How many people are employed as part of this enterprise? (described in #2)

1-5 people _____

5-10 people _____

More Than 10 people _____

How many of those people are employed full-time, year-round? _____

Part B: Competency Questions

Please score as follows based on your opinion as to the extent each competency is key to your success in this enterprise. Please consider your own competencies, as well as the skills and abilities of your employees or workers.

1. On a scale of 1 to 5, where 1 is extremely unimportant and 5 is extremely important (or necessary), please rate each competency in terms of relative importance to success.

1 – Extremely unimportant (necessary?)

2 – Very unimportant

3 – Neither important nor unimportant (neutral)

4 – Very important

5 – Extremely important

Interview Questions on the competencies listed in table B1:

<p>How important is this skill or ability to my business success? Score 1-5</p>	<p>Do I or my employees have these skills now? YES or NO</p>	<p>If yes, how did I attain these skills- formally through school or informally through on the job training?</p>	<p>If no, how might I get these skills – formal or informal training?</p>
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COMPETENCY	
Interpersonal skills	
1.	Communicate clearly and concisely (listening, speaking, writing)
2.	Act as a positive team member (ability to build consensus, ability to generate cooperation)
3.	Demonstrate conflict resolution skills
4.	Demonstrate critical thinking skills
5.	Demonstrate negotiation skills (persuasive communication)
6.	Motivate employees and colleagues (ability to motivate others)
7.	Understand and recognize different points of view, lifestyles and culture
8.	Exhibit problem solving skills (ability to tackle complex challenges)
Leadership	
9.	Create and communicate a vision
10.	Develop strategic plans, set goals and priorities
11.	Build effective teams
12.	Delegate to others
13.	Provide opportunities for others to take leadership. Empower others to deliver results.
14.	Mentor and coach employees
15.	Apply situational leadership
Business Management	
16.	Demonstrate an entrepreneurial approach
17.	Develop and implement a business strategy
18.	Assess and manage the economics of production
19.	Implement and manage a financial management plan
20.	Build partnerships with suppliers, customers and other producers
21.	Develop and implement risk management plans
22.	Be knowledgeable of current technology and trends
23.	Develop and implement a succession plan
Marketing Management	
24.	Understand basic market research
25.	Be aware of trends in global markets
26.	Conduct and interpret market research
27.	Plan and execute effective marketing strategies (product positioning, branding)
28.	Demonstrate customer service skills
29.	Demonstrate retailing & salesmanship skills
30.	Build and maintain relationships with customers



COMPETENCY	
Human Resource Skills	
31.	Develop and implement a human resource management plan
32.	Recruit, select and hire staff
33.	Understand procedures in hiring foreign workers
34.	Understand compensation, benefits and employment standards
35.	Implement workplace health and safety policies
36.	Provide effective employee orientation
37.	Apply an effective staff retention strategy
38.	Monitor and evaluate employee performance
39.	Supervise and coach employees & staff
40.	Provide staff training
Technical/Functional skills	
41.	Understand and manage production systems
42.	Knowledge and understanding of technology trends and innovation
43.	Knowledge and understanding of legislation, regulations and policies
44.	Computer and information technology skills
45.	Implement best management practices related to commodity produced
46.	Able to seek out and obtain expert advice and assistance as required

Are there additional skills/abilities or competencies that you require for your business that have not been mentioned?

We thank you for taking the time to complete this survey and for sharing your thoughts and opinions. The Canadian agricultural industry has a bright future and we thank you for your participation in this project.



APPENDIX C

Respondents' Information				
Type of Market	Province	Product	Part Time/ Seasonal Employees	Full Time Year Round Employees
End Customer Oriented Business	AB	Plants for Sale	58	150
End Customer Oriented Business	SK	All Natural Meat	12	30
End Customer Oriented Business	BC	Fruit/Vegetables/Crafts	10	85
End Customer Oriented Business	NS	producer/Packer/Marketer	38	200
End Customer Oriented Business	ON	Organic Vegetables/Meat	18	3
End Customer Oriented Business	ON	Vegetables/Meat	17	3
End Customer Oriented Business	QC	Organic Vegetables	29	1
End Customer Oriented Business	ON	Meat/Vegetables/Seed/Other	30	1
End Customer Oriented Business	NB	Organic Vegetables	17	3
End Customer Oriented Business	NS	Vegetables	4	1
End Customer Oriented Business	NB	Organic Vegetables/Fruit	5	5
End Customer Oriented Business	NB	Meat	4	3
Energy Oriented Production Chains	ON	Geothermal Energy	30	30

Respondents' Information (continued)

Type of Market	Province	Product	Part Time/ Seasonal Employees	Full Time Year Round Employees
Energy Oriented Production Chains	ON	Scientific Programs & Research	10	120
Energy Oriented Production Chains	AB	Wind Generation	8	7
Energy Oriented Production Chains	AB	Private Turbine Owner/Operator & Farmer	7	4
Energy Oriented Production Chains	AB	Wind Generator	2	1
Energy Oriented Production Chains	QC	Corn to Ethanol	5	1
Energy Oriented Production Chains	SK	Ethanol Production & Cattle Feedlot	13	13
Energy Oriented Production Chains	ON	Green Energy Alliance	10	8
Energy Oriented Production Chains	AB	Biogas/Ethanol	10	10
High Value Production Chains	NB	Organic Meat	2	2
High Value Production Chains	NS	Fruit and Broker	0	2
High Value Production Chains	QC	Organic Cheese	4	2
High Value Production Chains	ON	Herbs & Vegetables	0	2
High Value Production Chains	QC	Organic Dairy	3	1
High Value Production Chains	MB	Organic Grain	2	2
High Value Production Chains	SK	Herbs/Spices/Natural Products	3	2
High Value Production Chains	MB	Specialty Flax Seed	55	50
High Value Production Chains	QC	Vegetables	3	2

Respondents' Information (continued)				
Type of Market	Province	Product	Part Time/ Seasonal Employees	Full Time Year Round Employees
High Value Production Chains	BC	Berries	110	5
	ON	Organic Produce	100	30
	ON	Organic Apples/Cider Apple roducts	10	6

Respondents' Information				
Groups Categorized by Markets	Markets	# Years in Business (Avg)	# Employed Seasonal/ Part Time (Avg)	# Employed Full Time (Avg)
Group A	End Customer- Oriented Business	20.2	40.4	13.1
Group B	Energy-Oriented Production Chains	18.4	10.6	21.6
Group C	High Value Production Chains	25.8	24.3	8.8
AVERAGE OF GROUPS		21.5	25.1	14.5





APPENDIX D

Importance Rankings: Interview Questions Summary by Market Type											
Markets by Group	Core Competency	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Group A	Interpersonal Skills	4.6	4.4	4.4	4.3	3.1	4.0	3.9	4.6		
Group B		4.6	4.6	4.6	4.4	4.4	4.4	4.1	4.7		
Group C		4.5	4.5	4.2	4.3	4.2	4.2	4.5	4.5		
AVERAGE		4.6	4.5	4.3	4.3	3.9	4.2	4.2	4.6		
		Q9	Q10	Q11	Q12	Q13	Q14	Q15			
Group A	Leadership	4.5	4.5	3.9	3.8	4.5	4.2	3.6			
Group B		4.6	4.8	4.2	4.1	4.0	4.1	4.3			
Group C		4.7	4.4	4.3	4.2	4.2	4.3	4.4			
AVERAGE		4.6	4.6	4.1	4.0	4.2	4.2	4.1			
		Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23		
Group A	Business Management	4.0	4.4	4.5	4.4	4.3	3.6	3.8	4.4		
Group B		4.4	4.2	4.1	4.7	4.6	4.1	4.4	4.3		
Group C		4.5	4.3	4.6	4.5	4.6	3.7	3.9	3.4		
AVERAGE		4.3	4.3	4.4	4.5	4.5	3.8	4.0	4.0		
		Q24	Q25	Q26	Q27	Q28	Q29	Q30			
Group A	Marketing Management	3.8	3.4	3.4	4.5	4.8	4.8	4.8			
Group B		3.9	3.7	4.1	4.3	4.6	4.1	4.7			
Group C		4.1	4.1	3.3	4.4	4.3	3.8	4.3			
AVERAGE		3.9	3.7	3.6	4.4	4.6	4.2	4.6			
		Q31	Q32	Q33	Q34	Q35	Q36	Q37	Q38	Q39	Q40
Group A	Human Resource Skills	2.5	3.4	2.3	3.4	3.8	3.6	3.3	3.8	3.8	3.8
Group B		3.8	4.0	1.6	3.6	4.0	3.8	3.9	3.8	3.8	3.7
Group C		3.0	3.2	2.5	3.2	3.6	3.2	2.7	2.7	2.9	2.6
AVERAGE		3.1	3.5	2.1	3.4	3.8	3.5	3.3	3.4	3.5	3.4
		Q41	Q42	Q43	Q44	Q45	Q46				
Group A	Technical/Functional Skills	4.6	3.4	4.3	3.5	4.0	4.2				
Group B		4.3	4.4	4.1	4.3	3.8	4.6				
Group C		4.3	3.9	3.9	3.3	4.1	4.5				
AVERAGE		4.4	3.9	4.1	3.7	4.0	4.4				

