Food Secure Vancouver
Baseline Report

Prepared For

Vancouver Food Policy Council

Vancouver, BC

Prepared By

Serecon Management Consulting Inc.,

In Partnership With

Zbeetnoff Agro-Environmental Consulting Inc.

March, 2009

March 26, 2009

Dr. Carole Christopher
Vancouver Food Policy Council Co-Chair
Vancouver, BC

Dear Dr. Christopher:

RE: FOOD SECURE VANCOUVER – BASELINE REPORT

Serecon Management Consulting Inc.(Serecon) and Zbeetnoff Agro-Environmental Consulting Inc. (Zbeetnoff), are pleased to provide this Food Secure Vancouver – Baseline Report. We have taken into account the comments of the Steering Committee which were made over the past several months.

Yours truly,

SERECON MANAGEMENT CONSULTING INC.

Dr. Ralph Ashmead
Calgary Office

ZBEETNOFF AGRO-ENVIRONMENTAL CONSULTING INC.

Mr. Darrell Zbeetnoff
White Rock

Enclosure

/da

#600, 10665 – Jasper Avenue
Edmonton, Alberta, Canada T5J 3S9
Telephone: (780) 448-7440
Facsimile: (780) 421-1270
www.serecon.ca

#201, 1055 – 20 Avenue, NW
Calgary, Alberta, Canada T2M 1E7
Telephone: (403) 216-2100
Facsimile: (403) 216-2111
www.serecon.ca

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This study was guided by the following Steering Committee members:

Herb Barbolet, Vancouver Food Policy Council

Dr. Carole Christopher, Co-Chair, Vancouver Food Policy Council

Barbara Joughin, Vancouver Food Policy Council

Brent Mansfield, Member of the Vancouver Food Security Committee

Kim Sutherland, MSc., P.Ag. Vancouver Food Policy Council

vancouver
FOOD POLICY COUNCIL

March 9, 2009

Re: Baseline for Food Secure Vancouver Report

In 2008, the Vancouver Food Policy Council (VFPC) embarked upon a two-year Food Secure Vancouver Study to identify, review and analyze key factors that are required to support and enhance Vancouver's food security. Our committee was struck to identify the key determinants of food security, denote benchmarks, and recommend strategic priorities and policies to be considered by the City of Vancouver to assist with achieving food security. We decided to do this work in two phases.

Phase 1, completed in March 2009, defined what is meant by a food secure Vancouver and identified a benchmark measurement methodology. To do this, we worked with a team of student researchers, and hosted a community dialogue. We also commissioned a consulting team composed of an agricultural economist and a specialist in creating benchmarks to produce a Baseline for Food Secure Vancouver Report. We asked for an overview of current and projected food production, food demand, and the food distribution system supplying the City of Vancouver and its surrounding region. This report documents their findings and provides background information for further work.

In Phase 2, we will circulate the Baseline for Food Secure Vancouver Report for comments and constructive criticism. We are also seeking information to fill gaps in the report. Then, we will use the information and tools we have gathered to assess the state of Vancouver's food security, consult and communicate with the community and policy-makers, and identify priority actions for food security and food system initiatives.

The Baseline for Food Secure Vancouver Report:

- Proposes a working definition and some key determinants of food security in Vancouver;
- Offers a methodology and draft indicators for measuring our food security;
- Strives to describe the present day reality of the region's food production, distribution, and waste system (of particular interest is the Agricultural Land Reserve's role in helping Vancouver to be food secure);
- Examines food in a regional context, identifying regionally-grown food and land requirements for a local agricultural production system, and ties our food security, in part, to the necessary productive agriculture lands within our region;
- Identifies several areas that require analysis or further study in order to develop a more complete understanding of determinants and indicators of our food security.

The Baseline for Food Secure Vancouver Report does not fully assess the emerging local food system, which must be done, and provides only a passing glance at charitable food and its 'role' in food security.

The prime questions now for the VFPC are: How sustainable is the global food system in the face of global stresses caused by, among other factors, increasing population, climate change, higher energy costs, health concerns, and changing consumer preferences? What role does the local food system play in this? And, what are the implications for food security in Vancouver?

This report and other work and collaboration by the Food Secure Vancouver Study committee are initial steps towards answering these and other essential questions. Your comments are welcome.

The Food Secure Vancouver Study Committee

Herb Barbolet *Dr. Carole Christopher* *Barbara Joughin*
Brent Mansfield *Kim Sutherland, MSc., P.Ag.*

Though the VFPC believes reasonable efforts have been made to ensure the accuracy of the information contained in the Baseline for Food Secure Vancouver Report, it may include inaccuracies or typographical errors. It is intended for discussion and educational purposes only, and is provided 'as is'. The conclusions expressed in the report may not represent the values or position of the VFPC.

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GLOSSARY OF TERMS

Domestic Consumption – generally defined in kilograms per person (per capita) represents the amount of net consumption after reflecting the losses that occur at the production, processing, retail levels in the food chain, and that amount that is lost or thrown out in the home, and restaurants.

Domestic Disappearance – a term used to describe the amount of a commodity that is available for all uses and is a calculated residual obtained by adding beginning stocks, imports and production (total supply) and subtracting imports and ending stocks. Total supply minus exports and ending stocks gives a residual amount – domestic disappearance. Domestic disappearance does not represent the total amount of a commodity actually consumed by individuals since it does not account for losses incurred at the retail level, nor does it include household, cooking and plate loss. Source: http://www.statcan.gc.ca/pub/23-014-x/2008003/6300052-eng.htm

Lower Mainland – a geographical description used in the Statistics Canada Agriculture Census and other agencies to describe that portion of Southwest BC containing the following Regional Districts: Greater Vancouver, Fraser Valley, Sunshine Coast, and Squamish –Lillooet.

Metro Vancouver – consists of a federation of 22 member municipalities and one electoral area, including Village of Anmore,Village of Belcarra, Bowen Island Municipality, City of Burnaby, City of Coquitlam, Corporation of Delta, City of Langley, Township of Langley, Village of Lions Bay, District of Maple Ridge, City of New Westminster, City of North Vancouver, District of North Vancouver, City of Pitt Meadows, City of Port Coquitlam, City of Port Moody, City of Richmond, City of Surrey, City of Vancouver, District of West Vancouver, City of White Rock, an Electoral Area A. Metro Vancouver was formerly known as the greater Vancouver Regional District (GVRD) prior to 2008.

Food Security: is typically defined as ***"Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy lifestyle."*** In this study, the more relevant and practical definition is "***Food security is achieved when the structure and capacity of the food system is resilient and adaptive and can meet the food related human, cultural, economic, social and environmental needs of the individual and community."***

EXECUTIVE SUMMARY

INTRODUCTION

This is a baseline report on the food system in Vancouver and region. The analysis relies on existing data, geographical aggregations, and other information that the industry currently generates. The report's focus is on describing the system as it is now with respect to production and supply, distribution and consumption. The existing databases are not necessarily conducive to providing insight into all aspects of food security in Vancouver's food supply and distribution and several gaps in the assessment are evident.

This study begins to define food security, the determinants of food security, and the identification of food security indicators. These are critical first steps in developing benchmarks to identify information gaps, articulate meaningful indicators, and to develop measures of changes in food security.

The current food system in BC and Canada is profit driven and, for the most part, based on a globally competitive model of efficiency and low costs. The system is not necessarily driven by the needs of the local community nor does it directly address issues of food security. Food access by all members of the community is largely presumed. Segments of society that are visibly unable to afford their food needs are supplied through food charities. In addition, the food system is also wasteful, with almost half of the food being lost or destroyed between initial production and final consumption.

This report also provides needed context to Vancouver's food supply and food distribution debate. Clearly, the lower mainland must be considered "part and parcel" of the relevant food supply system as Vancouver itself will never be likely to achieve food self-sufficiency itself. While interest in personal and community growing of food in Vancouver is desirable, these efforts should be understood in relation to where local food currently comes from and how urban supply and regional food supply contribute to food security. In this regard, maintaining and enhancing the capacity of the regional food supply system is clearly implicated in Vancouver's ability to pursue food security effectively.

The food distribution system is also changing as its capacity to respond to the diverse economic, social, cultural and environmental needs of the community is being questioned. Consumers and the larger community are becoming concerned about where their food is produced, the environmental costs of food production and transportation, and the long term sustainability of the food supply system, particularly as it relates to the main factors of production – land, water and agriculture producers.

In this respect, conventional food system analysis is less than illuminating when social and cultural factors are included in performance measures. As expected, the study has encountered difficulty in using existing information

to shed light on the social and cultural measures and indicators of food security. Alternative community-focused food distribution models and systems are rapidly appearing and evolving. Moreover, it is unclear whether there is any consensus on the types of changes that constitute improvements in this field.

DEFINING FOOD SECURITY

More basic than the concept of food security is the question: What is food? There are several functions of food that transcend nutritional attributes into the social, religious and political dimensions of human societies. Evidence of the cultural relativity of food is manifested in the roles that food and fasting play in various cultural practices and religious customs. The nutritious content of food is but one aspect of human sustenance. Indeed, it has been argued that the processed products that humans are consuming today are "edible food-like substances" and no longer products of nature but of food science.[1]

Ultimately, food security should be defined and measured to reflect these broader food roles. However, little work has been done to identify indicators for these broader indicators of food security and certainly the information required to create those indicators is not readily generated by today's food systems. As such, the present report should be viewed as a synopsis of the Vancouver region's capacity to supply food products to its resident population.

Food security is traditionally defined as "***Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy lifestyle."***

In the course of this study, a more practical and operational definition is proposed:

> ***Food security is achieved when the structure and capacity of the food system is resilient and adaptive and can meet the food related human, cultural, economic, social and environmental needs of the individual and community.***

The **food system**, the nucleus of this definition, is defined as the integrated process by which food is produced locally, imported, is packaged, processed, distributed/marketed, consumed, and the waste stream managed through reuse, composting and disposal.

First, this definition has the following implications:

- The current food system is not fully adequate to meet the current and long term needs of the community and society, and that it needs to be adapted and improved.
- The food system needs to be responsive to a broad range of human, cultural, social and environmental needs and concerns of

[1] See Pollan, M. 2008. In Defense of Food. Penguin Press. Reprint.

community, rather than only responding to the economic and commercial drivers of the food suppliers.

- The food system will also have to be dynamic to adapt in the future to specific changes in demand caused by increased awareness of health and to stressors such as food production shortages caused by climate change, increasing population, and higher energy costs.

Second, the definition is outcome based. That is, efforts to improve food security necessarily will impact and have consequences on the human, economic, social and environmental health of individuals, the community and the configuration of the food system

DETERMINANTS OF FOOD SECURITY

There are a broad number of trends, forces and issues that may impact or correlate with changes in the food security status of a community or city. A variety of these have been identified in this study, and categorized within the four sustainability dimensions of human, environmental, social, and economic health.

More fundamentally and practically, food security is considered related to three primary determinates:

1. **Affordability:** The ability of individuals to afford food is directly related to both the level of income, and the price of food. Affordability speaks directly to the accessibility component of food security. The food may be available, acceptable, and adequate, but the individual must be able to have the financial resources to access it.
2. **Knowledge:** Understanding the relationship between nutrition and health is a critical component affecting the food security status of individuals. A major concern particularly with respect to young people has been the consumption of fast foods with low nutritional value, leading to a range of diseases such as diabetes, and leading to other later life chronic diseases. Being able to afford adequate quantities of food does not lead to a food secure system if poor choices are being made on food nutrition or if the food system is systematically providing incomplete information to make good food choices.
3. **The Food System**: The other main issue that directly affects the food security status of cities and individuals is the food system that produces, manufactures, distributes and markets food. If the system is not able to make food available, accessible, acceptable and adequate, the status of food security will be compromised. Critical elements of the food system are the land and sea-based resources and food producers that are the underpinnings of the local (or any) food supply. Further, this food system will be required to adapt to dynamic forces, such as climate change, fluctuating productivity of the resource base, and the availability/affordability of agricultural inputs, that will affect its ability to continue to produce food over time.

These three fundamental determinates provide the basics through which the food security of an individual, community or region can be measured, and they provide the focus through which actions can be taken to bring about improvements in the community's food security status.

Food Security Outcomes

A critical element of the approach in this report is an emphasis on outcomes – what are the critical impacts and outcomes that the city and community wish to achieve from the food system.

The way in which the food system makes food available, accessible, acceptable and adequate, and affects the human, environmental, economic health, the social equality of individuals and communities. There are functional relationships between the regions' food system and each of these factors, as illustrated in Figure 1 below.

Summary Figure 1: The Desired Outcomes of Food Security

Enhanced Food Security Model

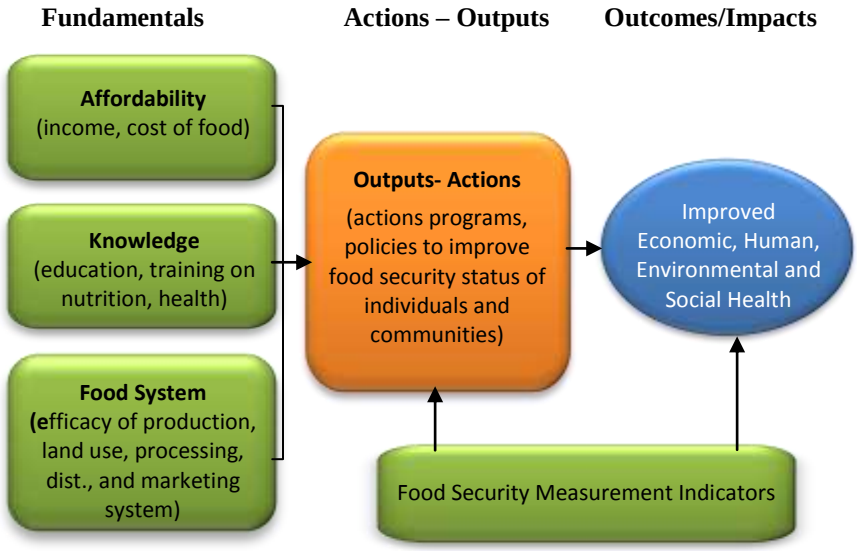
A logic model has been developed that provides the framework by which these fundamentals can be linked to a set of actions, which would lead to desired changes to the food security status of a community. The fundamentals affecting food security status provide the logic or rationale for the selection of different actions that could impact on the food security status of a community. The various actions with the potential to contribute to the four desired outcomes of a food secure community, (i.e., meeting the community's human, cultural, environmental, social and economic food needs) include:

- improving the accessibility/affordability of food
- providing better knowledge about food nutrition and health
- modifying the food distribution system to provide greater access
- preserving the local agricultural land base,
- maintaining and enhancing agricultural resources productivity
- beneficially managing food waste.
- supporting the economic viability of the food system.

Central to this model (Figure 2), is the identification and use of food security measurement indicators that would assist in monitoring the achievement of outcomes. These indicators would be benchmarked to the current food security situation within the different communities in Vancouver.

The preservation and enhancement of the capacity for local food supply deserves restatement as a fundamental and necessary condition for improved food security. In particular, a local agricultural land base should be anticipated to be more responsive to a local community's food needs, as local producers are best situated to supply local markets. Local food supply also is expected to provide a degree of food self-reliance that can act as a buffer against food system disruptions and fluctuations as well as providing local control over food quality. Measures of the ability to provide local food supply are highly relevant indicators of food security.

Summary Figure 2: Enhanced Food Security Logic Model



Food Supply Capacity In BC And Vancouver

Food supply is impacted by agriculture production in a region and by the balance of exports and imports. For Vancouver[2] and BC, there is significant local production of vegetables, fruit, milk, eggs, poultry, fish and beef. In terms of self-reliance, BC produces essentially all its own supply for milk, eggs and poultry.

[2] Several geographical terms are used in this study. Where Vancouver is used, this refers to the geographical limit of Vancouver as a Census unit in Metro, including West Vancouver and North Vancouver. Metro Vancouver is the new name of the Greater Vancouver Regional District (GVRD) and includes Langley, Surrey, Delta, Richmond, Greater Vancouver A, Vancouver, Burnaby, Pitt Meadows and Maple Ridge. The Lower Mainland definition includes the GVRD, the Fraser Valley Regional District, the Sunshine Coast Regional District, and the Squamish – Lillooet Regional District (i.e., the South Coast).

BC produces nearly enough fish and vegetables to meet its supply needs. Because of seasonality in production and production that is specialized in a limited number of products, a significant proportion of BC food production is exported, with resupply by imports to meet total demand.

Far less local production actually enters the local market as a result. About 20% of the total vegetable supply for BC and the Vancouver region is derived from local sources, while this figure is closer to 40% for fish.[3]

While BC produces adequate levels of fruit and meat products, the local production is bolstered by imports. The self-reliance in these commodities is generally between 10 and 50%. BC is not at all self-reliant in the production of coarse grains, where it is estimated that less than 2% of the supply comes from local sources.

While the concepts of food security and food self-reliance overlap, the interplay between the two concepts is important to an understanding of how food self-reliance influences food security. As indicated in the above section, food security is a robust concept that includes several parameters in addition to the physical production of food. Self-reliance is the ability to meet consumption with what is supplied by domestic production.

Overall, BC farmers produce 48% of all foods consumed in BC and 56% of the foods consumed that can be economically grown in BC[4]. This measure varies substantially by food group. With BC population growth projected to increase 30% by 2025, it may be anticipated that food production will have to grow by at least 30% to maintain the same self-reliance rate.

Because of the climatic zone in which BC is situated, the size and composition of its population, and the limited capacity of some components of the agricultural system, it is not possible to produce all the required nourishment, nor is it possible to supply stable levels of nutrition year-round. Trade is critical in ensuring that BC products are used beneficially when they are available in adequate quantities seasonally, and so that consumers are able to access the full range of their food needs when BC products are not available.

Trading patterns and relative pricing determine which food products are grown in BC. Economic feasibility plays an essential role in the mix of food products and the distribution systems in which they are marketed. If products may be obtained more cheaply through trade, they are unlikely to be grown in BC. BC food producers will target those markets in which they have a relative market advantage and that yield the most favourable returns.

[3] BC Ministry of Agriculture and Lands. 2006. BC's Food Self-Reliance: Can BC's farmers feed our growing population? http://www.agf.gov.bc.ca/resmgmt/Food_Self_Reliance/BCFoodSelfReliance_Report.pdf, and Statistics Canada, Agricultural Census, 2006.

[4] See BC Ministry of Agriculture and Lands. 2006. BC's Food Self-Reliance: Can BC's farmers feed our growing population?

BC cannot expect to be totally self-reliant for its food production. However, based on the food security definition used in this study, one can strive to increase food security at the existing level of self reliance. The question of whether greater food self-reliance is desirable from a food security risk perspective is complicated. Trade reduces exposure to the food supply risk of domestic crop failure, while having food supply close to home reduces the risk of food shortage due to a foreign catastrophe. It would appear that a balanced approach best allows for the mitigation of food supply risk.

Other issues around production and supply evaluated include the distribution of land by use and the prevalence of sustainable practices. Use of sustainable practices in the local production of food is likely to decrease the risk of production supply shortfalls due to changes in input costs or import shortfalls, thus, tracking their adoption is a potentially useful indicator of food security.

Overall, about 80% of the land in the Agriculture Land Reserve in the Lower Mainland is in production. There is some room for expansion onto land that is currently unused or in hobby farms, although the amount of land available for expansion is approximately is likely less than 6% of total land area, or 6,000 to 7,000 hectares. In addition, there is some potential to increase food production on the existing land base through improved drainage, improved irrigation, more intensive production practices, and bringing more area into irrigated production.

Of the current productive land base, the vast majority is directed to food production. Approximately 94% of productive land is used to produce food, although the majority of it (76%) is used for livestock products.

Food security is also improved by a well integrated and robust agriculture production system and sustainable production practices which ensure that the land and water and air quality are not deleteriously impacted by agriculture practices. One proxy for sustainable practices is the rate of adoption of beneficial management practices, often are hard to track, except where these practices have been adopted as part of the Environmental Farm Program. Integrated pest management systems are another proxy for sustainable management. Organic production is a measure of a production system that restricts pesticide use and employs more sustainable production practices. There can be economic barriers to the adoption of organic production practices, including those that may not be encountered in conventional production practices.

This analysis shows that farms are adopting Environmental Farm Plans. About 15% of fruits and vegetables, and about 1% of meat and livestock products are organic. It is unknown how many farms have adopted beneficial management practices on their own and how many farms use integrated pest management practices. There would appear to be room to improve both the tracking the adoption of beneficial management practices and the uptake of sustainable food production practices.

There is also evidence of increased urban agriculture and suburban garden production in BC. These alternative food production systems are oriented primarily to horticultural production (as opposed to livestock production)[5]. While the initiatives are complementary to the goal of more local production, their contribution is likely to be marginal to improved overall regional food security. Tracking these developments can provide indicators of the extent to which residents are repatriating their roles as producers of food.

The Food Distribution System In The Vancouver Region

The food distribution system links food producers and processors to consumers. The food distribution network in BC is overwhelmingly a profit-motivated supply chain that links producers, fishers, and processors with consumers.

In 2005, the retail sector accounted for about 60% of total commercial food sales in BC ($10.2 billion). The dominant supply route of food to food retailers is through wholesalers, who often are processors. The remaining 40% of commercial food sales in BC ($6.8 billion) is accounted for by the foodservices sector and is found in sales to hotels, restaurants and institutions (HRI).

Local BC food production has a varied role in providing food to Lower Mainland consumers. In supply managed sectors, such as dairy, poultry and eggs, local production accounts for the bulk of consumption. With limited exceptions in an era of large and multinational grocery retailers, food service distributors and correspondingly large suppliers, the aggregate scale of local production is not sufficient to command market share, except for short periods seasonally. As such, the Lower Mainland food supply consists of short seasonal abundance, significant off-season imported product flows, and exports in periods of seasonal excess.

The ability to provide volume, consistent quality and year-round supply is critical in mainstream food markets. Local production has tended to hold market share in niche areas that large suppliers are too large to supply. Concerns about community food security, carbon footprint, energy costs, environmental impacts, and climate change have the potential to change distribution networks in the future. Local production has advantages in supplying local markets and meeting food security objectives that imports cannot.

Distribution systems that access local food are growing for other reasons as well. Local food niche production and marketing provides organic products, responds to ethnic demand, provided greater confidence about grower production practices, and minimizes the petroleum required to

[5] Note however, that Vancouver is considering an urban chicken policy, http://www.suzanneanton.ca/cms/the-news/suzanne-in-the-media/playing-chicken/ , and has developed a guideline for urban bee keeping in residential areas. http://vancouver.ca/commsvcs/socialplanning/initiatives/foodpolicy/projects/beekeeping.htm

transport products to market. The system is in transition and many of the local functions related to production, processing, and distribution that have been dismantled or stressed in the past and need to be re-constructed.

The food distribution network in Vancouver is continuously evolving and is being augmented through alternative food distribution networks. The existing food distribution system is perceived to have inadequacies respecting its ability to deliver food security, as evidenced by the large and growing need for food charities. The alternative systems, thought in their infancy, include producer direct-to-consumer marketing and delivery, bulk food buying cooperatives, community shared agricultural initiatives, urban gardens, community gardens, and direct-to-consumer food service. The contributions of these alternative food systems are likely to be comparatively insignificant into the near-term future. It is anticipated that the mainstream food distribution system has to be co-opted under the rubric of community food security. The major challenges include improving public accessibility to products that have the wholesome attributes required of nutritious and healthy food and developing distribution systems more responsive to the food challenges of local residents.

Food Demand In BC And Vancouver

The food supply and demand balance in Vancouver is best understood in its regional context because of the inverse relationship of farm land base with population. In 2007, Vancouver's population was 612,000[6], or about 27% of the population of Metro Vancouver. In contrast, Vancouver's Census farm area was just 1,397 ha[7], or 3.4% of the Metro Vancouver farming area. As such, Vancouver is currently capable of generating very little of its primary food requirements.

Based on per capita current food consumption patterns and population growth trends, the quantity of food that is now and will be demanded per year by 2020 has been estimated for Metro Vancouver. While food security policy may be largely determined by Metro Vancouver's population, the security of the farm land base will be dependent on land use decisions made for the entire Lower Mainland, and particularly the Fraser Valley Regional District.

The current level of food disappearance (2005) for the Metro Vancouver was 1,645,430 tonnes. The demand on an annual basis is expected to be 445,820 tonnes greater by the year 2020, accounting for both population changes and changes in consumption patterns. The distribution of the demand by product type indicates the greatest demand for vegetables, followed by fruits and cereal products.

Metro Vancouver represents about 87% of the Lower Mainland population but contains only 38% of the farmed area. A critical statistic for Metro Vancouver is that it currently can produce about 27% of its food needs.

[6] See http://www.bcstats.gov.bc.ca/data/pop/pop/mun/Mun2007txt.pdf
[7] Vancouver is lumped in with Burnaby in the Census data, for confidentiality reasons. About 25% of the area indicated may actually be located in Vancouver.

In the Lower Mainland, the capacity for food production increases substantially, but as shown in Figure 3, still does not meet current regional demand. Vancouver's population, at 24% of the Lower Mainland population, dominates[8] the regional demographics and contains only 1.3% of the farm land base.

One critical issue is the amount of food wastage that occurs within the food production, processing, distribution, retailing and consumption chain. While the proportions vary by food type, on average, almost one-half of the food that is produced (known as food disappearance) is lost or destroyed before consumption. In reality, of the 1,645,430 tonnes of food disappearance in Metro Vancouver, some 48% or 789,800 tonnes is not consumed by the final consumer. In this respect, the food production and consumption system is very inefficient.

Summary Figure 3: Food Demand, Local Supply and Gap, Lower Mainland and Metro Vancouver, 2006 (MT)

Another critical measure of food security is the amount of food that is or could be produced locally. The local supply, food demand, and supply gaps for the Lower Mainland and for Metro Vancouver, both in 2006, and the expected situation in 2020, are indicated in Figure 3.

Currently, the food gap in the Lower Mainland (which includes the Regional Districts of Fraser Valley, Sunshine Coast and Squamish-Lillooet) is about 834,000 tonnes of food annually. The gap is defined as the difference between local food production capability and total food consumption needs. For Metro Vancouver, which excludes the Fraser Valley, the food gap is much larger, at about 1.3 million tonnes annually.

[8] However, Surrey also represents 16% of the Lower Mainland population.

FOOD SECURITY INDICATORS

Central to the development of a food secure system for Vancouver is the ability to identify indicators. Measurable food security indicators have three purposes:

- To establish where the city and region currently is with respect to its level of food security
- To be able to use these indicators to establish progress toward the achievement of the desired outcomes for a food security system in the region or city, and
- To benchmark the food security position of the region relative to other jurisdictions.

A range of possible food security indicators are presented in Summary Table 1. The list is not complete and needs to be further evaluated in terms of the local Vancouver environment.

Summary Table 1: Suggested Food Security Indicators

Food Security Outcome	Food Security Indicators	
	Direct	Indirect
Economic Health	➡ Number of days local food supply ➡ Proportion of food produced locally ➡ Farmers/processors net income ➡ Changes in amount of agricultural productive land ➡ Amount of food wasted (gap between food disappearance (primary production) and consumption ➡ Level of social assistance paid	➡ Level and distribution of household income as measured by Gini Index ➡ Rate of unemployment ➡ Level and rate of population growth ➡ Relative average price of food staples
Environmental Health	➡ Index of use of chemical fertilizers, pesticides, insecticides ➡ Proportion of organic food production ➡ Carbon footprint and energy use in production, processing, distribution of food ➡ Average distance food produced from consumption ➡ Level of water pollution, run-off, soil degradation	➡ Impact of climate change on production capacity ➡ Level of water consumption ➡ Proportion of farmers implementing Environmental Farm Plans ➡ Level of adoption of organic production methods, conservation, and IPM practices
Human Health	➡ % population obese ➡ % people malnourished ➡ Proportion plant to animal food consumption of protein, fats and carbohydrates	➡ Incidence of chronic disease ➡ Quality of diets – level of fruit, vegetable, cereal consumption
Social Health and Equality	➡ Proportion of food produced in urban agriculture ➡ Number of people served by charities/food banks ➡ Distribution of retail food outlets ➡ Number of social assistance agencies	➡ Number and trend in number of agricultural producers ➡ Number of market gardens, community gardens

Developing Actions To Improve Food Security

A range of possible actions that could be undertaken are suggested and some actions have already started (see Summary Table 2). These are categorized in relation to the three determinants of food security (affordability, knowledge, and the food system).

This list is provided only as a platform for discussion. Each community would have more and specific actions relevant to their unique situations.

Summary Table 2: Suggested Food Security Actions

Food System Changes	*Farmers Markets*
	Proactive Agricultural Land Use Preservation Policies
	Organic/alternative Production Systems
	Self/Local Sufficiency
	Local Distribution Systems
	Local Processing Enterprises
	Traceability Systems
	Cooperative Local Stores
	Urban Agriculture
Enhanced Knowledge	*Nutrition Education*
	Urban Farm Schools
	Awareness of Food Alternatives
Affordability	*Urban Gardens*
	Community Kitchens
	Social Enterprise Programs

CONTEXT OF FOOD SECURITY CONCERNS

The local and world food situation is being rapidly re-defined by new driving forces. Income growth and distribution, climate change, high energy prices, globalization, and urbanization are transforming food production and consumption. Trend shifts are being noted in the form that is food is being consumed, changing from fresh, whole, preserved and dried foods to highly processed forms. Changes in food availability, rising commodity prices and new producer-consumer linkages are having crucial implications for the livelihoods of poor and food-insecure people, both in developing countries and in the urban and rural communities of industrialized countries such as Canada.

Global hunger and malnutrition, as well as in Canada, continue to prevail and even increase. It is estimated that 35,000 people around the world die each day from hunger. The problems and ill effects of malnutrition impact an even larger number of people, mainly children, women and the elderly. It is estimated that 2.5 million people a year in Canada are dependent on food from food banks.[9] FAO estimated that in 2006, 852 million people were in poverty and malnourished[10], with 815 million of these people in developing countries, 28 million in transitional economies, and 6 million in industrial developed countries.

While there are a large number of people who do not have access to or cannot afford food, there are an even larger number of people who suffer from having too much food, or from consuming inappropriate types of food and processed nutrition. It is estimated that 1.3 billion people were either obese or overweight in the world in 2006, a number that appears to be growing.[11]

Other global developments that are relevant to food security include climate change impacts that contribute to grain shortages and fluctuating food production and raise concerns about sustainability of some areas that we currently depend on for food. Changes in agricultural input costs and accumulation of environmental impacts are challenging the economic sustainability of the food production system.

The most recent financial and economic crisis, precipitated in the United States in the summer and fall of 2008, is having and will continue to have profound negative implications on Canadian rates of employment, consumer disposable income, and in particular, on the poor and food insecure segments of the Canadian economy. The economic crisis in Canada and other countries will have negative effects by increasing the demand for food social assistance of individuals and families who are food

[9] Barbolet, H., MacRae, L. Alexandrer, Cities (plus) Foundation Paper: Agricultural Systems, 2002.
[10] United Nations, Food and Agriculture Organization, World Hunger Report, 2006
[11] Popkin, B. Department of Nutrition and Economic, University of North Carolina, 2006.

insecure. Concurrently the supply of food social assistance from charities and other assistance agencies may decline due to deterioration of general levels of welfare in the whole economy.

Food security has recently become a topic of interest and concern in Canada and other jurisdictions. The interest in food security is a reflection of a number of social, economic and environmental issues, trends in food production, and shifts in values that have come into the public eye.

- Food security has become one of the most critical issues for individuals, cities, and communities. There is a growing concern that the existing food system may not be sustainable and is not responsive to the diverse needs of communities.
- Protection of farm land supply and protection of economically productive farmland from urbanization is fundamental to long term food security. In BC, the high quality of farmland in the Lower Mainland cannot be replaced by land elsewhere in the province. Beginning in 2007 there was a spike in many or most of the agricultural commodity prices internationally, due to a complex number of factors, including the use of human food for biofuels production, speculation on financial commodity markets, as well as droughts in some countries. A recent FAO study indicated that an additional 50 million people became undernourished in 2007 due to higher food prices.[12]
- There is a growing consciousness by consumers that the supply of food is not infinite. This recognition is raising questions about whether the food system will continue to keep pace with the demand being placed on it or will emerging pressures and decisions made today threaten food security in the future. While many do not know how or where food is produced, there is now a growing awareness and desire to understand more about the food supply chain.
- There is a heightened awareness that food will not continue to be "cheap". While cheap food has been an indirect agricultural policy objective for many years, this is changing. The most recent Statistics Canada food consumption surveys have indicated that the amount of the family income spent on food has dropped to about 10.5% by 2004. This ratio may increase as household incomes drop and commodity prices rise.
- There is an increased consciousness by consumers as to the environmental impacts of their actions, and a growing understanding of how food production, manufacturing, distribution and packaging can have major impacts on energy use and green house gas emissions. In particular, there is an implicit recognition that food which is imported several thousand kilometres, either by truck, airplane or train, must have negative environmental impacts.
- There are growing trends by consumers and some retailers to produce and consume locally produced foods. This appears to be a

[12] FAO, Poverty and Under-nutrition, July 2008.

consequence of rising environmental concerns of consumers, and of retailers trying to respond to consumer demands.

- There are social welfare concerns that, as the food system become less accessible due to higher prices and lower affordability, the proportion of food-disadvantaged groups in society will increase. In addition to community food security, higher cost food is likely to have serious implications of nutritional sufficiency, macroeconomic stability and political security.
- There is a further growing concern and fear about how "industrial agriculture" is developing and promoting production and processing technologies that are not environmentally sustainable, may have impacts on genetic diversity, and increasing oligopolistic control of the food system. Trends in national and international industry development are fuelling perceptions that the "system" is pre-occupied with profitability to the grave detriment of consumer wants and food security needs. Supporting smaller scale, local agriculture that is more likely to respond to local consumers concerns, is seen as a way to repatriate the ability to influence food offerings, wholesome choices, and socially acceptable farming practices.

WHAT IS FOOD SECURITY?

Communities are increasingly emphasizing pervasive food issues relating to hunger, nutrition, food safety, and sustainable methods of addressing these problems. Attempts to redress shortcomings of the food system have identified contributory trends and lead to re-focusing on food as part of the social value system. A number of cities, retailers, communities, and countries are taking an interest in how and where their foods are being produced, and about what can they do to enhance the sustainability and security of their food system.

Food security is enabled and impacted through the interaction of a range of political, economic and social structures inclusive of agriculture and food, public health and nutrition, the environment, economic development, public safety and welfare.

Improving the food security of individuals and the community starts with a clear understanding of what is meant by food security in that community.

Definitions of food security have evolved over the last 40 years. In the early 1970's, food security was first defined as

"... the ability to meet aggregate food needs in a consistent way."[13]

The development of the concept originated as a conceptual response to key factors associated with growing world hunger in the 1960's and 1970',

[13] Anderson, MD and JT Cook. 1999. Community food security. Practice in need of theory? Agriculture and Human Values. 16:141-50.

high population growth rates in many countries, and the potential of emerging contributions of food technology in the Green Revolution.[14]

One of the more comprehensive and accepted definitions of food security was developed at the United Nations World Food Summit in 1996.

> ***Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy lifestyle.***

Since then, definitions have evolved to recognize that the food system must be understood in a holistic way in order for to move from focused food security issues such as hunger and food availability to community food security issues respecting the workings of the food system. A definition that has come to be known as the "community food security concept" is the following:[15]

> (Community food security) is *"…a situation in which all community residents obtain a safe, culturally acceptable, nutritionally adequate, diet through a sustainable food system that maximizes community self-reliance and social justice"*

This definition is supported by seven components of community food security: food access, food safety, nutrition, sustainable agriculture (food production), local food systems (community self-reliance), culturally acceptable food, and social justice. [16]

Various other individuals and communities have elaborated on the concept and articulated components to operationalize the definition. An application of the food security concept for BC holds that food security is said to be achieved through the satisfaction of five key components:[17]

- **Availability:** sufficient supply of food for all people
- **Accessibility**: physical and economic access to food
- **Acceptability**: culturally acceptable and appropriate food and distribution systems
- **Adequacy:** nutritional quality, safety, and sustainability of food sources and methods of food supply
- **Agency:** actors, policies and processes to enable actions that ensure food security.

[14] For a discussion, see Lutz, AE, ME Swisher and MA Brennan. 2008. Defining community food security. IFAS Extension Publication #AEC 383. University of Florida. http://edis.ifas.ufl.edu/WC064
[15] Hamm, MW and AC Bellows. 2003. Community food security and nutrition educators. Journal of Nutrition Eductions and Behavior. 35(1): 37-43.
[16] For a discussion, see Lutz, AE, ME Swisher and MA Brennan. 2008. Defining community food security. IFAS Extension Publication #AEC 383. University of Florida. http://edis.ifas.ufl.edu/WC064
[17] Forum of Research Connections (Barbolet, H., et al.) Food System Assessment for the City of Vancouver, October, 2007.

The more traditional components by which food security is understood are the first four of these components. The added concept of "Agency" refers to the role that policies, social organizations and institutions play in food security is critical.

It is important to define these components of food security in the context of the Province of British Columbia and the City of Vancouver in particular.

FOOD AVAILABILITY

Availability relates to the production, distribution, and retail marketing systems (the agri-food system) that can effectively produce and supply food to where it can be purchased and consumed. The current supply system is of necessity, an integration of both locally/provincially produced food, and imported food. Recent studies have indicated that BC is about 48% self-reliant from local production.[18] The province is least reliant with respect to cereal based foodstuffs, and more self-reliant with respect to many meat and dairy products. There needs to be a balance between local and non-local food production and supply. As shown in the next major section of this report, BC is both a major importer and exporter of food, relating to the nature of the agricultural resource base, climatic conditions and economic competitive advantage.

Fundamental to the availability of food is the availability and preservation of productive farm land, the economic viability of food producers, and replenishment of the career force and intellectual capital associated with agriculture. One major concern within the Metro Vancouver area and the Lower Mainland is the loss of farm land base due to urbanization pressures, primarily within the Agricultural Land Reserve but also in any other areas with capability for food production.

Future food availability is likely to be subject to a number of other factors, some of which cannot be qualified in terms of importance or direction of change. Climate change, for example may affect local factors of production such as water, temperature, crop season, etc. However, will it lead to enhanced food production locally and disrupted food production internationally, or vice versa, or widespread shortages worldwide? Planning with food security uncertainty in mind means that society should consider retaining food production options that protect the ability of the community to respond to food supply disruptions.

Ability to acquire food in the face of future scarcity of certain agricultural inputs is another uncertainty with the potential to substantially alter the food security. For example, the use of water and fossil fuel-based energy in agricultural production systems is currently extensive and wasteful. If these inputs are constrained, the impact on local and global food supply could be massive, raising the questions about changes in farming practices that could mitigate these risks locally and the type of planning required to ensure the response is adequate to meet community food security objectives.

[18] BCMAL, B.C.'s Food Self-Reliance, Can B.C.'s Farmers Feed Our Growing Population?, 2006

ACCESSIBILITY

Food security is improved when individuals have both physical and economic access to food. Physical access can be impeded as retail food market consolidation continues. There are currently four major supermarkets in BC and Vancouver – Canada Safeway, Westfair Foods (Loblaws), The Overwaitea Food Group, and H.Y. Louie Company Limited (Sobey's and Marketplace).[19] As the large box stores crowd out the smaller local grocers, this can place a physical and economic burden on certain groups accessing their food, particularly the elderly, handicapped, and low income less mobile individuals.

The more critical barrier to food access is generally affordability. This is directly related to two economic factors, both of which may simultaneously place a barrier on accessibility – the cost of food and the socio-economic conditions within the community and society. Recent international commodity price shocks in 2007 in particular, have drawn attention to the precarious balance that exists between global food supply and demand. In 2006, global cereal stocks, especially wheat, were at their lowest levels since the early 1980's.[20] This resulted in major commodity price shocks for a large range of agricultural commodities, and consumer responses toward the hording of food and political actions by some South Asian and South American countries to limit exports of rice and soybeans. Rising food prices and reduced disposable income in an economic downturn, limits accessibility of food to low income populations.

Growing one's own food for subsistence is an option to improve food accessibility where a land base is available, the resident agricultural knowledge exists, and adequate time and financial investment can be allocated to the pursuit. The idea of individuals growing surplus food for sale off their properties requires additional considerations for the organization of efficient distribution, safe food handling, quality preservation, choice and timeliness, i.e., services that consumers are used to receiving from large and organized distributors in the existing food system.

ACCEPTABILITY

A component of food security is that the food supply be culturally acceptable and delivered through appropriate food distribution systems. With the significant ethnic diversity of the Vancouver region, food demand and needs can be unique with respect to flavours, methods of production, slaughtering, processing and packaging. The systems that traditionally define conventional food distribution and merchandizing vary across ethnic groups. The traditional western food needs are often at odds with the needs of certain ethnic groups. The niche and ethnic markets are excellent examples of how a local growing area can respond to the needs of a portion of a local population. Examples of food suppliers that have increased local food acceptability include the T&T chain of Asian grocery stories, the Indo-Canadian stores, halal butchers and numerous importers.

[19] BCMAL, How to Sell to Major Food Retailers in British Columbia, Industry Competitiveness Branch,2005.
[20] International Food Policy Research Institute (IRPRI), The World Food Situation, New Driving Forces and Required Actions, December 2007.

Acceptability also has implications for the flexibility and responsiveness of the food supply system to respond to consumer demand for locally produced foods. Local agriculture has provided re-emerging opportunities to respond to the community that increasingly wants to know where and how their food is produced. BC agricultural producers have the knowledge and capability to branch out into new specialty products for these markets, as well as provide healthier, fresher, more nutritious and flavourful food options.

ADEQUACY

The adequacy component of food security bridges issues of how food can meet the nutritional needs of the community, that the food is safe from contamination, and that the production systems producing the food are sustainable. The link between food and nutrition is now well established in the medical community. Not having access to adequate nutritious food (food insecurity) is directly related to a range of health issues including poor health, and multiple health conditions such as obesity, distress, diabetes and heart disease.[21] Chronic health issues which are related to food and other factors are not however, necessarily related to income class. In a 2004 US study, the rate of individual chronic health problems remained almost constant across income levels from very poor to wealthy.[22] A major issue with respect to the consumption of nutritious food is related more to education than to income.

Over the past several years, food safety has become more of an issue given a wide range of food contamination problems that have occurred. There have been numerous food recalls of food imports (spinach from the US, and pet food and milk from China are several examples), contaminated meat in 2008 at a major Maple Leaf plant in Ontario, as well as contamination at fast food establishments in North Bay Ontario. This could imply that local self-sufficiency may reduce these risks, simply by reducing the distance and time that food is traveling from the farm to the consumer plate.

Adequacy of our food system also relates to the relative sustainability of the agricultural production system used for food production, the continued availability of productive land, water quality and availability, the use of inorganic chemicals and pesticides, and the environmental impact of food production, processing and transportation. This has led to a focus by many on supporting more organic food production, the emphasis on locally produced food, on issues of animal care, the impacts of urbanization, and on complementary production systems such as community and urban agricultural production.

From a food security perspective, there are several causative factors related to the issues about food adequacy. Fast–foods and snack foods fads have evolved in response to reduced meal preparation time coupled with

[21] Dieticians of Canada and Community Nutritional Council of BC, The cost of eating in BC-the Challenge of Healthy Eating on a low income, October 2001.
[22] Henderson, G., Horvath, J., Growing Burden of Chronic Disease in America, Public Health Report, May-June 2004, Vol 119.

diminished knowledge about how to cook meals from raw ingredients. Corporations have been very successful in developing ubiquitous distribution systems and marketing materials for products that do not spoil, can be dispensed in vending machines at any location, and promote convenience. However, a holistic understanding and dispensing of knowledge of the relationship among dietary intake, exercise, health and lifestyle has not been fully articulated at the consumer level.

Adequacy of the food system implies its sustainability in relation to the agricultural systems used to produce the food, maintenance of the land base, and continued productivity. From a food import perspective, food security concerns include the resource sustainability of farming practices used by food exporting countries and the level of environmental pollution generated by international food procurement systems. At the regional level, the continued ability of the production base to provide local food implies some level of assurance that the land base, resources (e.g., water, air), and productivity of local food production will not be compromised to a degree that threatens local food security. Meaningful information upon which to make informed choices in this area does not currently exist.

AGENCY

Agency is defined as the set of actors, policies and processes that will enable appropriate actions to ensure food security. There should be policies for appropriate food production, land use, food safety, economic, social, and education in place to support food security objectives. However, contemporary food systems are only beginning to be scrutinized from the perspectives of food availability, accessibility, adequacy and acceptability. Funding sources are not readily identifiable to support research in this area, which requires a multi-disciplinary approach to transform traditional economic, agricultural, health, and nutritional indicators into measures and agents of community wellness. One major aspect of this, as has been proposed, is the use of social economy enterprises that produce and distribute food with social and environmental goals.[23]

Agency also has challenges in terms of the breadth and depth of food security issues. Global trends and factors require concerted efforts at the international level to reach consensus. The inability to reach substantive agreement on international agricultural policy at the recent Doha Round of the World Trade Organization talks simply highlights the difficulty in getting independent nations to work together develop and implement common action.

Attempts to develop policies about the food system have been more successful at the national and regional levels.

[23] Ibid, Food System Assessment for the City of Vancouver, Forum of Research Connections, Herb Barbolet, et.al., 2005.

Environmental Farm Plan

Since 2004, the British Columbia Agriculture Council (BCAC) has been delivering the Environmental Farm Plan program in BC. The federal-provincial program is currently under negotiation for the next 5-year period. Agricultural producers are provided technical assistance and guidance to:

- Perform an environmental assessment of their farm operation outlining their risks and benefits
- Develop an action plan to mitigate their agro-environmental risks.
- Producers with a completed and reviewed EFP can apply for assistance to implement the beneficial management practices listed in their action plan through the Canada-British Columbia Environmental Farm Plan Program.

Since the beginning of the program, some 20% of agricultural operators have completed a farm plan and a substantial portion of those operations have invested in environmental friendly practices and projects. Adoption of these practices is making farming operations more environmentally sustainable in BC communities.

BC Agricultural Plan

In 2006, the provincial government launched an industry review leading to the development of "The BC Agricultural Plan: Growing a Healthy Future for BC Families". The plan was completed in February, 2008 and outlines 23 strategies, and 68 action items for sustaining the BC agriculture industry within five key themes:[24]

- **Producing local food in a changing world** – Promoting BC agriculture and food products top support BC producers in supplying fresh, healthy food directly to consumers; and developing a "food miles" program to create public awareness of the distance food products have been transported, and the effect on greenhouse gas emissions.
- **Meeting environmental and climate challenges** – Shifting farm practices to turn agricultural residues like plant material, animal and organic waste into renewable energy; and investing in environmental farm planning, to encourage producers to adopt more environmentally friendly ways of handling their livestock, fertilizer, farm buildings and engine emissions.
- **Building innovative and profitable family farm businesses** – Supporting the agriculture industry in addressing BC's farm labour shortage; and supporting agriculture's diverse sectors in developing sector-specific strategic plans to work towards sustained profitability.
- **Building First Nations agriculture capacity** – Establishing a program to certify First Nations food products prior to the 20101 Olympics; and delivering a "local foods for healthy eating" program for First Nations, including community gardens.

[24] http://www.llbc.leg.bc.ca/public/PubDocs/bcdocs/434802/2008AL0004-000208.pdf

- **Bridging the urban/agriculture divide** - Increasing funding for agriculture in the classroom programs to reconnect children with the source of their food; and reviewing zoning bylaws and farm use bylaws to ensure the regulatory structure supports the sustainable growth of farming in BC.

There is noticeable emphasis on the promotion of BC food products, reconnecting British Columbians with locally grown food, and ensuring the regulatory structure to support the sustainable growth of farming.

BC Climate Action Plan

Also in 2008, the provincial government initiated its Climate Action Plan with the goal of reducing greenhouse gas emissions by 33% by 2020. Included in the strategy is a focus on seven sectors creating significant environmental impacts, including agriculture. In the agricultural sector, the stated objective is to *"…work with the agricultural industry on strategies that may include digesters to capture methane from manure, improved fertilizer application, community biogas digestion/electricity generation projects, research on biomass fuel, green city farms and encouraging local purchase of agricultural products."*[25]

While details are still unclear, there appears to be significant intent to create sustainable market, environmental and regulatory conditions where agriculture can be promoted and enhanced. Two recent fact sheets explore the impact of climate change on agriculture and the potential for farm operators to sell offset projects on farmland that will result in emission reductions and carbon sequestration.[26]

Community Food Charters

A number of local jurisdictions have made strides with Food Charters and food policy organizations to create a sustainable, just local food system in which "farmers can make a living and nobody goes hungry". There are a total of at least 27 regional food security policy organizations in BC, including in the Lower Mainland, BC Food Systems Network, Farm Folk/City Folk, Food For Kidz, Fraser Health Food Security Program, Mission Community Food Coalition, New Westminster Community Food Action Committee, Society Promoting Environmental Conservation (SPEC) Food Safety and Security Committee, Trout Lake/Cedar Cottage Food Security Network, Vancouver Food Policy Council, and Vancouver Native Health Society: Urban Aboriginal Food Enhancement Program.

This orientation toward integrating local food production into social and cultural objectives relating to increasing urban access to local food sources would be anticipated to create more market opportunities for agricultural producers wherever such a program was pursued. Vancouver's Food Policy Council Work Plan, for example, contains a number of initiatives including:

[25] http://www.livesmartbc.ca/government/plan.html
[26] See BC Agri-food sector Climate Action Initiative: Fact Sheet #1 (November 2008) and Fact Sheet #2 (November, 2008)

- Securing zoning and resources for farmer's markets
- Sponsoring forums to link organizations working on food issues
- Securing a land base in Vancouver for community gardens
- Working with other municipalities to create a regional food council
- Promotion of community kitchens
- Mobilization of neighbourhoods through food security networks
- Directing resources towards neighbourhood empowerment
- Pursuing opportunities in social housing for urban gardens, edible landscaping and meal services.

Agricultural Area Planning

In 2008, over 19 BC local or regional jurisdictions have completed agricultural area planning studies and a number of others are in the process of doing so to develop strategies to enhance agriculture in their areas. Since 1990, the Investment Agriculture Foundation and BC Ministry of Agriculture and Lands have provided funding and resources to assist. In jurisdictions where these plans have been completed, planning has lead to assessment of the baseline situation, identification of issues and options, and development of an action plan to implement solutions to local issues.

DEFINING FOOD SECURITY

GLOBAL FOOD SECURITY

While public access to food is an indicator of equitability in the food system at the community level, there is increased higher level concern that the global food system is inherently insecure and in fact, unstable. It is beyond the scope of this report to investigate these contributors to global food security and it is beyond the control of Vancouver and region to influence them to any significant degree. Nonetheless, the alarms stem from a host of developments occurring at the global level that are raising warnings about food security, which are listed here in no particular order.

- Evidence of continued unsustainable agricultural practices and environmental pollution in food producing regions of the world
- Abandonment of the precautionary principle in the uptake of genetically modified food crops and monoculture to address global hunger
- Apprehension about the use of biotechnology and nanotechnology in food production
- Insufficient contingency research and planning to prepare for the effects of climate change, shifting weather, and extreme weather events
- Critical dependence on petroleum to fuel agricultural production systems
- Permanent conversion of land and agricultural resources to non – agricultural use in response to urbanization and short term economic development policies
- Increased dependence on trade to provide food staples and basic food needs
- Spiraling global costs of food in response to regional shortages
- Failure to account for externalities associated with impact of the current global food system
- Destabilizing effect of agricultural subsidies on regional food systems
- Use of food crops for biofuel production in first world countries
- Continued alteration of the life supporting function of the natural environment.

Clearly, there is a need to assess the impacts of global growth and development on the security of our global food system. While this task is complex, agreeing to measures and constraints is likely to be even more daunting. As proponents of the Kyoto Accord have noted, some major developing countries with emerging economies are claiming the right, with concomitant environmental impacts, to pursue the benefits of industrialization that first world countries have already realized.

Food Security In BC And Vancouver

Food security needs to be defined and measured in the context of the achievement of major health, well-being, and equity outcomes with respect to individuals, the environment, society, and the economy.

A working definition of food security in Vancouver and BC as a province is proposed below:

> ***Food security is achieved when the structure and capacity of the food system can meet the food related human, cultural, economic, social and environmental needs of the individual and community.***

The **food system**, the nucleus of this definition, is defined as the integrated process by which food is produced locally, imported, is packaged, processed, distributed / marketed, consumed, and the waste stream managed through reuse, composting and disposal.

This definition has the implication that the current food system is not fully adequate to meet the current and long term needs of the community and society, and that it needs to be adapted and improved. The further implication is that the food system needs to be responsive to a broad range of human, cultural, social and environment needs, and concerns of community versus just responding to the economic and commercial drivers of the food suppliers. And the food system has to be sufficiently resilient to be able to adapt to increasing populations, changing climate, and other "stressors" related to changing availability and costs of agricultural inputs.

Second, the definition is outcome based. That is, efforts to improve food security necessarily will create impacts and have consequences for the human, economic, social and environmental health of individuals and the community. It is also apparent that measures to improve food security will inevitably create the need for changes in ways the existing food system produces and distributes food in the community.

Human Health Outcomes

The way in which the food system makes food available, accessible, acceptable, and adequate, affects the human, environmental, and economic health and the social equality of individuals and the economic health of communities. There are functional relationships between the regions' food system and each of these factors, as is discussed below and illustrated in Figure 1.

The link between adequate and nutritious food and the incidence of major diseases is increasingly being understood by society and western medicine. Either too little or too much food of limited nutritional value is a major contributor to a range of chronic diseases: heart disease, cardio-vascular and degenerative diseases, cancers, diabetes, and obesity, to name a few.[27] Recent studies have found a positive link between childhood nutrition and literacy.[28] The major outcomes that a sustainable food security system

[27] Barbolet, et. Al, Food System Assessment for the City of Vancouver. P.6
[28] Veugelers, P., Children's Lifestyle and School-performance Study (CLASS),Department of Public Health, Published in Journal of School Health, April 2008.

could have, are its impacts on public health indicators such as obesity and the levels and the range of chronic diseases.

Figure 1: The Outcomes of Food Security

Environmental Health Outcomes

The way in which food is produced, processed, distributed and marketed has implications on environmental health. The distance that food needs to be transported from the place of original production to processing and to the point of consumption, directly influences the size of the carbon footprint of the food system. Since 1980, there has been a 25% increase in the distance food travels.[29] It is estimated that in the US, food in the supermarket travels an average of 2,400 kilometres from the farm to the refrigerator.[30]

The other major environmental impact of the food system relates to the production systems used. Ground water pollution, use of pesticides, and organic fertilizers are farming practices that can impact the environment. The reduction in genetic diversity increases the vulnerability of the ecosystem and can contribute to pollution.[31] For example, the number of livestock and plant species that produce most the meat and cereal products continues to decline. Other environmental impacts are related to the amount and type of packaging used in the food system. Organic farming, as well as conventional farming systems that adopt beneficial management

[29] Barbolet, H. et al. 2005. Food System Assessment for the City of Vancouver. P. 14
[30] Pirog, Rich, Benjamin. 2003. Checking the Food Odometer, Comparing Food Miles for Local Versus Conventional Produce Sales in Iowa Institutions, Leopold Centre for Sustainable Agriculture, July.
[31] Fraser, E.D. 2002. Ecologies of Scale: Socio-economic obstacles to sustainable agriculture in the Lower Fraser Valley, British Columbia, Canada, unpublished PHD thesis, P. 32.

practices such as those promoted by the Environmental Farm Program and use of Integrated Pest Management, have the ability to reduce the environmental consequences of the food system, as well as increase the availability of locally produced food. However, while it is relatively easy to track uptake of these beneficial practices for producers of food in BC, Canada, and other first world countries, much of our imported food now comes from locales where the sustainability of agricultural practices is either not known or questionable in terms of environmental footprint.

An obvious outcome of a sustainable secure food system will be understanding, measuring, and mitigating the environmental health impacts on individuals and the community.

Social Equality

There are numerous aspects to social equity An important outcome for a sustainable and secure food system is the contribution it can make to social equality. Social equality relates to the degree of opportunity existing for small farmers within the production system, participation of rural and urban producers within the food value chain, quality of life, regional benefits, and public awareness and acceptance.

Social equality from a food security perspective implies equitable access to food by member of society, regardless of social status. Increased social equity also occurs when people are not malnourished and therefore, tend to learn better, have fewer health and behavioural problems, be less likely to suffer negative effects of addictions, and could be less inclined to engage in criminal activities.

A major challenge is to develop reliable and measurable indicators of social equality, since food security may be only one of the causative factors.

Economic Health Outcomes

The economic health outcome of a sustainable and secure food system is directly related to the level and distribution of economic profits throughout the value chain from input supplier, producer, processor, distributor and end marketer. In addition, this aggregation of profits and costs must allow for a reasonable cost of food to the consumer. Over the years, the relative cost of food, compared to average household income has declined, and Canada has the lowest relative cost of any country in the world.[32] However, at the same time, the use of food banks has increased.

[32] Barbolet, H. et al. 2002. Cities Foundation Series: Agricultural Systems, November.

THE DETERMINANTS OF FOOD SECURITY

TRENDS AND ISSUES AFFECTING FOOD SECURITY

Food security, or the converse, food insecurity, is impacted positively and negatively by a number of factors. Some of these factors are discussed below in Table 1.

Table 1: Summary of Major Factors and Trends Affecting Food Security

Issue Category	Major Issues	Discussion
Environmental	Climate Change	On balance, climate change is expected to have a relatively small negative impact on agricultural productivity in BC compared to many regions in the world, primarily due to increased animal and crop diseases,[33] but also winter floods and summer droughts. The effect is expected vary by region of the province, with the Fraser Valley more or less unaffected.
	Food Systems Carbon Foot Print	Consumers and society increasing concerned about the energy use in food production and transportation, GHG emissions through out production cycle.
	Water Availability	Agriculture is the world's greatest user of fresh water. Much of the worlds' agricultural productivity increased over the last 50 years are explained through the expansion of irrigated land. Urban-rural competition for water, and concerns about supply, are major issues affecting food security. Vancouver is fortunate in having little water availability risk at the present time.
	Natural Disasters (flood, droughts, etc)	This issue is related to climate change. Some evidence that there is an increased incidence of natural disaster. Threat of a flood in the Fraser Valley in 2007 is one example. While high stream flow advisories may be expected more frequently in the winter due to heavy rainfall and localized snowmelt, snow packs are well below normal and water rationing could result in the summer.[34]
	Pathogens, Diseases	The threats of greater disease and pathogens in agriculture and affecting animal and plant agriculture appear to be increasing. The extent of global transport of food, people and materials contributes to the risk. The 2004 Avian Influenza outbreak is one major example of this risk.
	Animal and Plant Diversity	Through plant breeding and genetic modification, the number of plant and animal species that now produce the world's food has dramatically reduced. For example over 80% of Canada's dairy products are produced from the Holstein breed. Almost all wheat in Canada is produced from five varieties, versus over 30 varieties 25 years ago. Biotechnology advances and corporate concentration are leading to less genetic variety in commercial seed and livestock production.

[33] Climate Change Impacts and Adaption Strategies for Urban Systems in Greater Vancouver, Volume 1: Preliminary Assessment The Sheltair Group, 2003.
[34] See record of weather advisories and warnings. http://www.env.gov.bc.ca/rfc/river_forecast/advisories_current.htm

Issue Category	Major Issues	Discussion
Production	Farm Size and Numbers	Average farm sizes are about 28% and 13% larger in Canada and BC, respectively, in the 1986 to 2006 period. The average size of farms in BC is smaller than most other provinces. In Canada, the number of farms dropped 7.1% between 2001 and 2006.[35] The drop in BC was smaller at 2.2%. While the number of Canadian farms decreased 22% in the 1986 to 2006 period, the number of farms in BC increased by 4%.
	Agricultural Production Systems	Increasing concerns expressed about sustainability of certain large agricultural production systems, the use of synthetic chemicals, fertilizers, etc. There is growing use of agricultural resources for meat production, versus plant production, due to growing meat demand in developing countries. Concern about use of more energy, feed, and environment impacts of meat production.[36]
	Organic Production	Growing consumer demand for organic food. Some opinions expressed that organic production is more sustainable and should be expanded.
	Loss of Agricultural Land	Continued conversion of agricultural land for urban use, resulting in loss of agriculture, especially in the better agricultural zones of the province and the Lower Mainland in particular. Urban development has been on some of the better agricultural land historically.
Economic	Oil Prices	The agriculture food system is a major user of energy (of inputs such as fertilizer, cultivation, transportation, processing, packaging). High oil prices directly increase food production costs and food prices.
	Depletion of Resources	Oil is not the only resource that is at it peak. Fish and virtually every mineral used in food production is being depleted and will increase in price as a result.
	Employment, Income	Levels of employment and income have the most profound impact on food security. The potential for a recession and economic slowdown in Canada and BC in late 2008 and 2009 will contribute to greater food insecurity.
	Local Versus Imported Food	There has been a recent concern about the extent of imported food relative to locally produced food. Food security is not necessarily related to the level of imports, or a desire for self sufficiency. A food secure system is one that has a diversity of supply, to mitigate the risks of dependence on only one avenue of supply.
	Food Distribution Systems	A concentrated food distribution system can lead to a concentration of economic power and lack of competition to control prices. Having a variety of distribution systems enhances food security.
	Globalization	Globalization has resulted in both greater exports and imports. There are increasing arguments that not all the impacts are good, and increases financial pressures on farmers, and increasing costs.[37] The recent international financial system crisis may lead to a trend toward de-globalization.
	Income Distribution	More critical than the average level of income, is its distribution. Canada ranks at an intermediate level with respect to income distribution. The GINI index[38] of Canada is 33, compared to the US at 41, many South American countries at nearly 60. In 2006, Demark and Japan had the most favourable GINI index at about 25.[39]

[35] Statistics Canada, Census of Agriculture, 2006. See http://www40.statcan.gc.ca/l01/cst01/agrc25a-eng.htm
[36] Barbolet, H., et al, Cities Plus Foundation Paper Series: Agricultural Systems , Nov 2002.
[37] Ibid, Cities Foundation Paper Series: Agriculture Systems, 2002.
[38] The GINI index measures income inequality on a scale of zero to 100. Zero implies that all income is exactly proportionately shared across the population. A index of 100, means all the income is in the hands of one person, and none with the balance of the population. A low score is good.
[39] UN, World Health Report, 2006.

Issue Category	Major Issues	Discussion
Social	Population Growth	BC's population is expected to grow at a rate of 1.4% annually, one of the highest rates in Canada.[40] Vancouver's population growth may be closer to 2% annually. By 2020, Vancouver's population will be approximately 24% higher that it is today. This means the population in Vancouver will grow by 550,000 over this period, from the current 2.8 million. Greater population in a concentrated area affects food security.
	Regional Distribution of Benefits	A viable food secure system is one in which there is the opportunity for participation of rural and urban individuals and companies in the production, distribution and marketing of food. As concentration grows, the opportunities for regional benefits generally decline as procurement and distribution systems become more centralized.
	Responsiveness to Community Needs	Provincial and local jurisdictions, including Vancouver, are exploring greater roles for local production, by developing provincial and municipal agricultural plans and pursuing community security initiatives and assisting producers to be make their operations environmentally sustainable. Food Policy Councils are implementing Food Charters to improve food systems for community residents by supporting local food production and increasing accessibility to sustainable food production and distribution networks
	Education	Lack of education is a major constraint to food security. The lack of knowledge and understanding of individuals with respect to nutrition and the benefits of eating a balanced diet are important. This is an issue across income classes, which is compounded by the pervasiveness of advertising and availability of fast foods and snacks.
Policy/Regulatory	Food Safety	The food safety issues Canadian consumers faced in 2007 and 2008 brought this issue to the forefront for the industry. The effect of the approach that the federal and provincial governments have taken in response, starting with meat inspection and more stringent regulations of slaughter plants, has reduced consumer access to locally grown product.
	Land Use	Policies must be in place to ensure that local productive agricultural land remains and many different types of agriculture have the land base to thrive locally. Definitions of productive agricultural land need to account for not only soil capability characteristics, but also factors such as climate, topography, proximity to markets, and other attributes that favour non soil-based production systems (e.g., greenhouses). Soil quality, by itself, is not the only useful measure of whether the land is good for agriculture or not. There is a need to modify policy to allow more urban agriculture.

[40] BC Stats, Statistics Canada.

Primary Determinants of Food Insecurity

Table 1 above provides a broad list of factors that may impact and affect the level of food security in a region or province. Before measuring and beginning to deal with regional food security issues, it is critical to attempt to determine the root causes of food insecurity. Policies, initiatives and system modifications to improve food security can then be developed.

Food security status can be defined in three ways[41]:

1. **Food Secure:** no indication of difficulty with accessing food at any time
2. **Food Insecure Moderate:** indication of compromise in quality and/or quantity of food consumed, and
3. **Food Insecure Severe:** indication of reduced food intake and disrupted eating patterns

The level of food security is directly related to a number of factors. The most important factors that directly impact on the food security status of individuals and communities are:

1. **Affordability:** The financial ability of individuals to purchase food is directly related to both the level of income and the price of food. Affordability speaks directly to the accessibility component of food security. The food may be available, acceptable, and adequate, but the individual must be able to have the financial resources to purchase it. According to Health Canada, this is considered the critical issue with respect to an individuals' food security status and, in 2004, 10.4% of the population in BC were food insecure.[42] Of this proportion, 6.9% were moderately food insecure, and 3.5% were severely food insecure. This compares with all of Canada that on a whole had a 9.2% food insecurity status.. One indicator of affordability is the number of people who receive income assistance. In DTES in 2007, 9.3 % of young people between 18 and 26 years of age received social assistance. The other districts of Midtown, City Centre, Northeast and South Vancouver, the percent receiving income assistance was 3.6%, 2.8%, 2.0% and 2.0% respectively.[43]

   The practice of residents growing their own food may have some potential to improve food accessibility, provided land is made available for this purpose. The option of preserving foods would work around the seasonality of BC production, but would likely require substantial training of residents on how to process food into safe and nutritious products.

   In the Lower Mainland, land availability and the preservation of good farmland are central to ensuring affordability and availability of food.

2. **Knowledge:** Information on the relationships between nutrition and health is a critical component affecting the food security status

[41] Health Canada, 2004. Canadian Community Health Survey, Nutrition, 2004 Income-Related Household Food Security in Canada.
[42] Ibid, Health Canada
[43] BC Stats

of individuals. A major concern, particularly with respect to young people, has been the consumption of fast foods with low nutritional value, leading to a range of diseases such as diabetes, or leading to other later life chronic diseases. Being able to afford adequate quantities of food does not lead to a food secure system if poor choices are being made on food nutrition. Another issue with respect to knowledge is labelling. Information presented to consumers on nutrition, GMOs, origin, and sustainability of the supply system (environmental, social, economic, and human health), improves their consumers knowledge and the basis on which they can make informed food choices.

3. **The Food System**: The other main issue that directly affects the food security status of cities and individuals is the food system that produces, manufactures, distributes and markets food. If the system is not able to make food available, accessible, acceptable and adequate, the status of food security will be compromised. A critical element of the food system is the use and management of the agricultural land base and the economic viability of producers.

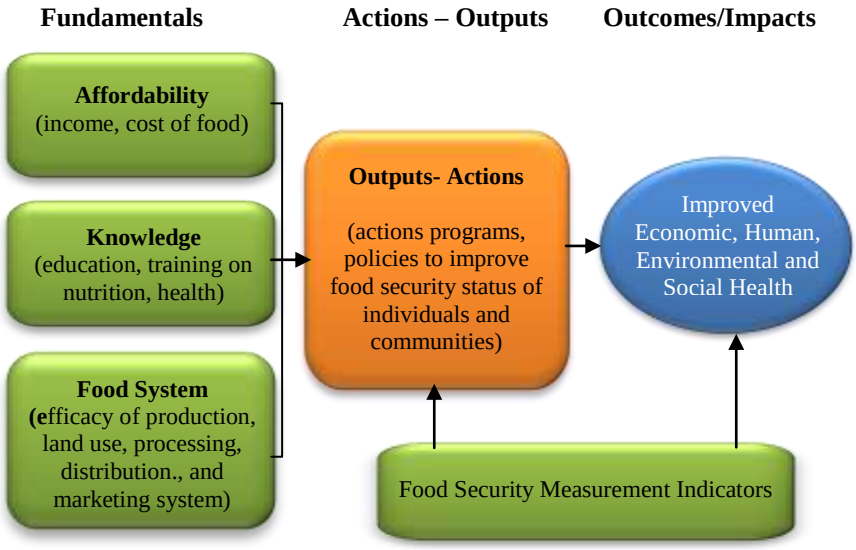
   A significant proportion of local producers do not have the production capacity to service large retailers and wholesalers, making it absolutely vital that they develop local food distribution networks to access consumers. These networks are currently less efficient than the conventional food system, in part because of higher distribution costs that cannot be downloaded to the consumer as they are by large retailers. However, local small scale production has the potential to provide community based market and quality attributes which larger food suppliers and retailers cannot target, and as such contributing directly to community food security. Pursuing local sourced food helps to keep local farmers economically viable, supports value-added industry, and counteracts the pressure of urban development on rural lands.

   Food security also encompasses the concept of the ability of a food system to supply food requirements in the future. Significant risk to community food security is introduced by over-relying on a food system that procures food elsewhere, where the changes in the factors of production cannot be influenced or managed, and where global supply shocks can lead to immediate local food shortages.

These three fundamentals provide the basics through which the food security status of an individual, community or region can be measured, and provides the focus by which such actions can be taken to bring about change in food security status.

Figure 2 provides a logic model by which these fundamentals can be linked to a set of actions, which would lead to desired changes to the food security status of a community. The fundamentals affecting food security status provide the focus or rationale for the selection of different actions that could impact on the food security status of a community. Actions that make food more affordable, provide knowledge about food nutrition and health, and sustain the food system have the potential to contribute to the four desired outcomes of a food secure community – improved economic, environmental, social, and human health.

Figure 2: Enhanced Food Security Logic Model



The possible tools and actions that could be taken to improve the level of food security are identified and benchmarked in the later section "Food Security Tools" of this report.

EXTERNAL FOOD SECURITY MODELS

There are many new and novel food security models proposed or in place in North America. Three alternative models or examples in other communities and cities that can offer direction with respect to the efforts of the Vancouver Food Policy Council in enhancing food security in this region are San Francisco, Waterloo, and Portland. These are briefly reviewed below. It is known there are many other models that could also be included.

SAN FRANCISCO

A study completed in 2008 focused on determining the potential of San Francisco to be self-sufficient in producing their food within 100 miles of the city.[44] This study was in response to the trend toward eating local, and to the concern that local farmland was being lost to urban development.

Within 100 miles of San Francisco, there is a huge capacity for agricultural production. Even more so than in Vancouver and the nearby Fraser Valley production area, the food potential of this city and area is one of the highest in the United States. Nonetheless, the study has identified a need to preserve the diversity of the agricultural resources locally available in order to support a range of food products and the need to protect its scarcest and most valuable agricultural resource: irrigated crop land. Other resource challenges include continued availability of land and water, protection from invasive species, and the competition between agriculture and wildlife habitat. The lessons to be learned from this study include the following points:

- the current food system is geared to deliver inexpensive, standardized food products;
- the "story behind the food" message has/is not being delivered;
- the primary challenge is to improve the access (physical and economic) to food of low-income consumers;
- to increase the consumption of local food, there must be much greater traceability capacity to identify the origin of the food production;
- consumer education is a key ingredient for educating individuals as to what foods are in season, nutrition, and locations of availability;
- capital, know-how and infrastructure is necessary to enable producers to transition to growing more for local markets, in addition to global markets; and
- rapid and relentless development pressure, speculation, inflated land prices, urban-rural conflicts, and wasteful land use are threatening San Francisco's ability to secure its food supply.

[44] Thompson E., AM Harper and S. Kraus. 2008., Think Globally-Eat Locally, San Francisco Foodshed Assessment, American Farmland Trust.

WATERLOO REGION

A major assessment was done in the Waterloo region to document the state of the food system.[45] A major focus of this assessment was with respect to issues of public health and nutrition, being funded primarily by the public health authorities. They define a healthy community food system as one in which the processes involved in the food system are integrated to enhance the environmental, economic, social and nutritional health of the geographic community.[46]

The assessment was focused on describing the objectives and strategies/ actions that they are taking to develop a healthy food system in the Waterloo region. One issue motivating the Waterloo food study was their limited agricultural land base and encroaching urban development. The major strategies they have developed are important lessons to be learned from this study.

- Forge a dynamic partnership to implement a community food system plan.
- Strengthen food-related knowledge and skills among consumers.
- Work with existing planning departments/government to address agricultural policy issues.
- Increase the availability of healthy food.
- Strengthen the local food economy.

PORTLAND

In 2002 Portland became involved extensively in improving food security in the city. A first component was to do a community food assessment and a market basket survey to determine whether residents were food insecure, and if so, how gaps could be addressed. In 2004, the city commissioned an inventory of city owned lands that could be suitable for agricultural uses. This led to the Diggable City report and project, which has resulted in the development of extensive agricultural production in the city from this unused land, community gardens, and roof top gardens.

Lessons to be learned from the food security efforts in Portland include:

- there can be significant potential within the limits of the city for agricultural production, especially in the US where suburban development models have led to higher vacancies in land within cities compared to the more dense development of Vancouver;
- all stakeholders in the community must be involved and engaged;
- the city bylaws and policies must be harmonized and supportive; and
- there is a major role for entrepreneurship and education to ensure successful outcomes.

[45] Miedema, J., et al, A Healthy Community Food System Plan for Waterloo Region, Region of Waterloo Public Health.
[46] Ibid, page 3.

FOOD PRODUCTION, IMPORTS AND EXPORTS

One of the determining factors in food security involves food production. Reliable local production of food generally increases food security, although it depends on what type of food is available and at what price. Risk diversification might suggest that at some level, food security might be negatively impacted by increased local production. For example, where climate limits the production of a specific crop, the retail price of locally produced food may be too expensive for many consumers. Also if 100% of a particular product is produced locally, and there is a local environmental disaster, the absence of other supply chains might decrease food security.

The need for, and impact of, imports and exports can be debated. Conventional economic theory suggests that the welfare of two countries can both be enhanced if each country produces and exports food or other products in which it has a comparative cost advantage, and imports products of which it does not have such an advantage. It is concurrently argued that with the advent of large global international trading and manufacturing corporations, trade is not always based on this conventional wisdom.

Overall, there is the need to have a balance between locally grown and imported food. Imported food is often a requirement where BC, due to climate and other physical limitations, is unable to produce certain food products. Further, imports can be part of a process of risk diversification in providing protection from crop failures, and ensuring price competition.

A significant proportion of locally grown food is for export. Exporting food, and the growing of food for export does strengthen the agriculture infrastructure of the agricultural sector and farming within the ALR, making it more possible to diversify and increase production for local markets.

This section of the report examines both in a quantitative and qualitative way the food production in the Greater Vancouver area, as well as in the province of BC. The level of imports and exports is also considered in this section. In subsequent sections we will consider how the supply compares to food consumption and to nutritional needs. The key issues discussed in this section include food production by category in the Metro Vancouver area and in the province of BC, food imports and exports, land use for the Vancouver area, and issues around agriculture practices and how food is produced.

Metro Vancouver, as used in the subsequent analysis, includes the City of Vancouver proper, and the associated Consolidated Census Subdivisions of Burnaby, Maple Ridge, Surrey, Richmond, Delta, Pitt Meadows, Langley, Greater Vancouver A, and Richmond. It does not include the Fraser Valley Regional District (FVRD), inclusive of Abbotsford, Kent, Mission, and Chilliwack.

AGRICULTURAL PRODUCTION

Estimates of food production have been made largely based on the 2006 Census of Agriculture. While there have been shifts in production since the Census, we believe it is the most consistent source of information for agricultural production in the Metro Vancouver and Lower Mainland, and for the province of BC. This analysis has been completed on both crop and livestock products.

The Census data provides basic information on crop acreage, greenhouse production area, and livestock inventories both provincially and by districts. We refer to this basic information as the units of production. Table 2 below shows the units of production of key crops in the province of BC and specifically within the Lower Mainland region of BC, which includes the Census Districts of the Fraser Valley[47], Greater Vancouver[48], Sunshine Coast, and Squamish-Lillooet.[49]

Food production specific to the Metro Vancouver region is examined in Tables 4, 5 and 6 in the next section.

Yield estimates per acre and per animal are then used to translate the Census data into overall production estimates[50]. For example, vegetable production includes field vegetables, greenhouse vegetables and potato crop area. The units of production for these categories are then multiplied by an estimated yield: for example ten tonnes to the acre for field vegetables.

On a tonnage basis there is significant production of most of the food categories. Dairy, vegetables, fruit, chicken and fish are the most abundantly produced in the Lower Mainland and in the province of BC. While coarse grains, beef and pig meat are not widely produced in the Lower Mainland, beef is produced in significant amounts in other regions of British Columbia. In addition to what is shown on Table 2, there is a small amount of honey production in Vancouver and in BC. Oilseed and pulses are not produced in any significant quantities in the Lower Mainland. There is moderate production of oilseeds in the Peace River region of BC, at a fair distance from Vancouver.

The section "Food Consumption and Demand" following this major section, translates the tonnage of food production into per capita consumption.

[47] Including the subdivisions of Abbotsford, and Fraser Valley subdivisions B, D, E, F, G,
[48] Including the subdivisions of Langley, Surrey, Delta, Richmond, Burnaby, Pitt Meadows, Maple Ridge, and Greater Vancouver subdivision A
[49] See map in http://www.statcan.gc.ca/ca-ra2006/m/bc-cb2b-eng.pdf
[50] Yield estimates for livestock are based on inventories, which are often different that yield per animal. For example cattle are generally kept for 3 years on average, chickens for 8 weeks, and the yield per animal has to be adjusted up or down to reflect its relation to average yield be year.

Table 2: Summary of BC and Lower Mainland Production, 2006

Category	Units of Production in Lower Mainland (Hectares and Livestock Inventory)	Units of Production in BC (Hectares and Livestock Inventory)	Yield (tonnes) per Unit of Production	Production in Lower Mainland (tonnes)	Production in BC (tonnes)
Vegetables Field	7,967	10,396	22.90		
Vegetables Greenhouse[1]	2,364,178	2,523,522	0.04		
Vegetables (Total)				276,255	339,071
Fruit	9,078	19,822	11.21	101,751	222,172
Milk	52,355	72,756	8.79	460,288	639,647
Eggs (tonnes)	2,515,107	3,111,480	0.02	39,990	49,473
Fish	19,011,993	76,047,971	0.002	37,073	148,294
Poultry	12,780,973	14,942,613	0.01	186,887	216,712
Beef	75,346	728,099	0.10	7,174	69,321
Pig	100,476	135,826	0.13	13,241	17,900
Sheep, Lamb	9,074	61,033	0.02	181	1,218
Coarse Grains [2]	2,433	82,171		5,221	192,024

Source: Stats Canada, 2006 Census of Agriculture; FAO Statistics (Yield Estimates); Serecon (Yield Estimates)
[1] Greenhouse vegetable unit of production and yield and based on square meters of production
[2] Coarse grains in BC are almost entirely produced for feed, rather than food, and include wheat, barley, oats, and rye

Notes:
1. The production of entirely non food crops has not been included in this section. This includes hay, forage crops for dairy production, sod and nursery. Forage crops for dairy production are an essential part of making milk and dairy products, so they are being used for food, but processed through the cows.
2. The production of some minor crops like canola and pulses has not been included in this section as production is very limited.

Imports And Exports

One complicating factor in looking at food supply is estimating the volume of food that is imported and exported. This trade is both international and domestic (within Canada). While trade figures can be found for international trade, it is more difficult to estimate trade within Canada. For example, some of the BC production of vegetables and fish is shipped to other provinces, and thus is not available for local consumption. However, in the absence of good trade figures we can only estimate the volume of domestic trade. These estimates are made based on a review of the known production, local consumption, and international exports/import, reasonable valuations can be extrapolated. In addition, there is a great deal of product imported from other provinces such as coarse grains, although most of this is used for livestock production and does not directly enter the food chain.

Table 3 shows the estimate of international and domestic trade in the major food categories.

When we bring the production and trade figures together we begin to get a picture of food availability in the Vancouver area. Table 4 shows the availability of food in Vancouver and in BC by combining both the production and trade data.

Table 3: Import and Export of Food to and From BC (tonnes)

	BC Imports (International)	BC Imports (Domestic)	BC Exports (International)	BC Exports (Domestic)
Vegetables	375,743	150,000	195,169	50,000
Fruit	256,241	150,000	84,129	25,000
Milk	9,615	-	4,645	-
Eggs	6,584	-	1,264	-
Fish	41,591	-	51,667	50,000
Chicken	9,623	-	13,510	25,000
Beef	71,398	-	1,540	-
Pork	29,300	50,000	16,198	-
Lamb, Sheep	26,968	-	61	24,000
Coarse Grains	226,211	942,422	46,396	-

Source: Stats Canada, Serecon Estimates

Table 4: Food Production, Imports, Exports and Availability (tonnes)

Category	Production in Lower Mainland (tonnes)	Production in BC (tonnes)	BC Imports (International)	BC Imports (Domestic)	BC Exports (International)	BC Exports (Domestic)	Used for Other Purposes Lower Mainland	Used for Other Purposes BC	Total Food Available BC	Total Food Available in Lower Mainland	Local Food Available in Lower Mainland	Provincial Food Available in BC
Vegetables	276,255	339,071	375,743	150,000	195,169	50,000	-	-	619,645	334,120	76,506	93,902
Fruit	101,751	222,172	256,241	150,000	84,129	25,000	-	-	519,283	250,829	51,772	113,043
Milk	460,288	639,647	9,615	-	4,645	-	-	-	644,616	314,796	316,481	635,002
Eggs	39,990	49,473	6,584	-	1,264	-	-	-	54,793	26,446	23,715	48,209
Fish	37,073	148,294	41,591	-	51,667	50,000	-	-	88,218	43,227	18,537	46,627
Chicken	186,887	216,712	9,623	-	13,510	25,000	-	-	187,825	77,694	75,146	178,202
Beef	7,174	69,321	71,398	-	1,540	-	-	-	139,179	68,198	7,014	67,781
Pig	13,241	17,900	29,300	50,000	16,198	-	-	-	81,002	40,116	13,241	17,900
Lamb, Sheep	181	1,218	26,968	-	61	24,000	-	-	4,125	2,051	181	1,218
Coarse Grains	5,221	192,024	226,211	942,422	46,396	-	306,340	784,262	530,000	259,700	261	9,601

Source: Stats Canada, 2006 Census of Agriculture; FAO Stats; Serecon

The above analysis demonstrates the origins of the food supply in Lower Mainland and the Province of BC. It points to the existence of significant production in many food categories. It also demonstrates that food imports and exports play a significant role in the food supply.

The following Tables 5 and 6 show more explicitly how much of the food produced in the Lower Mainland and in BC remain in the region for consumers to purchase, and how the production in the Lower Mainland and in BC compares to the overall supply. Table 5 shows a realistic assessment of current self sufficiency. Table 6 shows the potential of the local production to supply the food needs if all the local production was redirected to the local market.

Table 5 demonstrates that the level of local production relative to the overall supply of food is highest within the dairy, egg, and poultry categories. In these categories, approximately 90% or more of the supply comes from BC, with a high percentage originating from the Lower Mainland. By this measure BC is essentially completely self-sufficient in its production of these commodities. This is not surprising as these categories are all supply managed. BC production of beef and fish supply approximately half of the requirements of food in these categories, although much of the beef production is outside of the Lower Mainland area.

BC production of fruits, vegetables, pork, and lamb makes up between 10% and one-third of the overall food available to BC consumers. By this measure, BC is relatively non-self-sufficient in these commodities. It is even less sufficient in coarse grains, where less than 2% of the food available comes from BC sources. The limited production of course grains is primarily a function of a limited amount of suitable cereal crop land in the province.

Table 5: Estimates of Local Food Availability Relative to Total Availability, BC and Lower Mainland (tonnes and %)

Category	Total Food Available in BC	Provincially Produced Food Available in BC	Availability of BC Production as % of Total Food Available in BC	Total Food Available in Lower Mainland	Lower Mainland Produced Food Available in Lower Mainland	Availability of Lower Mainland Production as % of Food Available in Lower Mainland
Vegetables	619,645	93,902	15%	334,120	76,506	23%
Fruit	519,283	113,043	22%	250,829	51,772	21%
Milk	644,616	635,002	99%	314,796	316,481	101%
Eggs	54,793	48,209	88%	26,446	23,715	90%
Fish	88,218	46,627	53%	43,227	18,537	43%
Poultry	187,825	178,202	95%	77,694	75,146	97%
Beef	139,179	67,781	49%	68,198	7,014	10%
Pig	81,002	17,900	22%	40,116	13,241	33%
Lamb, Sheep	4,125	1,218	30%	2,051	181	9%
Coarse Grains	530,000	9,601	2%	259,700	261	0%

Source: Source: Stats Canada, 2006 Census of Agriculture; FAO Stats; Serecon

Table 6 demonstrates that BC has the potential to increase its supply into the local markets relative to what is currently available (Table 5). This is particularly evident for fruits, vegetables, and coarse grains. For example, BC produces between 55 and 83% (Table 6) of the total vegetables required by the market on a tonnage basis, while only 15 to 23% (Table 5) of locally produced food actually enters the local market. This second analysis is not realistic however, as it does not take into account the seasonality of production and the diversity of product being consumed.

Table 6: Estimates of Food Availability Relative to Production (tonnes, %)

Category	BC Production	Total Food Available BC	BC Production as a % of Total Food Available in BC	Lower Mainland Production	Total Food Available in Lower Mainland	Lower Mainland Production as a % of Total Food Available in Lower Mainland
Vegetables	339,071	619,645	55%	276,255	334,120	83%
Fruit	222,172	519,283	43%	101,751	250,829	41%
Milk	639,647	644,616	99%	460,288	314,796	146%
Eggs	49,473	54,793	90%	39,990	26,446	151%
Fish	148,294	88,218	168%	37,073	43,227	86%
Poultry	216,712	187,825	115%	186,887	77,694	241%
Beef	69,321	139,179	50%	7,174	68,198	11%
Pig	17,900	81,002	22%	13,241	40,116	33%
Lamb, Sheep	1,218	4,125	30%	181	2,051	9%
Coarse Grains	192,024	530,000	36%	5,221	259,700	2%

Source: Source: Stats Canada, 2006 Census of Agriculture; FAO Stats; Serecon

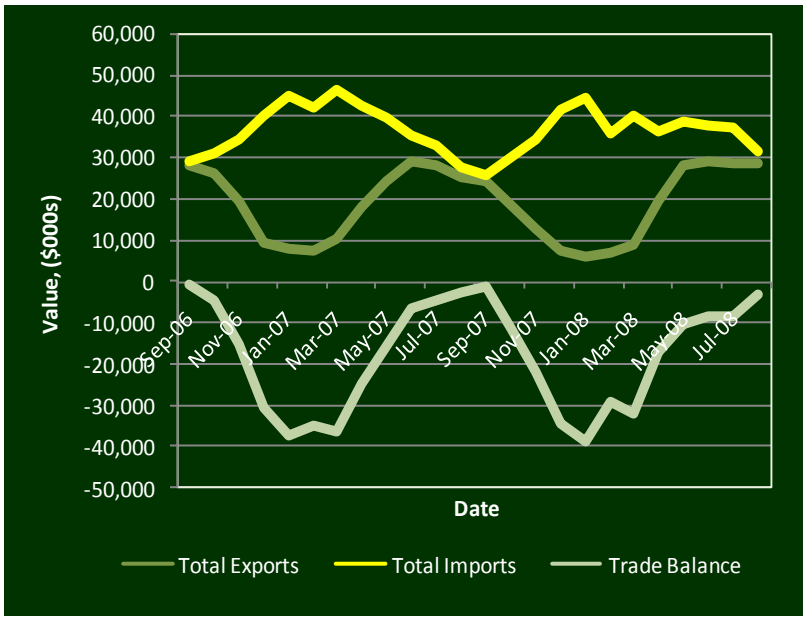
The seasonality of production is important, as BC still has a seasonal climate. While year-round production is possible in greenhouse production, it is not possible in the field. However, the additional heat and light required for greenhouse production during the winter season often makes the costs much higher than imported product. The food accessibility of imported vegetables in the winter is therefore greater than locally produced food, as imports are currently more abundant and cheaper. Figure 3 shows the seasonality of imports and exports that impact the availability of food.

The diversity of product being consumed has an impact on how much local production enters the market. This is really an important consideration in fruit and vegetables. There are some fruits and vegetables that are not produced in BC due to a cooler climate and higher costs of production. These products subsequently have to be imported, displacing the amount of local production that can enter the market. In order for local production to fill a higher percent of total food supply, either production would have to be established in more diverse products, or consumer diets would have to

change to match the local production. This issue is perhaps most obvious for fruits. Virtually all of the fruit production in Vancouver is from cranberries, blueberries, raspberries, and strawberries. For BC as a whole, one can add apples, cherries, grapes and pears to the production base. On a tonnage basis, BC produces enough of these fruits to supply 40% of its needs, although only about half of it reaches the market, with the rest being exported. It may be unrealistic to keep all of this in the local market, as it would require a significant shift in diets, and the seasonal production would have to stored or frozen in order to last year-round.

There is the potential for the increased diversity of crop production using alternative crop production techniques and new greenhouse technologies. This is an area that could be further studied and evaluated.

Figure 3: Seasonality of Vegetable Imports and Exports to BC



A special issue relates to coarse grains. While BC produces as much as 36% of the coarse grains required to meet the total supply, most of the production is currently used as livestock feed. There is the potential to divert some of the higher quality grain for human consumption with the lower quality grains being used as feed for livestock.

METRO VANCOUVER LOCAL PRODUCTION

The above food supply analysis focused on the province as a whole, and on the Lower Mainland. The analysis is now extended to include the local production capability within Metro Vancouver. The results are shown in Table 7. As is indicated, about 423 million tonnes, or about 22% of the provincial total was produced in Metro Vancouver in 2006.

Table 7: BC and Local Food Production (tonnes)

Product	BC	Lower Mainland	Metro Vancouver
Vegetables (Total)	339,071	276,255	197,329
Fruit	222,172	101,751	53,865
Milk	639,647	460,288	69,410
Eggs (tonnes)	49,473	39,990	4,172
Fish	148,294	37,073	37,073
Poultry	216,712	186,887	58,475
Beef	69,321	7,174	2,051
Pig, Pork	17,900	13,241	505
Sheep, Lamb, Mutton	1,218	181	94
Honey	1,516	509	216
Coarse Grains	192,024	5,221	
Total	**1,897,348**	**1,128,570**	**423,190**
Percent of Province		59.5%	22.3%

The local food production in Metro Vancouver represents less than 20% of its local demand.

Production By Land Area

Although the production and trade figures described in the previous sections explain the origin of the food supply in Metro Vancouver and in BC, it is also interesting to consider how land is used. Not all land is available for agricultural purposes, and not all agriculture land is used for food production. The following tables describe the current uses for land, both agricultural and non-agricultural, using Statistics Canada Agriculture Census data.[51]

The other statistical source is the series of Land Use Inventories (LUIs) undertaken in various municipalities in the Lower Mainland (see Table 11). Those inventories are based on drive-by assessments of land use in the ALR and are considered more accurate to describe actual use of the land, area of land in food production, "unused" agriculture land (which is land that is available for agriculture expansion) and "alienated land"(which is considered unavailable for agricultural production).[52]

The comparison between Table 8 and Table 11 reveals that the proportion of land held by Census farming operations and not used in agriculture (17.7% Census data), compares favourably with LUI data (indicating that 20% of the agricultural land base is in non-farm use). Nevertheless, the LUI data for the Lower Mainland should be analyzed to get more accurate accounting of the availability of the land base for food production in specific areas and potential for future conversion, change of use, and/or expansion.

[51] The Statistics Canada Agriculture Census records farming activity on all farms reporting $2,500 or more in gross revenues per year. The farms tend to be located in the Agricultural land Reserve (ALR) because that land is reserved for agriculture, however, many farms are located on land outside of the ALR. F farms do not report farming income for taxation purposes, they will not be included in the Census.

[52] Sutherland, Kim. 2008. Regional Agrologist. BCMAL. Personal Communication.

Table 8: BC Land Use, Agriculture Census. 2006

Category	Hectares	% of Total
Land in crops (excluding Christmas trees)	60817	51.5%
Summer fallow	178	0.2%
Tame/seeded pasture	8133	6.9%
Natural land for pasture	27,540	23.3%
Woodlands and wetlands (woodlots, sugarbush, tree windbreaks, bush, ponds, bogs, marshes, sloughs)	10,434	8.8%
All other land (idle land, lands on which farm buildings, barnyards, lanes, home gardens and mushroom houses are located)	10,419	8.5%
Greenhouses	444	0.4%
Christmas trees	524	0.4%
Total	**118,089**	**100.0%**
Used in Agriculture	97,192	82.3%
Not used in Agriculture	20,897	17.7%

Source: Stats Canada, 2006 Census of Agriculture

Table 8 indicates that about 82% of land reported in the 2006 Census of Agriculture is used for productive purposes. Taken together, this would seem to indicate that local production and therefore food self-sufficiency could be increased, but only by moderate amounts.

Table 9: BC Land Used in Crop Production

Land in Crops	Hectares	% of Total
Wheat	821	1%
Oats	565	1%
Barley	622	1%
Grain corn	262	0%
Silage corn	8,617	14%
Rye	482	1%
Alfalfa	4,861	8%
Other tame hay	22,123	36%
Forage seed	825	1%
Potatoes	2,579	4%
Vegetables	5,388	9%
Fruits, nut, berries	9,078	15%
Nursery products	3,002	5%
Sod	468	1%
Other crops	1,124	2%
Total (1)	**60,817**	**100%**

Source: Stats Canada, 2006 Census of Agriculture
Notes: (1) This total matches the first row of Table 8, Land in Crops (excluding Christmas trees)

Table 10: BC Productive Land Used for Food and Non-Food Production

Categories	Hectares	% of Total
Livestock	74,026	76.2%
Vegetables	7,967	8.2%
Fruit	9,078	9.3%
Other Food Crops	1,124	1.3%
Sod and Nursery	4,819	5.0%
Total	**97,192**	

Tables 8 to 10 show how the 118,000 hectares of land in the Lower Mainland declared in the 2006 Census of Agriculture, is distributed. Approximately 18% of land is in woodlands, buildings, or is idle. Of the 82% of land that is productive, about 94% of is used to produce food. Most of this (76%) is used for livestock production, while 18% is used for fruit and vegetable production. Only 6% of the production area is used for non-food purposes. The majority of this is used to produce sod, nursery, and tree products. This land, while not in food production, does serve an environmental benefit.

A high proportion of land in the Lower Mainland is in tame hay production. While tame hay is used to support dairy and other livestock production, it is also a predominant low intensity use as pasture by small hobby/part-time livestock operations and the equine sector. As such, this component of the land base has untapped potential for human food production.

Greenhouse production for vegetables, flowers, herbs, and propagation is a highly intensive and highly visible land use in the Lower Mainland with considerable production, income and employment effects. However, the combined area represented by greenhouse production is about 4,440,000 square meters, which is equivalent to 444 ha or only about 0.7% of the total Lower Mainland area in crop production (see Table 9) and 0.4% of the land held by Census agriculture operations (see Table 8). About 53% of the greenhouse area is used for vegetable production. From a food security perspective, there is considerable potential to increase food production using intensive protected systems in the Lower Mainland, as well as generate significant volumes of products for export. Currently, about 80% of the greenhouse vegetables produced in BC are exported to the US.

On a fresh weight basis, greenhouse vegetable production accounted for 30% of all vegetables produced[53] in the Lower Mainland in 2004, the last year for which statistics were kept.[54] On a tonnes per hectare basis, greenhouse vegetables out-yielded field vegetable production in the Lower Mainland by a factor of 28 (437 tonnes vs. 15.4 tonnes per ha).

[53] This includes estimates of sales to fresh wholesale sales, farm and roadside, and processing.
[54] BC Stats. 2004. Annual BC Horticultural Statistics. http://www.agf.gov.bc.ca/stats/2004HortStats.pdf

This land use analysis points to a few conclusions. First, land used for agricultural purposes still dominates the rural landscape of Vancouver. Table 11 demonstrates that 74% of land in the Land Use Inventories database is being used for agricultural purposes. Approximately 20% is being used for non-agriculture purposes. There is and additional estimated 6% of land that could be used for agricultural production that is currently idle or could be switched to agricultural production.

The analysis demonstrates is that while there may be some ability to increase agriculture production in Metro Vancouver, the majority of land is being put to productive use either for food or non food purposes.

Since the creation ALR in 1974, the area of land reserved for agriculture has changed through a process of inclusions and exclusions to the land base. In the period beginning with the creation of the ALR and ending in March, 2008, BC as a whole has experienced an increase in ALR land base of 1.2%, however, almost all of that increase has occurred in less productive areas in the Interior of the province. In the most productive areas for agriculture, Metro Vancouver has experienced a net reduction in ALR land base of 5,925 ha, or a decrease of 8.9%. The Fraser Valley Regional District has experienced a net reduction in ALR land base of 5,804 ha in the same period, or a decrease of 6.5%.

This trend can be expected to place increasing pressure on the sustainability of existing levels of agricultural production in the Lower Mainland. In addition, continued expansion of various allowed non-farming uses in the ALR (e.g., agro-tourism, recreational facilities such as golf courses, and industrial uses) are also potential threats to food producing land base. The indication is that further gains in regional agricultural food production are likely to be realized only through intensification of farming operations or dramatic policy shifts leading to the reclamation of land for food production. The change in ALR land base is presented in Table 12, below.

Table 11: Areas of Land Use in Selected Areas of Metro Vancouver and the Fraser Valley Regional District, from BCMAL Land Use Inventories (LUIs) and Agricultural Area Plans, in Hectares

Category	Maple Ridge	Surrey	Kent	Delta	Abbotsford	Chilliwack	Langley	Pitt Meadows	Richmond	Total
Unused farmland	1,076	795	229	161	1,911	232				4,404
Agriculture	2,201	5,864	4,346	7,396	21,205	12,302	9,496	5,000	3,012	70,822
Residential use	25	284	20	57		192	5,855		472	6,905
Not in use	388	152	0	344		73	1,091			2,048
Hobby - Amenity use	127	164	89	74		236	3,595			4,285
Park	153	352		58			765			1,328
Institutional use	44	15	55	20		101	59			294
Land in transition	19	47		9		1	223			299
Commercial/service use	7	132	9	24	1,243	44	68	468		1,995
Unknown	11	118		3						132
Mineral extraction	133		64		209	29	56			491
Recreational use	27	40	3	31		26	125			252
Transportation & communications	1	55	4	564		232	156			1,011
Utility	1	1	18	27		7	12			66
Water management	1	6	46			767				820
Golf course	1	476	40	135		230	296			1,178
Vacant	1									1
Mobile home park		16					39			55
Freshwater aquaculture		28	2				4			34
Wildlife management area		93		301				794		1,188
Treed hillside			138		1,487					1,625
Water, wetland or shoreline			2			221				223
Agri-commercial/agri-industrial			15							15
Industrial use				4		37	57			98
Indian Reserve/Crown land				218		41	510			769
Cultural/entertainment use						1	0			1
In agriculture including. hobby farms	2,328	6,028	4,435	7,470	21,205	12,538	13,091	5,000	3,012	75,107
% of land in agriculture	55%	69%	87%	79%	81%	85%	58%	80%	61%	74%
In agriculture or available for agriculture	3,792	6,975	4,664	7,976	23,116	12,843	14,182	5,000	3,012	81,560
% of land available for agriculture	90%	80%	92%	85%	89%	87%	63%	80%	61%	80%
Non-Farm Use	422	1,663	416	1,451	2,939	1,929	8,225	1,262	1,904	20,211
% of land in Non farm use	10%	19%	8%	15%	11%	13%	37%	20%	39%	20%
Total Area of Land Use	**4,226**	**8,692**	**5,079**	**9,427**	**26,055**	**14,772**	**22,430**	**6,262**	**4,916**	**101,859**

Sources: Municipal Land Use Inventories conducted by BCMAL since 2001; and agricultural profiles that accompanied municipal agricultural area plans

Table 12: Area Included and Excluded from the ALR by Regional District, in Hectares, For the Period from 1974 to March 31, 2008

Regional District	Area at Designation	Inclusions	Exclusions By Application		Total Exclusions	Area as of Mar 31, 2008
			Gov't	Private		
Alberni Clayoquot	7,935	805	958	84	1,041	7,699
Bulkley Nechako	297,611	70,500	1,710	462	2,172	365,939
Capital	19,595	289	664	2,155	2,819	17,065
Cariboo	925,506	18,405	14,326	4,075	18,400	925,510
Central Coast	4,453	53	0	65	65	4,442
Central Kootenay	71,539	799	7,315	1,073	8,388	63,949
Central Okanagan	33,077	210	4,513	2,695	7,207	26,079
Columbia Shuswap	67,409	1,364	15,448	2,458	17,905	50,868
Comox Strathcona	43,725	5,258	6,544	1,814	8,357	40,626
Cowichan Valley	21,984	415	3,628	1,052	4,680	17,719
East Kootenay	272,510	346	803	6,649	7,452	265,404
Fraser Fort George	349,636	42,425	9,981	1,632	11,613	380,448
Fraser Valley	76,803	415	3,837	1,552	5,389	71,829
Greater Vancouver	66,839	233	3,743	2,415	6,158	60,914
Kitimat Stikine	64,170	3,146	456	381	838	66,478
Kootenay Boundary	55,061	291	1,124	849	1,973	53,379
Mount Waddington	1,741	17	0	120	120	1,638
Nanaimo	21,053	1,880	3,119	1,340	4,460	18,473
North Okanagan	70,283	1,536	4,683	1,263	5,946	65,873
Northern Rockies	45,554	603	786	195	981	45,176
Okanagan Similkameen	86,478	2,165	1,934	2,958	4,892	83,750
Peace River	1,453,434	26,641	212	2,249	2,461	1,477,614
Powell River	14,130	502	4,925	161	5,086	9,546
Skeena-Queen Charlotte	43,887	80	20	167	187	43,780
Squamish Lillooet	27,126	939	2,632	291	2,923	25,141
Sunshine Coast	6,275	17	1,824	424	2,249	4,044
Thompson Nicola	568,705	2,134	1,396	2,854	4,250	566,588
Total	**4,716,516**	**181,463**	**96,581**	**41,432**	**138,013**	**4,759,967**

(Source: BC Agricultural Land Commission. http://www.alc.gov.bc.ca/alr/stats/Table2_incl-excl_RDallyears.htm)

Organic And Other Production Practices

The manner in which food is produced is another issue related to food security. Food is generally accepted to be more adequate if it is produced in a sustainable manner. Good environmental and social practices as they relate to farm production increase the adequacy of food. Organic production is one measure of these types of sustainable production practices, although naturally produced meat, lower uses of pesticides, and cutting down on transportation greenhouse emission are all practices that improve the adequacy of food.

Adequacy is however only one measure of food security and it is generally a personal judgement. One consumer may place value on this sort of production practice, while another will place no value on it at all.

Organic production is one indicator that can be measured and its use has been increasing in the last 10 years, driven largely by consumer demand. Estimates of organic production have been made and are shown in Table 13. These figures have been estimated from the 2006 Census of Agriculture and include both certified and uncertified farms that use organic protocols. Based on the number of farms relative to the number of conventional farms, we have estimated the total volume of organic production in Vancouver and in BC relative to the total production.

Table 13 indicates that an estimated 13% to 17% of fruit, vegetables, and crops are produced organically. This compared to only about 1% of the livestock products. While organic production is only one measure to improve sustainability, this would indicate that there could be continued growth in the adequacy of food production from local sources.

A number of other initiatives are also occurring in BC that assisting farmers in adopting more sustainable farming practices. These practices range from increased conservation tillage, cover cropping, integrated pest management, beneficial re-use of agricultural waste products, to completion of Environmental Farm Plans (and implementation of on-farm environmental projects). Nevertheless, while uptake of these practices can be quantitatively measured quite easily, their use as indicators of improved food security requires additional investigation and possible modification to develop feasible rationales and practical methodologies for establishing the meaningful linkages between uptake and food security outcomes.

There is also potential to differentiate in the marketplace local food products produced under sustainability protocols. Sustainable food products can be made more noticeable to consumers through labelling and branding that communicate meaningful community food security attributes and increase demand for locally produced food.

Table 13: Estimated Quantity of Organic Production Relative to Conventional Production, in Tonnes, BC and Lower Mainland

Category	Lower Mainland Production	Estimate of Organic Production (Lower Mainland)	% of Total Product Category	BC Production	Estimate of Organic Production (BC)	% of Total Product Category
Vegetables	276,255	34,919	13%	339,071	56,016	17%
Fruit	101,751	12,861	13%	222,172	36,704	17%
Milk	460,288	4,098	1%	639,647	4,819	1%
Eggs	39,990	356	1%	49,473	373	1%
Fish	37,073	330	1%	148,294	1,117	1%
Poultry	186,887	1,664	1%	216,712	1,633	1%
Beef	7,174	64	1%	69,321	522	1%
Pig	13,241	118	1%	17,900	135	1%
Lamb, Sheep	181	2	1%	1,218	9	1%
Coarse Grains	5,221	660	13%	192,024	31,723	17%

Source: Source: Stats Canada, 2006 Census of Agriculture; FAO Stats; Serecon

Summary Of Food Production And Supply

Overall this section has attempted to evaluate the primary food supply for the Metro Vancouver. It has analyzed both local production and imports and exports. There is good local production in vegetables, fruit, milk, eggs, poultry, fish and beef.

In terms of self-sufficiency BC produces essentially all of its own supply for milk, eggs and poultry.

BC produces nearly enough fish and nearly enough vegetables to meet its supply needs. However, because of seasonality in production, and production that is specialized on a limited number of products, there are significant imports and exports that make up the total supply picture. Far less local production actually enters the local market as a result. About 20% of the total vegetable supply for BC and Vancouver comes from local sources, while this figure is closer to 40% or 50% for fish.

While BC produces adequate levels of fruit and other meat products, the local production is bolstered by imports. Self-sufficiency in these commodities is generally between 10 and 50%. BC is not at all self-sufficient in the production of coarse grains, where it is estimated that less than 2% of the supply comes from local sources.

Other issues around production that have been evaluated in this section are the distribution of land by use and the prevalence of sustainable practices. Overall about 80% of the land that could be put to agriculture use is productively employed. Local production could be bolstered by some idle land, although this figure is likely less than 6% of total land area, or 6,000 to 7,000 hectares.

Of the land that is producing, the vast majority of it is directed to food products. Approximate 94% of producing land is used to produce food, although the majority of it (76%) is used for livestock products.

Particular farming sectors are more prolific producers of food than others. On a per hectare basis, greenhouse vegetable production out yields field vegetable production by a factor of over 28 times per unit. How these food production systems compare on a sustainability basis is unclear. There is underutilized farmland in the Lower Mainland held in low intensity hobby and recreational land uses. The potential contribution of this land base to community food security has not been established.

Measures of food security can also include uptake of sustainable production practices which impact adequacy. Proxies for sustainable practices are organic production, conservation practices, Integrated Pest Management, and Environmental Farm Plan produced food. The relationships between sustainability indicators and meaningful changes in food security are currently undeveloped.

There are significant information gaps that make discussion of the adequacy and use of the regional land base for community food security unclear and point to the need for further investigation to establish

meaningful indicators and benchmarks for assessing changes in food security. These include:

- Incomplete understanding of the full effects of urban encroachment on food production capability;
- Unknown capacity of the agricultural system to ramp up human food production and the consequences of doing so;
- Is there a balance among exports, imports and seasonality and crop options for local production/processing that makes most sense as a feasible food security goal for the region;
- The empirical argument for the relationship between sustainable food practices and improved food security needs to be clearly articulated
- What types of policy shifts are required to move the community toward more sustainable local food production that would increase food security

FOOD DEMAND ANALYSIS

A critical aspect of understanding food security in BC and Vancouver, both now and in the future, is to quantify demand for each of the different types of food products.

Food is defined as any substance taken into an organism to nourish or stimulate it in order to keep it alive and enabled to grow and repair tissue. Importantly, it is a value judgement as to whether a particular substance that is a source of substandard nourishment is qualified to be a food. Unhealthy food and beverage choices are often used to supply nourishment to the human organism for reasons related to a host of factors including lifestyle, food access, and social preferences. Moreover, the substitution of unhealthy food choices for healthy ones nevertheless represents a source of caloric intake that must be accounted for in any food security assessment.

FOOD DISAPPEARANCE

The demand for food is measured by Statistics Canada on the basis of disappearance or consumption. This is a very important distinction.

Disappearance is the amount that is originally produced at the production level before it enters the value chain. Throughout the value chain - transportation from the field, through processing, at retail, and in the home - a considerable portion of the quantity of food is lost, destroyed or thrown out. The magnitude of food loss is significant. As reported by Statistics Canada[55], consumption can be a low as 20% of the original production quantity. For example, the level of consumption of beef is only 43% of the disappearance quantity. This implies that for each kilogram of beef that is produced, only 43% is actually consumed and that 57% is lost within the food supply system. For vegetables, up to 50% of the production is lost before consumption. Each food type has a different consumption to disappearance ratio. On an aggregate basis, approximately one-half of the food produced in Canada is not consumed but lost, destroyed or thrown out within the food value chain. This level of wastage is a major concern in an environment of food scarcity. Making the food system more efficient would be one of the more significant developments to increasing local or global food security, and an indicator of food security.

One benchmark indicator suggested is the rate of food wastage, with less wastage implying greater food security. A study should be done on what can be done to decrease wastage, and which food group would be the best candidate to meet multiple goals with food wastage.

[55] Statistics Canada, Canada Food Statistics Database, 2005 Edition

BASELINE FOOD CONSUMPTION

An analysis of per capita disappearance of all the basic food products consumed in Canada and BC has been undertaken. This analysis is based on a study completed for Agriculture and Agri-Food Canada by Serecon Management Consulting in 2005[56]. This study conducted a qualitative assessment of all major food trends in Canada, and conducted a quantitative analysis of historical and projected food disappearance and consumption between 1984 and 2020.

As a starting point in assessing the food demands in BC, the per capita disappearance of all the major food products consumed in 2005 provides a baseline. Disappearance is more critical in measuring food security, as this is most reflective of the production levels needed. It is noted that per capita consumption values estimated by Statistics Canada are at the national level only, and these values must be extrapolated to BC.

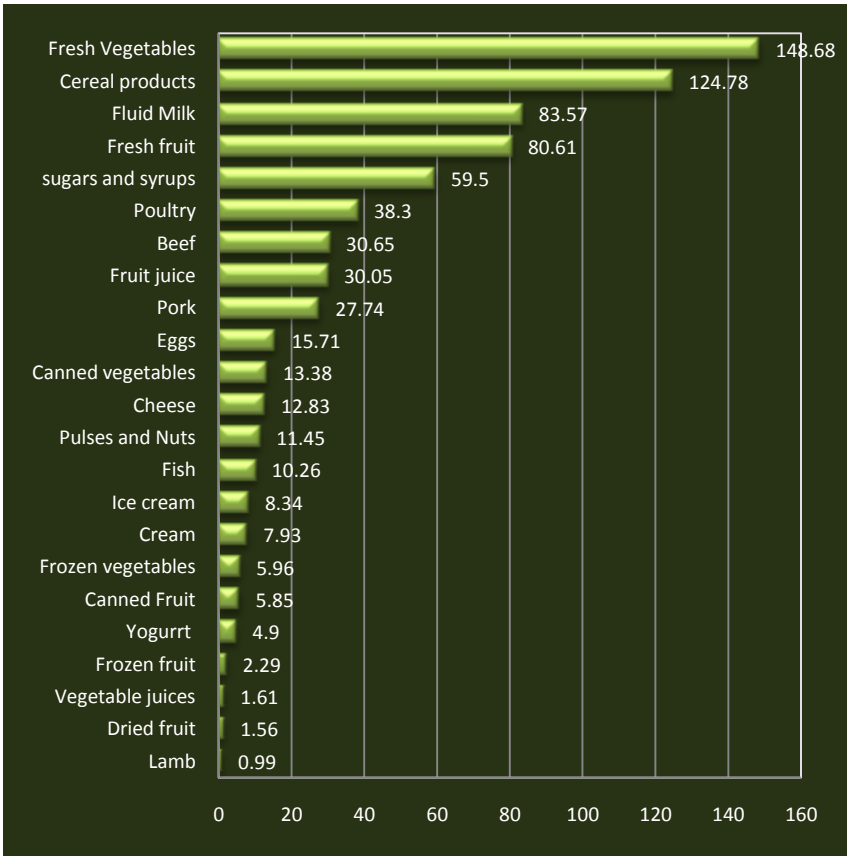
As illustrated in Figure 4, the greater per capita disappearance of food products are fresh vegetables, cereal products, dairy, fresh fruit, and sugars and syrups. Smaller quantities are consumed of lamb, dried and frozen fruit, yogurt, fruit juices, canned fruit and frozen vegetables. On a daily basis, based on this analysis, about 2.2 kilograms of food is needed to be produced per person per day in 2005. The amount of this that was consumed averaged about 1.2 kilograms per person in Canada. This value would likely be transferable to BC.

In a separate category, the consumption of beverages[57] is included. Beverages need to be considered as part of the food security question, as a major proportion of the calories consumed come from beverages. If food consumption habits are modified to exclude beverages, then the caloric requirements need to be derived from other sources. Figure 5 summarizes the annual consumption of the major categories. On an aggregate basis, 426 litres of beverages were consumed, which represents about 1.2 litres per person per day. Beverages are on a disappearance basis, with the actual consumption being about 65% of this amount or 800 ml per person per day.

One weakness of the Statistics Canada food consumption measurements is that they are not measured on a provincial or regional basis, but only at the national level. This assumption that national trends represent BC food and beverage consumption should be investigated further before indicators of community food security for Vancouver are benchmarked, particularly since BC's ethnic, income and employment profile is substantially different that of the country as a whole.

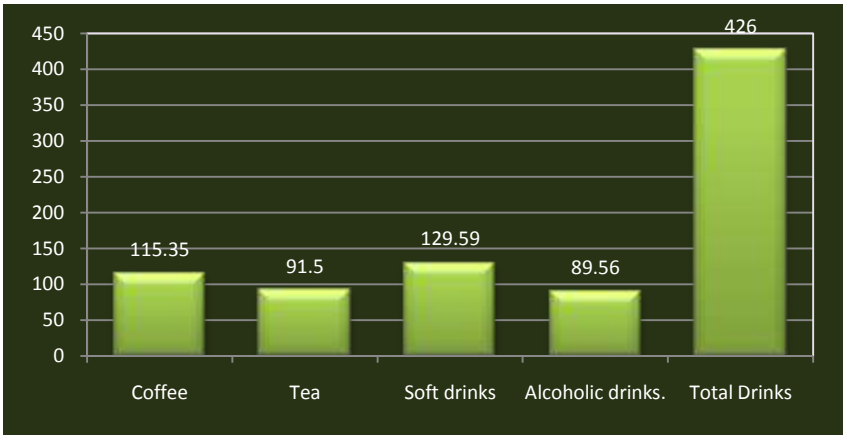
[56] AAFC, Canadian Food Trends to 2020: A Long Range Consumer Outlook, prepared by Serecon Management Consulting, 2005.
[57] Statistics defines beverage as tea; coffee; cocoa; beers stout, porter and ale; distilled spirits; wines,; soft drinks; and bottled water. See http://www.statcan.gc.ca/bsolc/olc-cel/olc-cel?catno=32-229-XIB&lang=eng

Figure 4: Annual Per Capita Disappearance of Major Food Products, 2005 (Canada, Kgs)



Source: AAFC, Canadian Food Trends to 2020: A Long Range Consumer Outlook.

Figure 5: Canadian Per Capita Consumption of Beverages, Litres, 2005



Source: AAFC, Canadian Food Trends to 2020: A Long Range Consumer Outlook.

Food Consumption Trends In British Columbia

The disappearance and consumption analysis for food has been extended to describe how disappearance has changed historically and to project possible changes over the coming years. Food is defined as the standard meat, vegetable and dairy consumer products as indicated in Table 14.

Table 14 measures the per capita disappearance of all essential food products consumed in BC between 1984 and 2005, and projected to 2020.

Table 14: Historical and Projected Per Capita Food Disappearance Rates in BC

Food Product	Per Capita Disappearance (kgs)			Consumption Ratio	
	1984	2005	2020	2005/ 1984	2020/ 2005
Beef	39.09	30.65	26.65	0.78	0.87
Pork	28.19	27.74	28.05	0.98	1.01
Lamb	0.79	0.99	1.39	1.25	1.40
Poultry	25.04	38.3	50.29	1.53	1.31
Fish	8.69	10.26	13.01	1.18	1.27
Total Meats and Fish	**101.8**	**107.94**	**119.39**	**1.06**	**1.11**
Fluid Milk	100	83.57	73.21	0.84	0.88
Cheese	8.24	12.83	15.16	1.56	1.18
Cream	4.41	7.93	11.89	1.80	1.50
Ice cream	11.73	8.34	4.39	0.71	0.53
Yogurt	1.7	4.9	7.9	2.88	1.61
Total Dairy	**126.08**	**117.57**	**112.55**	**0.93**	**0.96**
Eggs	**17.06**	**15.71**	**16.38**	**0.92**	**1.04**
Fresh Fruit	68.14	80.61	86.41	1.18	1.07
Canned Fruit	6.09	5.85	6.36	0.96	1.09
Frozen Fruit	1.39	2.29	3.01	1.65	1.31
Dried Fruit	1.42	1.56	1.73	1.10	1.11
Fruit Juice	26.71	30.05	30.07	1.13	1.00
Total Fruits	**103.75**	**120.36**	**127.58**	**1.16**	**1.06**
Fresh Vegetables	125.09	148.68	150.8	1.19	1.01
Frozen Vegetables	3.94	5.96	7.61	1.51	1.28
Canned Vegetables	13.3	13.38	14.07	1.01	1.05
Vegetable Juices	3.83	1.61	1.38	0.42	0.86
Total Vegetables	**146.16**	**169.63**	**173.86**	**1.16**	**1.02**
Cereal Products	**92.14**	**124.78**	**128.4**	**1.35**	**1.03**
Pulses and Nuts	**8.29**	**11.45**	**10.93**	**1.38**	**0.95**
Sugars and Syrups	**55.44**	**59.5**	**74.02**	**1.07**	**1.24**

The projections have been made as part of the referenced AAFC study[58] by statistically correlating each individual food product demand with a variety of economic and social factors such as disposable income, age, immigration ratios, product prices, health indicators (obesity), as well as other factors as applicable.[59]

[58] AAFC, Canadian Food Trends to 2020: A Long Range Consumer Outlook
[59] The correlations were done using an econometric statistical forecasting model.

To measure the disappearance trends of each product, relative consumption ratios have been calculated to determine both historical and future trends. Ratio measures the relative change between two periods. A ratio of 1 to 1 indicates no change between any two periods.

Table 14 also shows that expected trends in consumption of the traditional meats such as beef and pork are expected to remain flat or decline in the future. Other meats like fish and poultry are expected to grow in per capital disappearance and consumption. Traditional dairy products (milk, ice cream) will decline in demand, however cheese and yogurt are expected to increase in demand.

The demand for fruits and to a lesser extent vegetables are anticipated to grow in demand as measured by rates of per capita disappearance. The demand for sugar and syrups will continue to be strong. Pulses and nuts, which historically were growing in demand, are expected to soften in demand.

Aggregate Food Demand

Based on current and projected disappearance/consumption patterns, an aggregation of the total food demand has been approximated for BC and Vancouver.

Aggregate future food demand will be a function of both changes in future individual product consumption trends and of the expected growth in population. Based on current consumption patterns, Figure 6 estimates the quantity of nourishment that would be required to meet Vancouver's food needs in 2020. The form in which this nourishment may be available to residents could change dramatically by 2020, depending on developments in food technology, potential to synthesize more nutritious foods, trading patterns, disease outbreaks, crop failures, and a host of other factors. Nevertheless, the Figure usefully illustrates the increase in food requirement as a function of projected population growth.

New products promoted extensively through mass merchandizing will constantly create new demands for nourishment in different combinations and food forms. There is often angst in the community about the impact of unwholesome foods and the advertising that promotes them so strongly to consumers. Ultimately, however, it is individuals who will be responsible for their food choices. Food security advocates can ensure that information is available on which to make those healthy, balanced selections, that the full implications of insecure food systems are recognized, and that the benefits of a more secure food system are effectively communicated and promoted to members of society at large.

The 2009 population of Metro Vancouver is about 2.33 million (51.8%) of the total BC population of 4.5 million.[60]. The population in BC is projected

[60] BC Stats. http://www.bcstats.gov.bc.ca/DATA/pop/pop/dynamic/PopulationStatistics/SelectRegionType.asp?category=Census

to grow to 5.173 million by 2020.[61] Vancouver's population in 2009 is in the range of 650,000.[62] In Table 15, it may be noted that population growth and associated increased demand (and competition) for food in the 2009 to 2020 period will be stronger in the Lower Mainland and BC as a whole than in Vancouver itself, although all areas are projected to experience growth.

Table 15: Historical Population Growth, Current Estimates, and Projected Population Growth, Various Regions, BC

Year	Vancouver Health Region	Metro Vancouver	Lower Mainland	BC
1991	491,736	1,647,382	1,884,891	3,373,464
2001	578,993	2,073,662	2,382,824	4,078,447
2009	646,495	2,333,513	2,688,279	4,502,321
2020	724,721	2,770,030	3,191,427	5,172,715
Increase - 2009 to 2020	12%	18.7%	18.7%	14.5%
Annualized Rate	1%	1.6%	1.6%	1.3%

Source: BC Stats. http://www.bcstats.gov.bc.ca/data/pop/popstart.asp

The projected aggregate demand for the different food groups is found by the product of the per capita disappearance and the projected future population levels. Figure 6 illustrates the relative expected growth in food demand by product type between 2005 and 2020 on an annualized basis. The expected growth in many products (beef, pork, ice cream, canned fruit, canned vegetables and margarine) is forecasted to be low. The products that stand out the most are vegetables, fruits, cereals and oils, both in absolute size of contribution to current food demand and in future growth rates, based on Canadian food consumption and nutrient intake trends. Canadians appear to be adopting healthier, disease and illness preventing, lifestyles with a focus on zero-trans-fats, low sodium, high fibre carbohydrates, reduced sugar, allergen identification, fortification and health claims.[63] The implications of these food trends for the nutrient composition of future diets is a topic deserving further study. Indicators, which are directly related to key Canadian health risks, include intake levels of calories, carbohydrates, fat, proteins, minerals, vitamins and fibre.[64]

Adding to the debate about the definition of food in relation to food security, the definition of increased food security implies that it is healthy food choices that should be more available, accessible, acceptable, and

[61] Ibid, , BC Stats.
[62] BC Stats, Vancouver Health Region
[63] See Agriculture and Agri-Food Canada. Canadian Foods Trends to 2020. http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1170944121865&lang=eng
[64] See Alberta Agriculture and Rural Development. Canadian consumer trends in obesity and food consumption. http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/sis8438

adequate to all individuals in the community. The preferred community food security objective is to expose the population to a healthier diet, with more fruit and vegetable consumption for health reasons, with the goal of inducing healthier consumption patterns. Realistically, if this goal were to be met, the breakout of raw food requirements could change substantially from current consumption patterns, for example, to even more fruits and vegetables. There is a need for further study to benchmark current food consumption in relation to recommended food intake in order to identify the true food gap that community food security should strive to fill. This study effort could represent an opportunity to collaborate with the BC Health Authority.

Figure 6: Total Food Demand, Metro Vancouver, By Food Type, 2005 & 2020 (Tonnes)

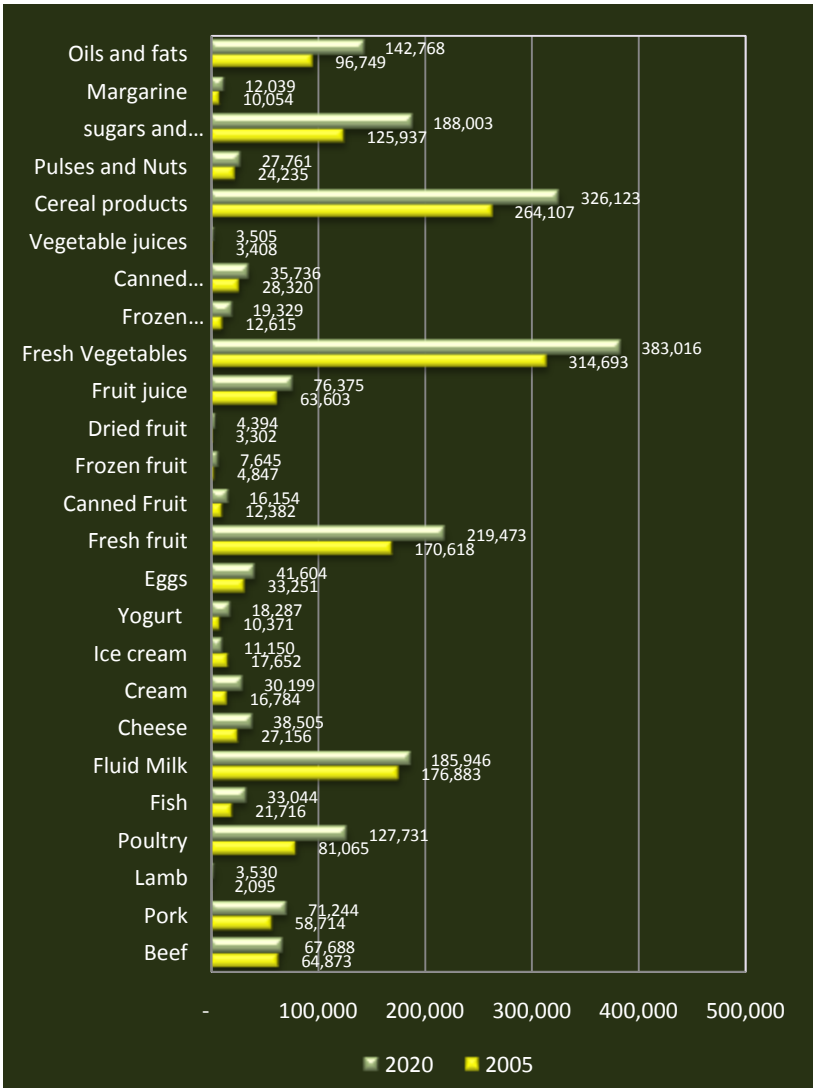


Figure 7 shows similar information to Figure 6, but displayed on an aggregate-by-food group versus individual food products for BC. The quantities for Metro Vancouver are approximately 50% of these provincial values (Figure 8). The largest food demand categories are vegetables, fruits, and cereal products followed by meats and dairy.

Figure 7: BC Current and Projected Food Needs, Tonnes

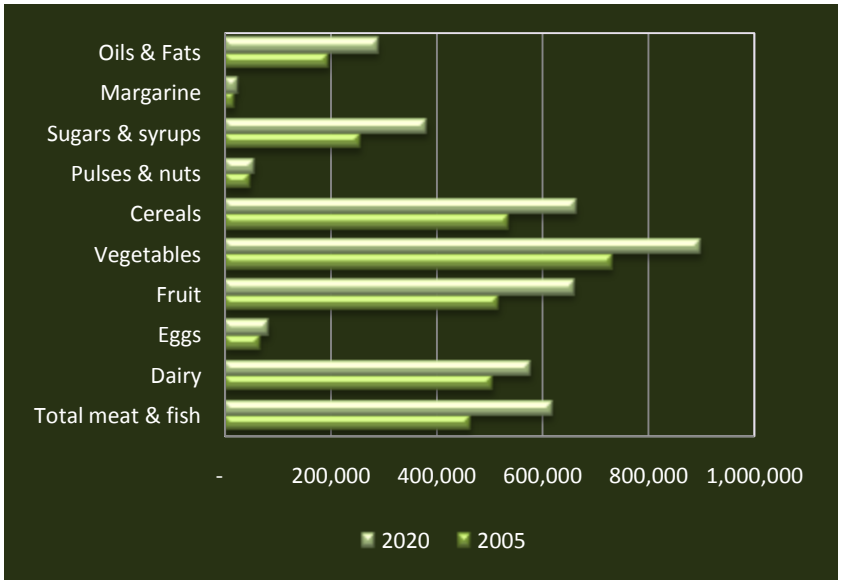
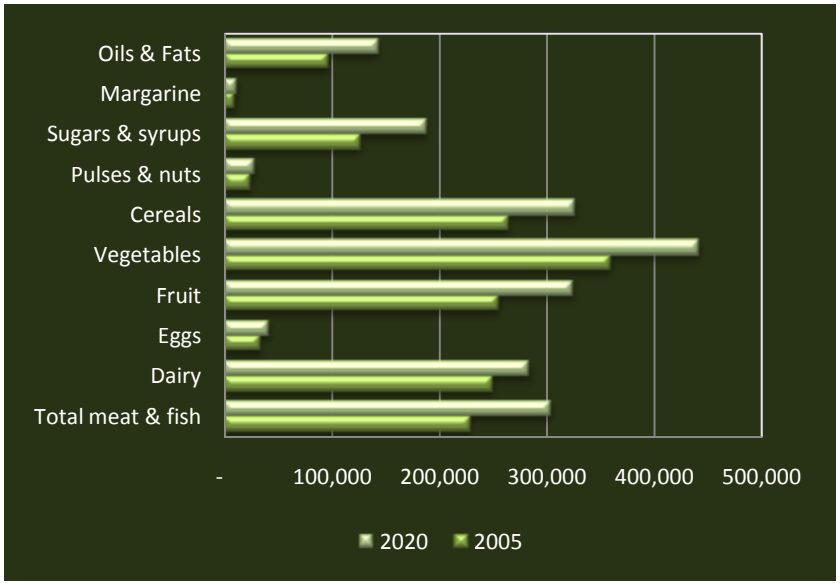


Figure 8: Metro Vancouver Current and Projected Food Needs, Tonnes



METRO VANCOUVER LOCAL FOOD SUPPLY AND DEMAND

Based on current per capita food consumption patterns(Figure 4 and Table 14), population growth trends, the quantity of food that is now and will be demanded per year by 2020 has been estimated for Metro Vancouver and BC.

The current level of food disappearance (as of 2005) for Metro Vancouver was 1,645,430 tonnes. The demand on an annual basis is expected to be 445,820 tonnes greater by the year 2020 accounting both for population changes and changes in consumption patterns. These quantities are the product of the population estimates by 2020 and the per capital disappearance of all the foods that would be consumed at that time. The distribution of the demand by product type indicates the greatest demand for vegetables, followed by fruits and cereal products.

One critical issue is the food wastage that occurs with the food production, processing, distribution, retailing and consumption chain. While the proportions vary by food type, on average, almost one half of the food that is produced (known as food disappearance) is lost or destroyed before consumption[65]. In reality, of the 1,645,430 tonnes of food disappearance in BC, some 48% or 789,800 tonnes is never consumed by the final consumer. In this respect, the food production and consumption system is very inefficient. Clearly, further investigation into where this food is lost in the food delivery chain would assist efforts to target areas where the efficiency of the existing system could be improved.

One critical measure of food security is the amount of food that is or could be produced locally. Figures 9 below, provides estimates of the local supply, food demand, and supply gap for the Lower Mainland and for Metro Vancouver, respectively, both in 2006, and projected to 2020. Currently, the food gap in the Lower Mainland is about 834,000 tonnes of food annually. The gap is defined as the difference between local food production capability and total food consumption needs. For Metro Vancouver[66], which excludes the Regional Districts of Fraser Valley, Sunshine Coast, and Squamish-Lillooet, the food gap is much larger, at about 1.3 million tonnes annually.

To our knowledge, there has been no investigation of the food gap existing between food availability and nutrition needs of the Vancouver region. Illuminating these relationships would assist in articulating the role of local food production and developing strategies to close the gap. It would also be useful to identify how this gap might be affected by population growth and adoption of healthier nutrition intake in the future.

[65] Statistics Canada, Food Consumption and Disappearance, catalogue 21-020-X1E2003001.

[66] Metro Vancouver is the recent name change for the Greater Vancouver Regional District and is comprised of the following areas: Langley, Surrey, Delta, Richmond, Greater Vancouver A, Vancouver, Burnaby, Pitt Meadows and Maple Ridge. Greater Vancouver A includes Bowen Island, the North Vancouver, West Vancouver, Lions Bay, Anmore, Belcarra, Port Moody, Port Coquitlam, Coquitlam, and Barnston Island.

Figure 9: Food Demand, Local Supply and Food Gap, Metro Vancouver and Lower Mainland, 2006(MT)

VANCOUVER AND BC FOOD DISTRIBUTION SYSTEM

OVERVIEW

The food distribution system links food producers and processors to consumers. The food distribution network in BC is overwhelmingly a profit-motivated supply chain that links producers, fishers, and processors with consumers.

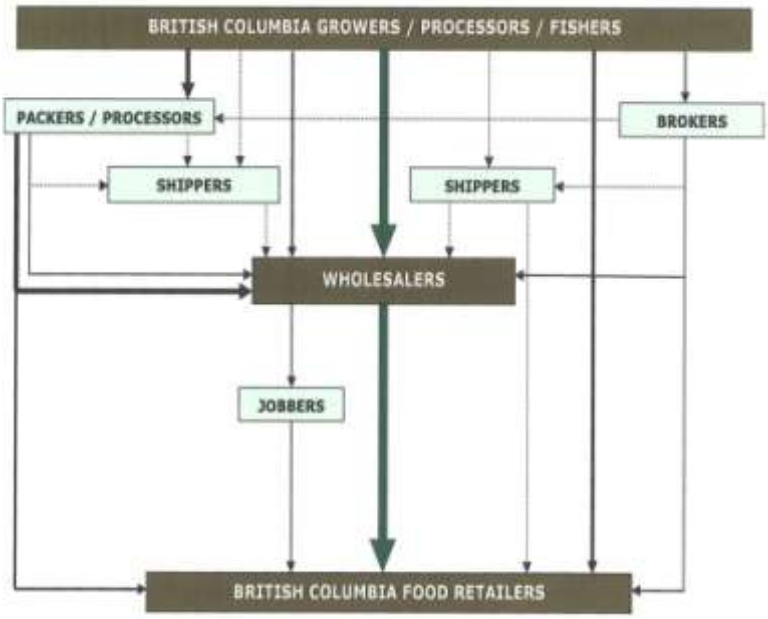
In 2005, the retail sector accounted for about 60% of total commercial food sales in BC ($10.2 billion). The dominant supply route of food to food retailers is through wholesalers, who often are both processors and brokers (see Figure 10).

A description of the participants in the producer-to-retail food supply chain follows:[67]

- **Growers, fishers, producers and processors** – Fresh and processed crop products and fish are shipped directly to packers, shippers, and wholesalers. Packers are involved in the washing, packing, grading and cooling of products. Producers may pack their own products and bypass packers. Almost all fresh meat and poultry products is sent to packers or buyers for slaughtering and packing, prior to entering the food distribution system.
- **Shippers** – are the link between the packer and the wholesaler. The role of the shipper is to transport goods and, in BC, dominates the supply network for food products imported from the US. Shippers tend not to be involved in intra-provincial trade food distribution.
- **Brokers** – locate food supplies to sell or buy and negotiate the sale by acting as an agent on behalf of a producer, shipper or buyer. They are most heavily involved in importing food product (US/and off-shore) and negotiating sales with the retail sector.
- **Wholesalers** – These entities procure food products from all of the above participants and also directly from importers. The products are then marketed to the retail sector. The largest retail companies have their own wholesaling departments. Small retail companies often purchase product that has been purchased from large wholesalers by smaller wholesalers (jobbers) and repackaged.
- **Retailers** – These companies sell directly to food product consumers and are represented by groceries, supermarkets, corner stores.

[67] This section is paraphrased from the Novacorp Consulting Inc. report. http://www.bcfarmersmarket.org/ind/pdf/fsd_manual.pdf

Figure 10: BC Producer to Retailer Supply Chain



Source: Novacorp Consulting Inc. 2006. Guidelines for BC Food Producers & Processors on Selling to Food Service Distributors. Report Prepared for the BC Ministry of Agriculture and Lands. http://www.al.gov.bc.ca/foodprocessing/documents/foodservice_market/final_fsd_marketing_sales_manual.pdf

The remaining 40% of commercial food sales in BC ($6.8 billion) is accounted for by the foodservices sector (see Figure 11) and is found in sales to hotels, restaurants and institutions (HRI).

A description of the participants in the producer-to-foodservice food supply chain follows:[68]

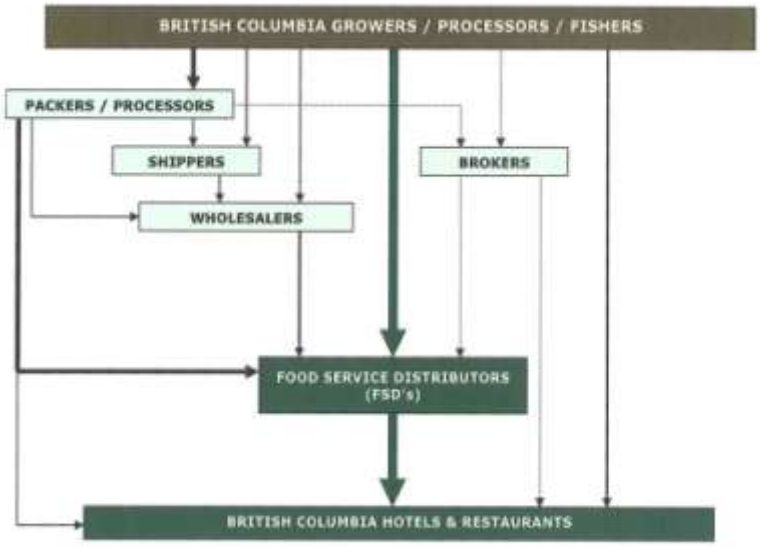
- **Growers, fishers, producers and processors** – Food service distributors will seek out producers, packers, shippers, wholesalers and processors of fresh and processed crop products, fish and fresh meat and poultry products. Scale and capacity of this stage of the supply system is critical since the largest food service companies require abundant, year-round, sources of raw food for their international operations. The volume of foodservice products that is a distributed by primary producers to hotels, institutions, and restaurants is typically low, mainly due to difficulties related to sole sourcing reliable supplies of consistent, high quality, products year-round.
- **Shippers** – can be a link between the packer and the food service distributor. The role of the shipper is to transport goods and, in BC, dominates the supply network for food products imported from the

[68] This section is paraphrased from the Novacorp Consulting Inc. report. http://www.bcfarmersmarket.org/ind/pdf/fsd_manual.pdf

US. Shippers tend not to be involved in intra-provincial trade food distribution.

- **Brokers** – In BC, brokers are minimally involved with services to HRI. They can be involved in importing food product (US/and off-shore) and negotiating sales to the foodservice distributors.
- **Wholesalers** – These entities procure food products from all of the above participants and also directly from importers. The products are then marketed in to food service distributors. Large foodservice companies often have their on wholesaling departments. Small foodservice companies often may purchase product that has been purchased from large wholesalers by smaller wholesalers (jobbers) and repackaged.
- **Foodservice Distributors (FSDs)** – These companies are the primary conduit for food flows between producers and the hotel, restaurant and institutional (HRI) sector. All FSDs undertake some degree of repackaging, sorting, product deconsolidation, storing, peeling, and slicing to fashion their product lines to the special needs of their clients. Large international FSDs control the lion's share of the foodservice business in BC. Smaller independent FSDs perform essentially the same role but cater to small restaurants and regional foodservice markets.

Figure 11: BC Producer-to-Restaurant Supply Chain



Source: Novacorp Consulting Inc. 2006. Guidelines for BC Food Producers & Processors on Selling to Food Service Distributors. Report Prepared for the BC Ministry of Agriculture and Lands.
http://www.al.gov.bc.ca/foodprocessing/documents/foodservice_market/final_fsd_marketing_sales_manual.pdf

GROWERS / PRODUCERS / FISHERS

The primary agricultural and fishery sectors harvest raw food stocks. With notable exceptions, such as nuts and grains (which must still be properly handled and stored), raw food stocks are generally highly perishable and require some type of processing in order to retain their edibility and availability for a period after harvest. Because of the seasonal nature of horticultural produce, processing is also undertaken to preserve food for periods when it is out of season. Processing horticultural produce into canned, frozen, preserves, dried, pasteurized and refrigerated products extends the period in which they can be made available to consumers. The public also has an interest in maintaining the quality of food and ensuring food safety since raw food deteriorates rapidly.

Most fruits (not berries) and vegetables are cleaned, graded, and stored before they are eaten. Agricultural products, in general, are perishable and available as fresh product only for a short period of time.

The relatively short 'shelf-life' (and perishable nature) of many foods requires a rapid turnover of products along the supply chain (i.e. from producer to consumer). The bulk of dairy products are chilled and processed as a matter of course. For example, pasteurizing, cheese making and yogurt production transform milks and cream into less perishable foods.

The first receivers of meat products are slaughter houses and processing plants, where the product can be handled quickly, hygienically, and the potential for food contamination minimized. Meat products are packed as chilled, frozen, smoked, dried, and cooked products prior to distribution to retail and foodservice outlets. As most households do not have the ability to store quantities of fresh meat and fish products for periods of time, there is only a limited market for farmer-to-consumer fresh meat sales.

Table 16 summarizes horticultural production in the Lower Mainland. In 2004, only 4.5% of horticultural produce produced in the Lower Mainland was sold by growers in raw form directly to end consumers. However, for some crops such as potatoes, up to 10% of the crop is sold at roadside stands and farmer's markets.[69] The Fraser Valley Farm Direct Marketing Association[70] represents one of the largest associations, over 70 members, in the Lower Mainland that make direct farm sales to consumers in the Lower Mainland.

About 69% was shipped fresh into wholesale channels, where it was, at a minimum, graded and packaged for distribution.

Direct sale by primary producers to the hotels, restaurants and institutional (HRI) sector is not common because it is difficult for small suppliers to tailor their products and production to the specific needs of these customers.

[69] http://www.agf.gov.bc.ca/potatoes/publications/documents/potatoe_profile.pdf
[70] http://www.bcfarmfresh.com/

Table 16: Horticultural Production in the BC Lower Mainland, by Fresh Sales Channel, 2004

Type of Horticultural Production	Fresh Sales Channel ('000 lbs)			Total Sales by Quantity
	Wholesale	Farm & Roadside[71]	Processing	
Field vegetables	146,903	27,892	54,855	229,650
Greenhouse vegetables	219,043	0		219,043
Mushrooms	58,059	0		58,059
Seed potatoes	30,259	0		30,259
Organic potatoes	5,224	0		5,224
Tree fruits	0	479		479
Berries & nuts	40,383	3,872	137,488	181,743
Total Quantity	499,871	32,243	192,343	724,457
Percent	69.0%	4.5%	26.5%	100%

Source: BC Horticulture Statistics. http://www.agf.gov.bc.ca/stats/2004HortStats.pdf

A very small proportion of meat, eggs and dairy products is marketed directly by producers to end consumers. The vast bulk of these products are sent to egg grading plants, milk plants, and slaughterhouses so they can be transformed into products suitable for distribution to end user markets. Recent changes to the Meat Inspection Act in the wake of BSE incidents make it mandatory for on-farm slaughter facilities to meet more stringent provincial processor standards, with the result that farm-based sales of meat products has largely been curtailed throughout BC.

Table 17 presents a breakout of the proportion, by value, of raw food products produced in BC. Sea, aquaculture, and agricultural products are shown to depict the proportions of total production represented by each category, with land-based agricultural product sales accounting for 72% of the total. It is also noted that commercial growers/producers and fishers retain some of their production/harvest for own use. In 2006/7, about 6.5% of the value of primary agriculture and fisheries products was consumed by this group, leaving 93.5% that is sold into the food system.

Table 17: BC Food Sales Value at the Primary Production Level, 2006 and 2007

BC Agriculture and Fish Production	Sales at Primary Level	
	Million $	Percent
Primary Agriculture	2,308 (1)	71.5%
Aquaculture	387.9 (2)	12.0%
Open Water Fishery	321 (2)	9,9%
Produced for own consumption	210 (1)	6.5%
Total	3,226.9	100.0%

Source: BC Ministry of Agriculture, Aquaculture and Food. 2007. Fast Stats
Notes: (1) 2006 – Statistics Canada.. Agriculture Census, Farm Gross Receipts excluding forest products. http://www.statcan.gc.ca/ca-ra2006/index-eng.htm
(2) 2007 – BC Ministry of Environment. Seafood Processing. Quick Facts. http://www.env.gov.bc.ca/omfd/fishstats/proc/index.html

[71] Recently, several growers make direct farm gate sales.

PROCESSORS

As the primary first receivers of raw BC agricultural and fisheries products, processors can be broken into 2 main groups:

- Primary processors; those who are first receivers of raw food who slaughter, wash, chill, freeze, grade, cut, trim, package, and
- Further-processors; those who add additional value to produce and meats, by transforming them into ready-to-eat or cooked food products.

In 2006-2007, BC generated domestic agriculture and fishery food processing sales of $6.6 billion and, in total, there are an estimated 1,477 food and non-alcoholic beverage manufacturing establishments (1,194 food and 283 beverage).[72] Approximately 55% of these food processing companies are located in the Lower Mainland. These companies are also predominantly small to medium-sized with the ability to be flexible in their production lines and supply specialty markets.[73]

Primary Processors

The largest primary processors in BC are found in the meat, milk and egg sectors. Poultry, milk and eggs are under supply management regimes, with associated border tariffs that limit the imported quantities of these food products from entering BC. As such, local product is sold in large and small, retail and HRI markets. Sales into the retail market are often direct to retail so as to eliminate middlemen, as the practice of discounting these products is often used to entice customers into supermarkets and grocery stores and margins are correspondingly small.

There is only small scale red meat processing in the Lower Mainland owing to the low number of feedlots and the need to import feed from the prairies. Most beef enterprises are low intensity cow-calf operations intended to make use of pasture land. Many beef cattle are also dairy-beef crosses in the Lower Mainland. There are 4 provincially licensed small scale red meat abattoirs in the Lower Mainland. BC produced meat, if available, is found in smaller BC based supermarkets. Small independent grocery stores and local butchers may carry locally grown meats. Locally produced organic options are more likely to be found at farmers markets and on-farm stores through farm direct sales. Meat processed in a provincially licensed processing facility can only be sold within the province. Meat intended for export out of BC is required to be inspected in a federally licensed processing facility, of which there is one doing custom work in the Lower Mainland.[74]

[72] BC Ministry of Agriculture, Aquaculture and Food. 2007. Fast Facts.
[73] Agriculture and Agri-Food Canada uses the following definitions: small – less than 50 employees; medium – 50 to 199 employees; and large – more than 200 employees. http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1205852178020&lang=eng. However, the Small Scale Food Processors Association of BC restricts its processor membership to those with no more than 25 full-time equivalent (fte) employees (supporter members may be larger). http://www.ssfpa.net/pages/membership.htm.
[74] (http://www.bcfpa.ca/guideBook/guide_Abattoirslist.html)

In the horticultural sector, BC primary processors of field vegetables are predominantly wholesalers to the retail sector during those seasons when local produce is available. Larger retailers tend to deal with larger suppliers with consistent quality, sufficient volume, and with year –round supply at the most competitive prices. This practice tends to place BC production into direct competition with imported produce in the main retail chains. Nevertheless, large retail chains are responding to public demand for locally produced and processed food products by procuring more produce locally, when it is available.

BC primary processors of berries (e.g. raspberries, blueberries, cranberries) in the Lower Mainland send a substantial portion of their product into the fresh export market and for further processing in the US. Overall, about 75% of the BC berry crop is currently processed.

Table 18: Disposition of Lower Mainland Berry Production into Fresh and Processed Markets

Berry Crop	Estimated Production (Tonnes)	Fresh Sales	Primary Processed	Number of BC Processors	Percent Exported
Blueberries	33,000	50%	50%	13	~50%
Raspberries	14,000	3%	97%	17	~75%
Cranberries	34,000	<1%	99%	2	90%
Strawberries	3,000	30%	70%	Not available	0%
Totals/ Average	84,000	24.3%	76.7%		

Sources: BC industry associations websites;
BC Cranberry Industry Backgrounder.
http://www.farmwest.com/index.cfm?method=pages.showPage&pageid=533 ;
Wahl, TI. Competing in global markets: Implications for the Washington raspberry industry. Washington State University.
http://www.impact.wsu.edu/presentations/pdf/Global_Markets_Implications_for_PNW_Raspberry_Industry.pdf

Further Processors

Whereas primary food processing is the process of transforming raw ingredients into food, further processing refers to the additional processing to prepare ready-to-eat food products from primary processed products. Early further processing products consisted of fermenting, preserving with salt, cooking, and canning. Further processed products of today may include may other ingredients in addition to the original raw food products.

In BC and Canada, poultry, dairy and egg production is regulated under supply management systems, and the quantities produced are determined by the size of the provincial markets in which they are produced. Quota allocations determine product flows, and regulations prevent the international import of raw products.[75] Formulas are in place governing the prices that primary processors pay farmers for raw product. The prices paid by processors for raw product are negotiated with supply management agencies. Prices are determined by formulae that provide a return to the grower and processor. A key feature of the supply management system is that it is designed to balance domestic production and demand, and exporting is essentially a surplus removal mechanism. In general, producer prices and costs of processing are higher than the lowest international procurement prices for raw products or components.

Supply management systems do not control the importation of further processed products made from regulated commodities. Large international further processors, prominent players in the market, rely on lowest ingredient pricing and massive scales of facilities in order to secure and maintain markets. BC further processors, faced with domestic pricing, have developed small market niches for speciality products that do not compete directly with imports from elsewhere. As such, BC further processors of poultry, dairy and eggs are small and few compared to companies in those jurisdictions where supply and base pricing is unregulated.

Further processing of unregulated red meats (beef, pork, lamb) occurs in the Lower Mainland for niche markets. There are many smaller meat shops in the Lower Mainland making and marketing value –added meat specialties. In Vancouver alone, 131 corner meat shops were found in a single internet search request. Some of these are small chains of 3 to 7 stores. These outlets purchase local and imported raw meats for processing. Although the Lower Mainland population is substantial, it is not large enough to support the scale of further processors that can successfully compete in mainstream international markets.

Further processing of BC horticultural products tends to be dominated by small firms preparing niche products. Two intermediately sized horticultural processors in the Lower Mainland (Snowcrest Packers and Clearbrook Frozen Fruit and Vegetables (Lucerne)) process about 24% of the field vegetables grown in the Lower Mainland and are affiliated with international processors. BC Frozen Foods, Mission, BC, is an example of a smaller independent food processor that has developed a frozen processed food market to retail and foodservice sectors locally, nationally and internationally, based on the procurement of produce from local growers. The production and marketing of a number of root and field vegetables for the processing market in the Lower Mainland is regulated by the BC Vegetable Marketing Commission.

[75] A small proportion of supply may be imported when provincial supply and demand is temporarily out of balance, and under grandfathering provisions to processors established when supply management system was established.

Much of the berry production (e.g., raspberries, blueberries, cranberries) ends up being primary processed in the Lower Mainland and then shipped to US locations for further processing, after which it may show up in local markets. Processing strawberry is a regulated product in the Lower Mainland, implying that production is controlled to be in line with demand from processors.

In summary, further processors in the Lower Mainland compete with international further processors in the domestic market. Smaller scale of BC processing plants and higher per unit production costs have placed serious constraints on the economic viability of local further processing and created a reliance on trade for these products. A future area deserving investigation is an assessment of the extent to which more local food production could be channelled into local further processing and the reciprocal impact on the potential for improved viability of local food producers.

WHOLESALERS

The role of wholesalers is to buy products directly from producers, packers, processors, shippers and importers and to re-sell to retailers. In the Lower Mainland, wholesalers are predominant between processors and retailers. The large retailers, such as Overwaitea Group, Canada Safeway, Thrifty's Foods, and IGA Marketplace also have their own wholesale divisions. In the horticultural sector, about 69% of Lower Mainland production passes through wholesalers. However, the bulk of fresh produce consumed in the Lower Mainland is provided by large wholesalers accessing produce from growers in California, Florida, Mexico and off-shore.

In the Lower Mainland, regulated field vegetables are marketed through one designated agency cooperative owned by BC Growers, BC Fresh Vegetables Inc.(BC Fresh), and 28 registered wholesalers.[76]There is also one designated marketing agency for certified organic potatoes in the Lower Mainland, Fraserland Organics Inc.

BC wholesalers play only a small role in the processor-to-HRI food product supply chain, mainly because they are not large enough to procure for the few, large, foodservice distributors. It is reported that wholesaler sales direct to restaurants is generally less than 5% and frequently less that 1% to 2% of gross sales[77] and wholesalers are generally not involved in sales to foodservice distributors.

Small wholesalers, known as jobbers, purchase products from larger wholesalers and re-sell to smaller retailers and restaurants.

In the BC supply managed meat, milk and table egg sectors, processors handle the distribution of product to large retailers and essentially are

[76] http://www.bcveg.com/WholesalersSept%202007.pdf
[77] See BCMAL. 2006. Guidelines for BC producers and processors selling to foodservice distributors. 2006. April. http://www.bcfarmersmarket.org/ind/pdf/fsd_manual.pdf

wholesalers. This situation is influenced by the fact that several large retailers have their own milk processing and meat processing divisions, as a result of mergers, buyouts, and consolidations in the international agricultural industry.

In the regulated greenhouse vegetable sector, there are 5 BC marketing agencies in the Lower Mainland wholesaling greenhouse vegetables. Over 80% of the greenhouse vegetable crop is destined for the US market. Large international distributors, such as the Oppenheimer Group, are also involved in directing the Lower Mainland conventional and organic greenhouse vegetable production to North American retail chains and have the additional advantage of being able to simultaneously supply a variety of different fruits and vegetables. Village Farms Canada Inc., with about 40% of BC greenhouse vegetable production, also has operations in the US and Mexico marketing and distributing to the North American market and Japan on a year-round basis.

Access by BC wholesalers to the food distribution system is primarily restricted by: the small scale of local supply; seasonality of production; higher per unit pricing; and limited presence of supporting infrastructure (such as processing), also due to limited scale and fragmentation in the production sector. However, full cost accounting of food distribution systems could be instructive in this area and may reveal that local food production and processing solutions are not "expensive" when all "costs" are included in the assessment. This finding would contribute to the economic rationale for increased community food security.

FOOD SERVICE DISTRIBUTORS

Foodservice distributors (FSDs) are the primary intermediaries within the producer-to-hotel/restaurant/institution (HRI) supply chain. FSDs tend to procure their food inputs from large growers/processors/fishers and to a secondary extent from wholesalers and most secondary processors.

It is reported that the HRI sector, which represents about 40% of food product sales, purchases about 90% of its food supplies from FSDs.[78] The same report estimates that Gordon Food Service (Neptune Food Service) and Sysco Food Services and probably control about 60% to 65% of the foodservice market.

Sysco and Gordon are primary suppliers to large restaurant and hotel chains, offering "multi-line" or "one-stop-shop" services. There is an industry practice and culture of sourcing most of its agricultural food product supplies outside of the province and outside of Canada (e.g., California, Mexico, off-shore). This is apparently not the case with regard to seafood.[79]

[78] See BCMAL. 2006. Guidelines for BC producers and processors selling to foodservice distributors. 2006. April. http://www.bcfarmersmarket.org/ind/pdf/fsd_manual.pdf
[79] Ibid.

Larger FSDs also focus to a greater extent on frozen and dry products, as opposed to fresh products, for ease of handling and maintaining product quality. Food products offered by FSDs are higher value than other wholesaler products because of lower order quantities, more specialty items and the addition of higher value added operations, such as product deconsolidation, packaging, sorting, storing, inventorying, peeling, and slicing.

BC food products probably account for less than one-third of the ingredients sold by the large FSDs. Nevertheless, it should be noted that Neptune in 2008, for example, hired a new BC Products Category Manager to purchase fresh, local products in response to consumer trends at restaurants toward buying local. Similarly, Sysco has responded to consumer demand for more local and sustainably produced foods through a local food system initiative called "Buy Local, Sell Fresh".

International companies, such as Aramark and Compass Group Canada, offer professional services in event planning and facilities management that include food services focused on the institutional market of HRI, such as conference centres, resorts, health care institutions, universities and school districts, stadiums and arenas. The food products provided in these venues are sourced internationally from suppliers that can provide the consistency of quality, adequate volume, and year-round supply at the most competitive price. It is likely that a very small proportion of the food products used by this segment is sourced from BC producers. The dominant characteristics of food sold in these markets are higher order quantities and lower price points.[80]

There are a significant number of smaller FSDs servicing smaller entities in the hotel and restaurant sectors as well as the small independent corner markets. These FSDs typically service regional foodservice markets with lengthy distribution chains and relatively lower volumes, may carry single or a few food product lines, and focus on specialty products, including local and fresh products that are not convenient for larger FSDs to handle. A small number of highly specialized suppliers service high end restaurants, where quality and unique food characteristics obtain premium pricing.

The ability of local food producers to gain and retain access to foodservice distributors faces many of the same challenges as are experienced in the wholesaler sector. These challenges include: reliable supply of consistent high quality; short seasonal availability; specializing production for quality as opposed to harvest quantity (e.g., baby versions of fruit vegetables); limitations associated with being single vs multi-product line suppliers; and higher farm gate pricing. Nevertheless, it would be useful to assess if local produce can be staged to sustain consumer and HRI interest and extract premiums in the local HRI marketplace. In this respect, seasonality and novelty may be marketable as positive attributes to consumers wishing

[80] See BCMAL. 2006. Guidelines for BC producers and processors selling to foodservice distributors. 2006. April. http://www.bcfarmersmarket.org/ind/pdf/fsd_manual.pdf

to be in tune with local growing seasons and unique local product specializations.

FOOD RETAILERS

Grocers

Grocer retailers account for about 60% of the value of food products sales in BC.

The retail food sector in the Lower Mainland is dominated by 7 larger supermarket chains: Canada Safeway, The Overwaitea Group, IGA Marketplace (HY Louie Co. Ltd.), Westfair Foods, Whole Foods, Thrifty's Foods, and Choices. Others include Dan-D Market company.

In addition, there are food warehouse club stores (Costco), and numerous Seven Eleven and Mac's convenience stores. The convenience chains are serviced by the large foodservice distributors.

A number of specialty retail superstores are also present in the Lower Mainland, servicing the demand for ethnic food choices. Major food retailers are indicated in Table 19, below.

As well, numerous corner grocers, bakeries and markets are located in Vancouver. There are at least 940 of these generally small, multi-ethnic independents.[81] These establishments rely to a great extent on foodservice distributors for products. Local growers in Richmond and Burnaby, for example, supply specialty products in many small ethnic retail outlets.

Most supermarket chains will feature locally grown food production when it is available. In most cases, both conventional and organic BC products compete for market share along-side imported products in the BC harvest season. As a result, price point is often influenced and essentially determined by imports unless the products are unique (e.g., organic heirloom tomatoes).

[81] http://foodpages.ca/BC/VANCOUVER/citylist/all

Table 19: Lower Mainland Food Retail Outlets

Outlet	Outlets in BC	Outlets in Lower Mainland	Outlets in Vancouver	Comment
Overwaitea Food Group	16 Overwaitea 50 Save-on-Foods 9 PriceSmart 2 Urban Fare 1 Bulkley Valley Wholesale 24 Buy-Low, Nester's, Associated Grocers Foods, Shop 'N Save, Budget Foods 13 Copper's	~75 stores	6 outlets	SOM points can be donated to charity. Participates in the School Fruit and Vegetable nutrition program.
Canada Safeway	77 outlets	~45 stores	12 outlets	
Westfair Foods	25 Loblaws Superstore, Real Canadian Superstore	4 outlets	3 outlets	
Thrifty's Foods	21 outlets	3 outlets		
HY Louie	47 IGA Marketplace, Cash 'N Carry	47 outlets	14 outlets	Food Bank Banking on Good Will program
Choices markets	10 outlets	9 outlets	4 outlets	
Wal-Mart	10 outlets	4 outlets		
Whole Foods	4 Capers Community Markets	4 outlets	3 outlets	
Mac's convenience	48 outlets	35 outlets		
Seven Eleven	89 outlets	69 outlets		
Yaohan		1 outlet		Japanese supermarket
Osaka		1 outlet		Japanese supermarket
T&T		8 outlets		Taiwanese & Chinese supermarket
Han Ah Reum/H-Mart		2 outlets	1 outlet	Korean supermarket
Costco	12 outlets	7 outlets	1 outlet	
Stong's			1 outlet	School program- 4% rebate to parents/faculty of schools
Corner grocers and markets, delis, bakeries			~940 stores	

RESTAURANTS

There are at least 3,773 restaurant locations in Vancouver, representing an estimated 45% of the restaurants in BC. This figure includes restaurants, caterers, and take-out vendors but does not include accommodation, recreational or institutional outlets.

In 2005, 75% of Canadians ate meals prepared from their homes (see Table 20), meaning that 17% was purchased in restaurants, fast-food outlets or home meal replacement outlets and 8% skipped meals. The BC data indicates that the average BC household spends about 32.7% on food purchased from restaurants, or significantly above the national average.[82]

[82] Statistics Canada. Average weekly food expenditure per household, 2001. http://www40.statcan.ca/l01/cst01/famil27b.htm

Connections are being developed by local restaurant chefs and local food producers to feature local produce in menu offerings. These connections are promoted at annual galas such as Taste of Agassiz, where local food is showcased in a "Gourmet Event of the Year" event, a food tasting evening featuring original local food recipes of participating chefs.[83] Similarly, "Eat BC" is a joint initiative by the BC Agriculture Council and the BC Restaurant & Foodservices Association to prefer BC food and beverages at grocery stores, farmers' markets and participating restaurants and to promote food options that support local growers and reduce consumer carbon-footprint.[84] Get Local is another community of BC food producers, businesses and supporting groups promoting local eating in the Metro Vancouver area, with a focus on educating consumers about the benefits of eating local food to increase the local supply and distribution opportunities.[85]

Table 20: Where Canadians Eat Meals

Meal Option	% of Meals
In-Home- At Retail	67
At a Restaurant	8
Skipped Meals	8
Carried From Home	8
All Other Away-From-Home	7
In Home – From Restaurants	2
In Home – Home Meal Replacement	1

Source: Canadian Restaurant and Foodservice Association. In Eating Patterns in Canada Report 2005, NPD Group Canada Inc.
Extracted from: **http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1205781159471&lang=e**

Organic Food Distribution System

Organic Producers

It is reported that organics in Canada is the fastest growing sector in agriculture with sales increasing 20% per year.[86] In BC, organic farmers represent about 2.8% of the farmer population. The Lower Mainland has a wide variety of organic enterprises. There is a strong growth trend in organic transition and certification as growers differentiate their products in the mainstream marketplace.[87] In 2008, BC organic transition and new growers were strongly supportive of the assistance provided by a government sponsored COABC extension agent to improve adoption success of organic farming practices.[88]

[83] http://www.hautespotsvancouver.com/vancouver-events.php?eid=325
[84] See http://www.eatbc.com/about
[85] See http://www.getlocalbc.org/en/what.php
[86] Canadian Organic Growers. Quick Fact on Organics in Canada. http://www.cog.ca/orgquickfacts.htm
[87] See COABC. 2005. BC Organic Statistics. http://www.certifiedorganic.bc.ca/pdf/StatsBC2005.pdf
[88] Canadian Organic Association of BC. 2008 Extension Survey Report. http://www.certifiedorganic.bc.ca/contact/extension/Extension_08_summary.pdf

Organic field production and all conventionally grown produce takes place throughout the Lower Mainland. Several large commercial organic vegetable farms are located in the Delta area. Many direct sellers of local produce have differentiated their products by adopting organic growing practices.

Local organic products are also entering the marketplace in the livestock sectors. Organic meat products are produced in most unregulated animal sectors, including beef, sheep, pigs, bison, and deer.[89] Organic milk production from dairy cows, goats and sheep is available in Lower Mainland supermarkets from some 20 producers located throughout BC.

In the cases of dairy, broilers, eggs and turkeys, BC supply managed marketing systems have been modified to better accommodate organic production; not a smooth transition. Regulatory reviews have been undertaken to support increased specialty production and new entrants within the supply managed systems.[90]

One of the Lower Mainland's largest organic sectors, from a production perspective, is the greenhouse vegetable sector. South Alder Greenhouses has been producing organic tomatoes and peppers, which are marketed into the US by The Oppenheimer Group, based out of Vancouver. In 2008, GBE Industries started producing heirloom organic tomatoes for the domestic market, selling to organic distributors, smaller retail chains, restaurants, and in farmers markets. Nevertheless, the economic sustainability of greenhouse organic production is strongly influenced by per unit energy costs and the continued ability and willingness of consumers to pay higher per unit costs, relative to conventionally grown, for organic products.

An additional conundrum faced by organic growers wishing to achieve economies of scale, (e.g. greenhouse vegetable, herbs) is that increasing production may saturate more sophisticated local target markets, forcing sales into areas/regions where the qualities of the produce are not appreciated, or where customers are less willing to be pay for them.

Community Supported Agriculture[91] initiatives (CSAs), which tend to be organic operations in other jurisdictions, are in their infancy in BC.[92]

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[89] BC Ministry of Agriculture and Lands. Organic animal production in BC. http://www.agf.gov.bc.ca/organics/organics_industry/section7.pdf

[90] BC Farm Industry Review Board. Review of specialty production and new entrant programs – Improving access to the supply management system. http://www.firb.gov.bc.ca/specialty_review.htm

[91] CSAs may be described as farming units that are dedicated to local producing for local markets that, in turn, are supported by local community consumers committing to the success of the enterprise through the provision of services, money, time, etc. See Henderson, E. and R. Van En. 2007. Sharing the harvest: A citizen's guide to community supported agriculture. Chelsea Green Publishing Company. White River Junction, Vermont, USA.

[92] CSA farms in the Lower Mainland are limited to UBC Farm, going into its 4th year operation in 2009. Sudoa Farm, Mission, BC, used to market most of its produce in the Vancouver Farmers' Market and to CSA subscribers.

Nevertheless, the small size of many BC agricultural holdings, opportunities for local markets due to population densification, suggests that significant potential exists for these community based agricultural production, marketing and distribution models.

Organic Markets

Specific data on the size or characteristics of the BC organic market is not available. It is estimated that the farm gate value of BC organic production was $29.1 million in 2005, which includes some level of on-farm primary processing. [93] This total, however, is dwarfed by the total sales of organic products in BC.

Fresh vegetables account for 25% of all supermarket organic food sales in Canada. Retail channels for BC organic food products are limited by the small volumes produced and the many producers supplying the market. As such, BC sales are predominantly in on-farm markets, farmers markets and specialty stores.

The large international foodservice distributors operating in BC, while depending primarily on imported products, are starting to utilize local organic produce as consumers begin to demand it in restaurants. There is also considerable opportunity for small BC-based foodservice companies to service the independent upscale food outlets in the province with locally grown organic fresh and processed products.

The current potential for BC organic products to enter the further processed markets is constrained by absence of product (most of which is already receiving a premium as fresh).

Organic Distributors

Organic retail distribution ranges from direct to consumer sales to sales by grocery store chains and mass merchandisers. Large retailers are generally accessing raw material from large organic suppliers in the US, Mexico and off-shore. The small size of Canadian organic producers makes it extremely difficult to supply these large retailers with ample quantity year-round.

The distribution of certified organic food in the larger conventional retail chains in the Lower Mainland mirrors the distribution system for conventional food. Large grocery retailers procure organic products from large suppliers that can provide uniform quality, adequate volume and year-round supply at competitive prices.

Nonetheless, there are organic food distributors in BC, largely focusing on specialty markets not serviced by large retail distributors, many of which are in-house divisions of grocery chains. Sun-Opta (Pro-Organics) is the largest organic distributor with operations that include off-shore sourcing

[93] See BC Ministry of Agriculture, Aquaculture and Food. 2006. Summary of the BC Organic Industry. http://www.agf.gov.bc.ca/organics/organics_industry/organics_overview.htm

and organic food ingredient manufacture. Other smaller organic produce distributors in BC include Discovery Organics and Horizon Distributors.

Small Potatoes Urban Delivery (SPUD)[94], servicing the Lower Mainland, Greater Victoria, and parts of Vancouver Island, is an example of an organic distribution model that sources from local farmers and food processors, mostly organic, and carries out home delivery directly to consumers that order on a 48 hour lead time basis. SPUD has a goal of becoming a carbon neutral food distributor by reducing their carbon footprint and purchasing carbon offsets.

Biovia Organic Link Ltd. sources a network of over 40 independent producers and artisans in providing truck delivery of pre-ordered organic products to restaurants in Vancouver.[95]

Several organic growers market their locally grown organic and natural produce and meats direct-to- restaurants. Product variety, reliable quality and supply, and seasonality of production are issues for independent suppliers. Where meat is concerned, on-farm processing facilities are required to meet higher standards of food safety, imposed on the agricultural industry to protect public health arising from the food safety risk created by recent disease outbreaks in the livestock sectors. Some of these requirements are especially financially onerous on small scale organic suppliers. Among produce growers, more emphasis is needed on the proper handling and transportation of products from the farm to the staging point (distributor's warehouse).

Currently, about 90% of the organic food consumption in Canada is imported, originating from the US, Mexico and off-shore (e.g., Latin America). Fresh fruit and vegetables is the largest market segment, followed by dairy, breads and grains, packaged or prepared foods, and beverages. The local organic distribution network is comparatively inefficient compared to international organic procurement networks and using current measuring sticks. However, full cost accounting of imported organic food procurement systems may reveal that local distributors have competitive advantages in un-priced services provided to consumers free of charge (e.g., smaller carbon footprint, less environmental impact).

Organic Processing

Organic processors tend to produce the organic versions of products sold in conventional markets. Some products are also being further differentiated by incorporating exotic tastes and combinations of flavours.

BC and Quebec recorded the largest increases in the number of certified organic processors and handlers in Canada between 2004 and 2005, with an increase of 47%.[96] In 2006, there were 46 certified organic processors

[94] See https://www.spud.ca/index.cfm
[95] See http://www.getlocalbc.org/en/biovia.php
[96] Canadian Organic Growers. Quick Fact on Organics in Canada. http://www.cog.ca/orgquickfacts.htm

and handlers of organic products in the Lower Mainland.[97] Some conventional processing facilities also process organic products, e.g., Olympic Dairy Products, Ltd. in Delta.

However, certified processors and handlers in BC do not necessarily procure from BC producers. Several organic processors in the Vancouver area process products not available in the Lower Mainland, such as chocolate, cereal grains, coffee and tea. The current potential for BC organic products to enter processed markets is constrained by absence of product and the scale of production that would be required to support organic production.

In addition to underlying issues of scale and seasonality of production, the local organic processing is often a value-added extension of local organic production enterprises. This sector tends to be under-capitalized, possess inadequate processing knowledge, and relatively higher marketing and distribution costs.

Grocery Retail

Organic retailers, such as Whole Foods (Capers Community Markets), make an effort to procure local organic food products through distributors such as Discovery Organics and Pro-Organics (Sun-Opta) and organic food delivery (e.g., SPUD). Thrifty's Foods has announced a commitment to 50% organic in its produce department by 2010, of which 30% was sourced from BC in 2004.[98]

There are 36 certified organic retail stores in the Lower Mainland, of which 22 are located in Vancouver.[99] These stores cover the spectrum from high end retailers (e.g., Choices) to cooperatives (e.g., East End Coop).

There are smaller organic on-farm retail stores sprinkled throughout the Lower Mainland.

Hotel/Restaurant and Institutional Markets

More organic products are being distributed into the restaurant sector, as consumers demand the product. The procurement practices of the large FSDs are heavily weighted to international supply of organic products and these large FSDs transact with the bulk of the large restaurant chains. Local organic growers are making inroads into the local restaurant trade where chefs are demanding fresh local organic production. Quality and consistency of supply are issues.

[97] Some examples are Anita's Organic Grain and Flour Mill, Chilliwack; Biovia Organic Link Ltd., Vancouver; Naturally Homegrown Foods Ltd., Maple Ridge; and Goat's Pride Organic Goat Products, Abbotsford.
[98] See MacNair, E. 2004. A Baseline Assessment of Food Security in BC's Capital Region. A report prepared for the Capital Region Food and Agricultural Initiatives Roundtable. http://www.communitycouncil.ca/pdf/CR-FAIR_FS_20Assessment_web.pdf
[99] See http://www.pawsbc.com/organicstores.html

The processing of BC organic products into value-added food products is also occurring in niche markets. Organic milk products (Avalon) baby food, organic oils, cheeses, and berry products are being manufactured locally and finding local and export markets.

There is indication that organic products are entering the institutional food sector in fresh form. It is unlikely that BC producers are participating in that market, given the large volumes of products required and the small scale of BC operations.

Other Distribution Networks

Alternative food distribution networks operating in Vancouver consist of community markets, food box programs, food cooperatives, and meal delivery services. The potential capacity of these food networks to provide improved community food security is unknown, as their presence is yet to be fully established or impact evaluated.

The networks share common characteristics:

- They are planned to be financially sustaining from the perspective of providing food to the marketplace
- There is an emphasis on procuring locally produced food
- They promote less food waste and more economical food access
- Goals include reducing and localizing food distribution costs.

Community Markets

Vancouver Farmers Markets (Your Local Farmers Market Society) hosts 4 farmers markets each summer and 2 winter holiday markets. [100] The summer markets are located at sites in East Vancouver, the West End, Riley Park, and Kitsilano. The goal of the Society is to spread awareness of agricultural issues to promoting fair pricing for agricultural products and a locally-networked food system.

The BC Association of Farmers Markets has numerous markets in the Lower Mainland. In 2008, Richmond introduced the pocket market concept, which is a smaller market intended to serve a neighbourhood or community.[101]

Farmers Markets are used by many small scale organic producers scattered throughout the Lower Mainland to reach consumers. Most municipalities in the Lower Mainland provide Farmers Markets in-season venues for the sale of local produce. Travelling "local" suppliers move from market to market and the product offered is may not be from the municipality in which the market is held.

[100] Vancouver Farmers Markets. http://www.eatlocal.org/markets.html
[101] See http//www.foodroot.ca/pmtoolkits1.htm

Some organic growers lease stalls in the Granville Island/False Creek Organic Acres Market, which has developed a reputation as a good, but expensive, source of a wide range of locally grown and imported food.

Buying Clubs

Neighbours Organic Weekly Buying Club (NOWBC)[102] is a cooperative that provides delivery of organic foods in Metro Vancouver, focussing on procuring as much as possible from local farms and processors. Members place orders from a food catalogue on a weekly basis. These orders are picked up by the members at designated depots in the area.

The East End Food Cooperative[103] is a consumer-owned grocery business operated to provide accessible nutrition and local foods. The store is run by paid staff, who endeavour to create savings by buying in bulk and passing the savings on to their members.

The Partners in Hope Recovery Society is a cooperative composed of members who pool their resource to purchase food in bulk and have it delivered in individual meal portions. The coop is run by a coordinator with volunteer staff and is oriented towards members on income assistance, pensioners, someone entering the work force at a part-time salary with limited income, or someone experiencing financial hardship.

Meal Delivery Services

The concept of selling meals prepared from local foods is the marketing approach used by Sliced Tomatoes, a meal delivery service operating in Vancouver and some adjacent municipalities.[104] The company operates an ordering service that caters to homes or offices and claims to be the only ready-to-cook meal provider in Vancouver.

Food Charity Networks

Food charities may not be considered as not part of a functioning food distribution network, but rather evidence of failure of the current food system to effectively distribute food to all members of society. This report does not broach this question. Nevertheless, food charities exist, they re-distribute food in the community, and their presence is reported here for completeness.

The Greater Vancouver Food Bank Society[105], in operation since 1982, provides food for about 25,000 people weekly through its own 15 depots located in Metro Vancouver and through donations to other food charity agencies (of which there are at least 100 operating in Vancouver). Various outreach programs are also operated to create and promote better food alternatives, including Kid's Picks, Basics for Babies, Fresh Choices Community Kitchens, and Community Angel Food Runners. Food

[102] NOWBC. See http://www.nowbc.ca/
[103] East End Food Coop. See http://www.east-end-food.coop/index.html
[104] See Sliced Tomatoes. http://slicedtomatoes.ca/
[105] Greater Vancouver Food Bank. See http://www.foodbank.bc.ca/main/?home

donations are obtained from grocers, restaurants, cafeterias, schools, food brokers, warehouses, transportation companies, government food inspection branches. Perishable items are also purchased for distribution. About 8 million lbs (3,636 tonnes) is distributed annually. The Society relies entirely on corporate sponsors, donors, and fundraisers to meet operating requirements.

The Quest Outreach Society[106], a not-for-profit organization, intercepts non-marketable food from the food industry before it is diverted to landfills. Quest Food Exchange prepares hot sit-down meals in their own kitchen, delivers raw food materials to social service agencies, and provides food through food banks and emergency hampers. Quest claims provide food assistance to more than 244 social service agencies feeding 70,000 people per month in the Lower Mainland. In 2006/2007, Quest reported that it redirected 5.77 million pounds (2,623 tonnes) of fresh vegetables and fruit, meat and fish, baked goods and other staples to homeless and street people in Vancouver's Downtown Eastside. Food is donated by over 15 food companies located in the Lower Mainland.[107] Quest is funded by donations and a revenue-based model for food rescue and redistribution, which is currently being expanded into Vancouver Island and the Interior. Quest has recently opened a low-cost grocery store in Surrey, BC, with a range of produce, dairy meat, pasta, canned goods, snacks and drinks.

Critics dispute that much of what such networks distribute is not actually "food", in the sense of providing nutritious and wholesome food choices (e.g., snacks, donuts, coffee).

Other Food System Initiatives In BC

These BC initiatives fall under the rubric of community-based actions to promote local food benefits. As with alternative food networks, above, food system initiatives are rapidly evolving as momentum increases, new ideas emerge, and as the linkages between local food and participants in the food supply chain through to consumers are multiplied and strengthened.

Buy BC

The buy BC program was launched in 1993 with the support of the provincial government and private industry. The buy BC logo is used by some 1,200 companies and associations to identify over 5,000 BC products in provincial retail groceries.[108] The program was developed in a response to consumer interest in seeing BC products differentiated in the marketplace and is paid for by participating members.

[106] http://www.questoutreach.org/page141.htm
[107] The donor list includes British Canadian Importers, BC Hothouse, Capers Community Market, Dan D Pak, Ecco il Pane, Emperor Specialty Foods, Falesca Importing Ltd., Happy Planet Foods, Horizon Distributors, Premium Brand Food Group, Que Pasa Mexican Foods, San Remo Food Importers, SPUD: Small Potatoes Urban Delivery, T&T Supermarket, Uprising Breads Bakery.
[108] See http://www.bcac.bc.ca/buybc/index.html

Eat BC

This initiative is a partnership between the BC Restaurant & Foodservices Association and the BC Agriculture Council to promote BC foods and beverages in local grocery stores and farmers markets.[109] A total of 136 businesses and restaurants participated in the program in 2008 and received increased exposure for developing sales relationships with BC food suppliers. Marketplace IGA signed onto the program in 2008. University of British Columbia (UBC), Simon Fraser University (SFU) and University of Victoria (UVIC) have enrolled at least one dining establishment each into the EatBC! dining promotion. Farmers' markets are participating in the program to achieve greater menu presence of local food in local restaurants. The program is also working with elementary and secondary schools in the province to increase uptake of BC foods. Financing of the initiative comes from BC Ministry of Agriculture and Lands, BC Investment Agriculture Foundation, and industry sponsorship/advertising.

Get Local

Get Local[110] is a community of BC food producers, businesses, and groups collaborating to promote eating locally in the Metro Vancouver. The organization is raising consciousness about local food, where and when it is available, and supports venues to bring growers, businesses, and consumers into contact to promote local food.

Green Table Network

This is a network of restaurants and foodservice outlets committed to local and organic foods, but who also are proponents of eco-efficiency, energy and water conservation, beneficial waste management and reducing their carbon footprint. The alliance supports a regionally focused agricultural food system and sustainable food community.[111]

Local Food First

This initiative is a collaborating effort between non-profit groups, educators, producers, distributors, retailers and restaurants in BC. Local Food First is supporting the development resilient communities by promoting capacity for increased food production for the local market in BC.[112]

[109] See Eat BC! Campaign Overview. May 2007- May 2008. http://www.eatbc.com/images/pages/about/2007_Annual_Report.pdf
[110] See http://www.getlocalbc.org/en/
[111] See http://greentable.net/home/
[112] See Jason Boyce, Program Coordinator. http://www.linkedin.com/in/jasonboyce

FOOD SECURITY TOOLS

The essential issue with respect to food security is to be able to identify programs, tools or system changes that can contribute to a more sustainable and secure food system in BC and more specifically in Vancouver. Essential to creating an effective response to food security is a solid understanding of the geo-political and socio-economic context in which food security is enhanced or jeopardized.

There are a range of programs and interventions that could be undertaken. In the review of the literature and background documents, a number of examples have been found that either are now being applied in other jurisdictions, or have been proposed.

For example, the Food System Assessment report[113] indicated a range of responses that could be made to improve the food security system. Some of those suggested include:

- organic production;
- working to expand agricultural production within the ALR;
- community and commercial kitchens;
- community gardens;
- roof top gardens, and urban agriculture;
- capacity building programs;
- cooperative stores;
- local food production, restrict imports;
- government and private infrastructure investment.

Not included on the above list are food banks and soup kitchens, which are indicators of a food insecure community, and indicative of proactive responses falling short.

The Waterloo food system plan[114] listed a number of programs and alternatives that similarly could improve food security.

- Increase social assistance, higher minimum wage, affordable housing.
- Changes in school curriculum to include food security issues.
- Establish educational programs to educate people on seasonal eating, nutrition.
- Land use and zoning changes.
- Increase availability of healthy food.
- Strengthen the food economy.
- Increase consumers food related knowledge and skills.
- Encourage local food processing.

[113] Ibid, Food System Assessment of the City of Vancouver.
[114] Ibid, A Healthy Community Food System Plan for Waterloo Region

This is not a complete list but gives a range of possibilities that could be applied in Vancouver. In the Vancouver Security Initiative section following in this report, a more complete overview of the food security programs in place in Vancouver is provided.

One challenge is to determine what actions can be selected, and how effective they may be in improving the food security of the community.

Table 21 provides a range of action possibilities that could be considered linked to the three key determinant areas of food security identified at the beginning of this report. Those determinants are:

- Affordability of food;
- Knowledge about food nutrition; and
- Sustainability to the food system.

Table 21: Suggested Food Security Actions

Food System Changes	*Farmers Markets*
	Proactive Agricultural Land Use Preservation Policies
	Organic/alternative Production Systems
	Self/Local Sufficiency
	Local Distribution Systems
	Local Processing Enterprises
	Traceability Systems
	Cooperative Local Stores
	Urban Agriculture
Enhanced Knowledge	*Nutrition Education*
	Urban Farm Schools
	Awareness of Food Alternatives
Affordability	*Urban Gardens*
	Community Kitchens
	Social Enterprise Programs

FOOD SECURITY INDICATORS

CONCEPTUAL OVERVIEW

Central to the development of a food secure system for Vancouver is the ability to identify indicators. Measurable food security indicators have four purposes:

- Establish Vancouver's current level of food security;
- Describe progress toward the achievement of the desired outcomes for food security system in Vancouver;
- Benchmark the food security position of Vancouver relative to other jurisdictions; and
- Provide feedback to improve current food security and develop better indicators

The establishment of indicators implies first that there is a clear understanding of what is meant by food security and what the desired outcomes of the system are. As has been proposed in this report,

> "***Food security is achieved when the structure and capacity of the food system can meet the food related human, cultural, economic, social and environmental needs of the individual and community."***

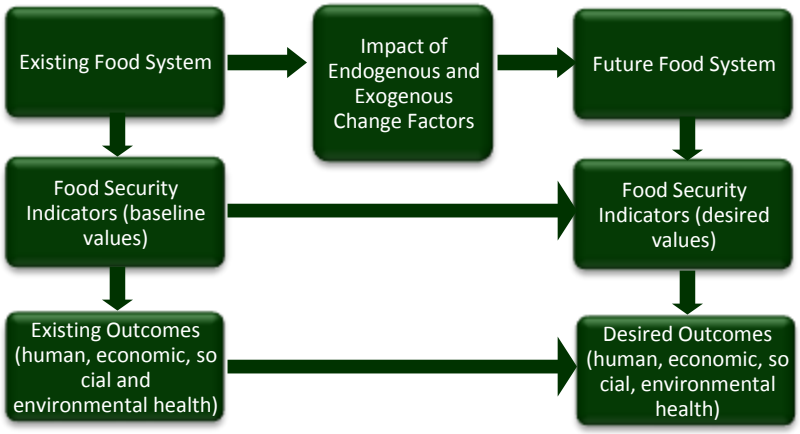
The outcomes of a food security system, given this definition and as was discussed previously, are measured in terms of the human, economic, social, and environmental health changes desired. Indicators need to be established to measure these outcomes, to benchmark where a region or community is with respect to these outcomes, and measure performance over time in achieving these outcomes.

Figure 12 summarizes the interrelationships within the existing food system, outcomes, and the role of food security indicators. The existing food system delivers a range of outcomes with respect to the economic, social, human, and environmental health of people. These outcomes have been discussed in at the beginning of this report "Defining Food Security", and Figure 1. The major challenge is to develop indicators that adequately measure these outcomes. A range of possible indicators are developed in the next section.

The food system over time can and will change due to the influence of both endogenous and exogenous factors and conditions. Endogenous change comes from ways in which the participants within the food system (producers, processors, distributors and marketers) evolve and develop their production and management practices. Exogenous change will come both from the impact of local and global trends and forces on the food system, and from proactive action that may be taken by society and government to adapt the system to target specific and desired outcomes.

If a robust set of indicators can be established for measuring the security of the food system, these can be quantified relative to the existing food system, and become the baseline level of performance through which future changes can be measured. Over time, these indicators continue to be monitored and measured to determine if progress toward the achievement of desired outcomes is being achieved. The feedback will provide the rationale for improved and more effective approaches to meeting desired objectives. This becomes the basis for efficient and effective planning and implementation.

Figure 12: Food Security Measurement Indicators



Suggested Food Security Indicators

As previously discussed, indicators need to be established to measure the status of food security in the existing food system, and to measure changes overtime as the system evolves, or as deliberate actions are taken to bring about change. There has been considerable research into attempting to defining security indicators for Vancouver.[115,116] Specific indicators have, for the most part, not been developed or applied in other communities.[117]

Table 22 proposes a possible range of food security indicators for consideration. The indicators are classified as to the outcome they are attempting to measure. The suggested indicators are separated as direct indicators which are under local control, and indirect indicators that are useful to measure but outside local control.

[115] Ibid, Food System Assessment for the City of Vancouver
[116] Rideout, K., B. Seed and A. Ostrey. 2006., Putting Food on the Public Health Table: Making Food Security Relevant to Regional Health Authorities. http://www.healthycitiesill.org.au/publications/Ostrey%20Paper.pdf
[117] See Thompson, ER., AM Harper and S. Kraus. 2008. The San Francisco Foodshed Assessment American Farmland Trust. This report is an exception. http://www.farmland.org/programs/states/ca/Feature%20Stories/San-Francisco-Foodshed-Report.asp

Table 22: Suggested Food Security Indicators

Food Security Outcome	Food Security Indicators	
	Direct	Indirect
Economic Health	➡ Number of days local food supply ➡ Proportion of food produced locally ➡ Farmers/processors net income ➡ Net gain/loss in type and number of farms/farming area ➡ Changes in amount of agricultural productive land ➡ Amount of food wasted (gap between food disappearance (primary production) and consumption. ➡ Level of social assistance paid	➡ Level and distribution of household income as measured by Gini Index ➡ Rate of unemployment ➡ Level and rate of population growth ➡ Relative average price of food staples
Environmental Health	➡ Index of use of chemical fertilizers, pesticides, insecticides ➡ Adoption of IPM, completion of EFPs, Implementation of BMPs ➡ Proportion of organic food production ➡ Carbon footprint and energy use in production, processing, distribution of food ➡ Average distance food travels for production to place consumed ➡ Level of water pollution, run-off, soil degradation	➡ Impact of climate change on production capacity ➡ Level of water consumption ➡ Proportion of farmers implementing Environmental Farm Plans ➡ Level of adoption of organic production methods, conservation and IPM practices
Human Health	➡ % population obese ➡ % people malnourished ➡ Proportion plant to animal food consumption of protein, fats and carbohydrates	➡ Incidence of chronic disease ➡ Quality of diets – level of fruit, vegetable, cereal consumption
Social Health and Equality	➡ Proportion of food produced in urban agriculture ➡ Number of people served by charities/food banks ➡ Distribution of retail food outlets ➡ Number of social assistance agencies	➡ Number and trend in number of agricultural producers ➡ Number of market gardens, community gardens ➡ Degree to which disadvantaged have access to healthy food as compared to general population.

These indicators are presented as first possibilities. The way in which they can be measured, and the data requirements of each is a subject for the next phase of this project.

It is proposed that some of the above indicators be selected to be used to measure food security in Vancouver. However, it is suggested that to establish a baseline on the current status of food security, a baseline survey be designed and undertaken within each of the major neighbourhoods within Vancouver. This survey could be modelled on the survey conducted by Health Canada in 2004.[118] This primary survey was conducted in selected homes. Direct questions were asked of individuals to determine

[118] Health Canada, Canadian Community Health Survey, Income Related Food Security, 2004.

incidence by which there were difficulties in accessing food and the reasons why – such as income, lack of mobility, not available, cost of eating, etc. Other survey information such as Cost of Eating survey information is also valuable.

This is considered an important step both to establish the current level of food security, and to get behind the reasons for food insecurity. This will then lead to the design of solutions and actions specific to the causes of food insecurity.

The most critical indicators would relate first to measuring the level of income stress within the community. This would include measures with respect to the number of individuals and families receiving income assistance, employment insurance beneficiaries, the average level of disposable income, and people using the services of charitable organizations such as food banks and soup kitchens.

More indirect indicators could include a range of health indicators (obesity rates, chronic disease rates, malnourishment rates), environmental indicators (carbon food print, use of chemical, fertilizers, etc), economic indicators (level of farm net income, financial status within the processing sector) and existing food preference indicators (availability of local food, proportion of local origin food purchased, purchasing determinants).

FOOD SECURITY INITIATIVES IN VANCOUVER

There currently are a range of existing programs and initiatives in Vancouver that support food security. Some of these are highlighted below.

THE COMMUNITY FOOD SECTOR

This sector which provides food security support includes community kitchens, community gardens, farmers markets and good food boxes. The focus here, rather than emergency food provision, as is provided by the charitable food sector, is to provide opportunities for individuals to grow their own food, to support local farmers, and to increase local capacity.

There are estimated to be more than 50 community kitchens[119], 4 summer farmers markets (2 winter farmers markets) and at least 34 community gardens in the city of Vancouver.[120]

COMMUNITY FOOD ACTION INITIATIVE (CFAI)

Vancouver Coastal Health is working in partnership with communities across the region to address food security issues. Currently, there are 8 local Community Food Action Initiative (CFAI) committees in the Vancouver Coastal Health Authority. The local committees include Richmond, Vancouver, North Shore, Sea-to-Sky, Sunshine Coast, Powell River, Bella Bella and Bella Coola. Each Committee has completed an environmental scan, a food system assessment and gap analysis and a 3-year action plan. This initiative is assisting by funding both the development of the plans and their implementation in each of the 8 health service delivery areas and health service areas. Vancouver Coastal Health is also working to develop closer linkages between these food security initiatives and VCH policies, programs and services. Fraser Health operates similar programs.

Some food security initiatives supported by the CFAI are listed below.

This is not a complete list of food security initiatives and programs within Vancouver .

[119] The Citizen's Handbook. See http://www.vcn.bc.ca/citizens-handbook/2_03_comm_kitchens.html
[120] See Community Gardens in Greater Vancouver and Victoria. http://www.cityfarmer.org/vanccomgard83.html

The Good Grub Project' by East Richmond Community Association

Engages low-asset youth in the planning and preparation of healthy meals and spearheads the introduction of healthy menus to schools within the community.

Colts Connect in the Kitchen' by Family Services of Greater Vancouver (Richmond)

Increases food security for young parents in Richmond by researching their nutritional status via a focus group, providing cooking demonstrations with take-home meals and encouraging community partnerships, including regular access to a Community Kitchen supported by a Community Kitchen facilitator.

'Kidsafe Cooking Fun for Families' by KidSafe Project Society

Works towards food security and health status of inner city families by teaching cooking and nutrition through a Community Kitchen program at several locations, nutrition and Food Safety workshops, as well as through the planting and harvesting of local gardens.

'North Shore CFAI Advisory Committee' by North Shore Neighbourhood House

The Advisory Committee was established to identify local food security projects on the North Shore.

'Richmond Sharing Farm Outreach Program' by Richmond Fruit Tree Sharing Project Society

Provides hands-on experience growing nutritious organic food for children and low-income families through developing plots at community allotments and the Sharing Farm.

'Strathcona Hunger Prevention and Nutrition Education Program' by Strathcona Community Centre Association

Increases awareness and practice of healthy nutrition in Asian and western families, including a specifically targeted project for Grade 7 & 8 boys to learn how to prepare snacks and meals for their younger siblings, through Food Safe training, cooking sessions at a Community Kitchen, workshops and field trips, as well as the printing of a recipe book.

'Food for Now' by Wilson Heights United Church

Increases the capacity of the church's emergency food bank to reach more people in southeast Vancouver with nutritious food. This program includes maintaining a food drawer with nutritious foods including fresh fruits and vegetables as well as Gift Certificates for healthy foods, Community Meals that feed as many

as 100 persons/meal, and a Community Garden where people can plant and harvest food.

THE CHARITABLE FOOD SECTOR

In the current food system, the charitable food sector is perceived by many to be evidence of its inability to provide community food security. This situation, however, should not be allowed to obscure the uncertainty to which societies are exposed with respect to food production nor the uncertainty associated with future unpredictable events. Even in the most organized and planned normal circumstances, a shock to a perfectly equitable system could result in need for emergency response. In the event of a catastrophe, there is a good reason to maintain the capacity represented by the food charity network. The challenge may be to put it to other useful purpose until when it is needed.

There are a wide number of the programs provided by the charitable sector that distribute food, and provide low cost or free meals and shelter. There are at least 100 charitable food programs operating in the city of Vancouver.[121] Some of the major organizations are the Dug-out Drop in Centre, the Evelyn Saller Centre, the Franciscan Sisters of Atonement, the Carnegie Centre, and the Greater Vancouver Food Bank.

[121] Ibid, Food System Assessment for the City of Vancouver, P.50