
Increasing Fruit and Vegetable Consumption In British Columbia

Prepared by: Estelle Dufresne, RDN
Health Promotion Consultant

in consultation with

Ryna Levy Milne, PhD, RDN
Faculty of Agricultural Sciences
University of British Columbia

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Executive Summary

A global trend is occurring with increased emphasis on fruit and vegetable consumption in prevention of chronic disease. This trend is based on scientific evidence.

Epidemiological and clinical evidence indicates that increasing intakes of fruit and vegetables decreases the risk of major chronic diseases including cancer, coronary heart disease, stroke, hypertension, type 2 diabetes, diverticulosis, cataracts, macular degeneration and chronic obstructive pulmonary disease. A recent study demonstrated a 20% reduction in all-cause mortality independent of age, blood pressure, blood cholesterol, cigarette smoking, diabetes, and supplements with an increase of one serving of fruit and vegetables per day. Extensive reviews have summarized that eating at least five servings of fruit and vegetables per day could reduce cancer rates by 20%, reduce coronary heart disease by 20 – 40%, and reduce stroke by 25%. This reflects the potential to reduce B.C. health care costs by over \$1 billion annually.

Although attempts have been made to understand the protective mechanisms of specific nutrients within fruit and vegetables, the one consistent finding is the protective effect of eating *whole* fruit and vegetables. In fact, some trials using high-dose single-agent nutritional supplements have resulted in adverse effects.

The B.C. Nutrition Survey conducted in 1999 will provide baseline data on the fruit and vegetable consumption of British Columbians. The results will be available in 2002. Other surveys in Canada have determined low intakes of fruit and vegetables in certain segments of the population. Also, one recent study indicated that although fat intake has decreased since 1970, the percentage of calories from extra foods was greater than 25%. This demonstrates an opportunity to further improve Canadian eating habits by promoting increased intake of fruit and vegetables.

Several countries are taking leadership in promoting increased consumption of fruit and vegetables. The first priority in Australia's food and nutrition policy is increasing consumption of fruit and vegetables to at least five servings per day. A National Action Plan for 2000 – 2005 has been developed that incorporates multiple strategies and a multi-sectorial approach.

Britain's National Health Services Plan includes five-a-day program to increase fruit and vegetable consumption. It has a specific focus on accessibility of fruit and vegetables, and plans to work with industry to achieve increased accessibility. It also includes a National School Fruit Scheme where every child in nursery school as well as school children aged four to six will receive a free piece of fruit each day.

In the United States, the National Cancer Institute (NCI) and Produce for Better Health Foundation (PBH) launched the 5 A Day for Better Health Campaign in 1991. The program is a multilevel public-private partnership, in which the public and private sectors work together at the national, state, and local levels. Fruit and vegetable consumption in the United States has increased since the inception of the program.

Nationally, NCI and PBH conduct market research, develop promotional themes and materials, generate publicity, work with industry, and fund research. At state and local levels, partners build on these to organize and run complementary interventions. Collaboration with federal agencies, such as the U.S. Centers for Disease Control, the U.S. Department of Agriculture, and the Indian Health Service as well as national organizations such as the American Dietetic Association, extend the reach of the program and help to leverage re-

sources to develop and disseminate materials and behavior change strategies. State health authorities and local industry participants work together via community coalitions to deliver the 5 A Day message and interventions to targeted populations in a variety of settings including food assistance programs, media, schools, worksites, supermarkets and foodservice.

The American Institute of Cancer Research launched The New American Plate in September 2000. This program integrates a cancer and chronic disease prevention message with sound advice about safe, effective weight management. The two key messages are proportion (ensure that at least two-thirds of a meal or plate is composed of plant-based foods like vegetables, fruit, whole grains and beans; and one-third or less is animal protein) and portion (assess and modify the size of portions typically consume).

In Canada, the 5 to 10 a Day: Are You Getting Enough? Campaign has been implemented by the Canadian Produce Marketing Association, Canadian Cancer Society, and Heart and Stroke Foundation. The key target audience is women aged 25 – 45 years. A social marketing approach is being used that includes use of mass media, community outreach, and educational opportunities to assist people in improving their fruit and vegetable consumption. Toolkits are being distributed to community nutritionists in health regions throughout Canada in the spring of 2001. These kits will include sample educational and promotional materials for order, a template media release, an overview of innovative initiatives from across Canada that have used campaign resources, and creative concepts for regional events to be conducted in summer 2001. It is hoped that local health units will help organize and participate in these regional events; however, no formal partnerships have been established.

In British Columbia, the agri-food industry supports the 5 to 10 a Day: Are You Getting Enough? Campaign through membership in the B.C. Produce Marketing Association. The provincial association contributes financially to the national campaign and local industry uses the promotional resources. The industry also participates in the Buy B.C. Program sponsored by the Ministry of Agriculture, Food and Fisheries.

Provincial non-profit health organizations promote healthy eating that includes consumption of fruit and vegetables as one of several health messages. The B.C. divisions of the Canadian Cancer Society and Heart and Stroke Foundation do not have any specific programs planned as part of the 5 to 10 a Day Campaign other than supporting the national publicity activities.

At the regional level in British Columbia, increased access to fruit and vegetables is supported through several food security initiatives such as community gardens, community kitchens, community supported agriculture, farmers' markets, food policy councils, fruit tree projects, and good food boxes. Expansion of these programs has been limited by lack of resources for infrastructure support.

Community nutritionists within the regional health authorities promote fruit and vegetable consumption as part of a larger healthy eating message when conducting presentations to varied groups, supermarket tours, and media work. Community nutritionists also advocate for accessibility of fruit and vegetables in their work with community-based initiatives such as food banks, school meal programs, pregnancy outreach programs, community kitchens, good food boxes, food policy councils, and cardiovascular disease intervention projects.

Although some fruit and vegetable promotion is taking place in British Columbia, both the literature and environmental scan demonstrate the need for a coordinated provincial approach.

The literature indicates that successful interventions have clear, concise actionable messages; have long-term multi-pronged approaches; have participatory models with broad representation; are based on theoretical models; and have adequate training, support and resources.

The environmental scan indicates the need to integrate and enhance current awareness campaigns and food security initiatives, to develop interventions for other target groups (youth, seniors, disabled), and to develop supportive policies and infrastructures. There is a desire to have a sustained, coordinated approach that makes measurable impacts on fruit and vegetable consumption in British Columbia.

Promoting increased fruit and vegetable consumption for British Columbians provides the opportunity to improve the health of the population, to reduce health care costs, to increase economic benefits to the agri-food industry, and to enhance existing partnerships and programs. It also provides the opportunity to shift from multiple punitive nutrition messages, which demonize specific foods, to one simple and positive message that makes it easier for people to take advantage of health benefits.

The recommendations are:

Policy Interventions

- 1) Establish a B.C. Fruit and Vegetable Action Plan as a long-term multi-faceted strategy to support Health Goal for B.C. #6 – reduction of preventable illness, injuries, disabilities and premature deaths.
- 2) Revise the Health Goals for B.C. to include *the percentage of the population consuming 5 to 10 servings of fruit and vegetables per day* as an indicator for the objectives related to enhancing personal well-being and reducing chronic disease.
- 3) Establish a provincial food and nutrition policy to ensure that all people at all times have equitable and dignified access to sufficient, safe, health and culturally appropriate foods including 5 to 10 servings of fruit and vegetables per day.
- 4) Review the proposed provincial agri-food policy to ensure it supports increased fruit and vegetable consumption.
- 5) Develop standards and guidelines to increase accessibility and consumption of fruit and vegetables in all government funded programs and institutions involved in food service and provision.

Awareness/Communication Interventions

- 6) Maximize impact of 5 to 10 a Day: Are You Getting Enough? Campaign by coordinating national and provincial efforts.
- 7) Advocate for Health Canada to become a contributing partner to expand the national 5 to 10 A Day: Are You Getting Enough? Campaign.

Program Interventions

- 8) Support community-based initiatives for fruit and vegetable promotion through specifically targeted funds and streamlined funding mechanisms.
- 9) Develop tools and training to support best practices in food service establishments and to support implementation of policy related to increasing accessibility of fruit and vegetables in government funded food programs and food services.

Research Interventions

- 10) Conduct research to determine the motivation and barriers to fruit and vegetable consumption as well as best practices for fruit and vegetable promotion for youth, seniors, and disabled.
- 11) Establish mechanisms to support best practices including dissemination of best practices, access to expert partners in intervention development, and adequate funding of research interventions.

Infrastructure Support

- 12) Establish multi-sectorial partnerships in fruit and vegetable promotion.
- 13) Facilitate stakeholder consensus on the objectives and approach to fruit and vegetable promotion.
- 14) Mobilize cross government endorsement and involvement in fruit and vegetable promotion.

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1. Introduction

The B.C. Ministry of Health commissioned the Faculty of Agricultural Sciences at the University of British Columbia to prepare a discussion paper on increasing fruit and vegetable consumption in the province. The purpose of this document is to support community nutritionists, the B.C. Ministry of Health, and other key constituents in responding to low fruit and vegetable consumption anticipated in the B.C. Nutrition Survey results as well as enhancing participation in the national 5 to 10 A Day: Are You Getting Enough? Campaign.

A literature review of the evidence linking fruit and vegetable consumption to prevention of chronic disease was done. A literature review of best practices in fruit and vegetable interventions was also completed.

A scan of international, national, provincial and regional initiatives related to increasing fruit and vegetable consumption was conducted. This was not meant to be an exhaustive process but to provide a preliminary overview of initiatives, opportunities, and partnerships. International information was collected via Internet search and e-mail. National and provincial organizations as well as members of the food industry were contacted by telephone. Community nutritionists within regional health authorities were sent an initial e-mail. Subsequent e-mail and telephone follow-up was carried out in an attempt to obtain at least one community nutritionist response per health region. The B.C. members of Dietitians of Canada were notified of the scan in the organization's e-mail newsletter.

The information summarized in this paper is meant to support informed decision making related to increasing fruit and vegetable consumption. The recommendations build on the evidence, best practices, and existing infrastructures to facilitate health and economic benefits for British Columbians.

2. Evidence Related to Fruit and Vegetable Intake

2.1 Disease Specific Assessments

Overall, the epidemiological evidence indicates a protective effect of fruit and vegetables in relation to a number of chronic diseases.

A recently published study found that the equivalent of 50g per day (one serving) increase in fruit and vegetable intake, was associated with a 20% reduction in all-cause mortality independent of age, systolic blood pressure, blood cholesterol, cigarette smoking, diabetes and supplement use (1).

2.1.1 Cancer

The most convincing evidence for the health benefits of fruit and vegetables relates to the risk of cancer; it is most marked for epithelial cancers such as cancer of the lung, esophagus, mouth, stomach, colon and pancreas (2, 3).

Extensive reviews have been conducted in the past ten years. A review published in 1992 found a statistically significant protective effect of fruit and vegetable consumption in 128 out of 156 dietary studies (4). Results are summarized in table 1.

Table 1
Review of epidemiological studies on cancer showing protection by consumption of fruit and vegetables (3)

Cancer Site	Fraction of studies showing significant cancer protection	Median relative risk of low quarter vs. high quarter consumption
Epithelial		
Lung	24 / 25	2.2
Oral	9 / 9	2.0
Larynx	4 / 4	2.3
Esophagus	15 / 16	2.0
Stomach	17 / 19	2.5
Pancreas	9 / 11	2.8
Cervix	7 / 8	2.0
Bladder	3 / 5	2.1
Colorectal	20 / 27	1.9
Miscellaneous	6 / 8	-
Hormone Dependent		
Breast	8 / 14	1.3
Ovary/endometrium	3 / 4	1.8
Prostate	4 / 14	1.3
Total	128 / 156	

In 1997, the World Cancer Research Fund and American Institute for Cancer Research (WCRF/AICR) released a joint report examining the relationship between fruit and vegetable consumption and cancer in 247 studies (3). When studies of all cancer sites were examined, 78% of these studies showed a significant reduction in risk for a higher intake of at least one fruit and/or vegetable category. The protective effects of fruit and vegetables relative to specific cancers are summarized in Table 2.

Table 2
Strength of evidence for protective effects of fruit and vegetables (4)

Evidence	Factors Decreasing Risk	Cancer
Convincing	Vegetables and Fruit	Mouth and Pharynx Esophagus Lung Stomach
	Vegetables	Colon Rectum
Probable	Vegetables and Fruit	Larynx Pancreas Breast Bladder
Possible	Vegetables and Fruit	Cervix Ovary Endometrium Thyroid
	Vegetables	Liver Prostate Kidney

The WCRF/AICR report summarized:

- Eating the recommended five servings of fruit and vegetables each day could reduce cancer rates by more than 20%.
- Healthy eating combined with staying physically active and maintaining a healthy weight could reduce cancer risk a further 30 – 40%.
- Recommended dietary choices coupled with not smoking could potentially reduce cancer risk by 60 – 70%.

In 2000, Health Canada reviewed the scientific evidence (13 studies from 1996 – 2000) published since the WCRF/AICR report pertaining to the beneficial effects of consuming a diet high in fruit and vegetables as related to the risk of cancer (5). Although some discrepancies were noted, the addition of the recent data to the WCRF/AICR report would not alter the overall conclusions that “There is a strong and consistent pattern showing that diets high in vegetables and fruit decrease the risk of many cancers, and perhaps cancer in general.”

2.1.2 Coronary Heart Disease

Dutch researchers reviewed the findings of 12 studies with focus on foods, rather than nutrients, and estimated risk reduction for coronary heart disease to be up to 20 - 40% (6). Another review examined 28 studies and concluded a protective effect of fruit and vegetables (7).

2.1.3 Stroke

Although evidence is still limited, results of 5 studies in the Dutch review estimated the risk reduction for high fruit and vegetable intake may be up to 25% for strokes (6). Another review of 8 studies relating to stroke concluded that the protective effect of fruit and vegetables was even stronger than in coronary heart disease (7).

2.1.4 Hypertension

The DASH (Dietary Approaches to Stop Hypertension) study examined the effect of whole foods, instead of individual nutrients, on hypertension (8). Subjects were randomly assigned for eight weeks to a control diet, a diet rich in fruit and vegetables (8 – 10 servings of fruit and vegetables), or the DASH diet, which was high in fruit, vegetables and low fat dairy products, and lower in total fat, saturated fat and cholesterol. The results indicated that both the higher fruit and vegetable diet, and the DASH diet lowered blood pressure although the later was more effective.

2.1.5 Diabetes

At a population level, increased consumption of plant foods has been associated with lower incidences of obesity and type 2 diabetes (2,9).

2.1.6 Diverticulosis

The role for diet in the prevention of diverticulosis first came from epidemiologic data. People in less industrialized countries with higher fibre diets had much lower risk for diverticulosis than people from industrialized nations (10). More recent data (11) suggests that insoluble fibre has the most protective role, in particular cellulose, explaining the association between fruit and vegetable fibre and lower risk of diverticulosis (12).

2.1.7 Cataracts and Macular Degeneration

Investigators in one study found a significant five-fold reduction in relative risk for cataracts among consumers of more than 1.5 daily servings of fruit and vegetables (13). In a cohort study of middle and older aged people, dietary sources of fibre and carotenoids were associated with lower risk of cataracts, particularly for men (14). In a cohort study of women aged 45 –67 years, dietary carotenoid intake was associated with lower risk of cataract extraction; people with high carotenoid intakes had a 39% lower risk of cataract extraction (15).

Findings from a number of studies suggest that people who smoke and have low levels of carotenoids and vitamins C and E in their blood are at risk of developing macular degeneration. Experimental studies suggest that two carotenoids in particular – lutein and zeaxanthin – are accumulated by the macula. These findings suggest that macular degeneration may be prevented by ensuring adequate intake of fruit and vegetables (16).

2.1.8 Chronic Obstructive Pulmonary Disease

The findings of five epidemiologic studies suggest a high intake of fruit and vegetables enhances ventilatory function, thereby reducing risk of chronic obstructive pulmonary disease (17).

2.1.9 Other Chronic Diseases

Some indicative data exists for arthritis, Alzheimer's, gallstones, inflammatory bowel disease, multiple sclerosis, osteoporosis, Parkinson's, respiratory diseases, and ulcers. However, the evidence is too limited at this time to draw any conclusions regarding fruit and vegetable consumption.

2.2 Proposed Mechanisms

Class/Component	Source *	Potential Benefits**
Anthocyanins	Strawberries, cherries, cranberries, raspberries, blueberries, grapes, black currants, radishes	Antioxidant; inhibit LDL oxidation; inhibit platelet aggregation
Carotenoids		
Alpha-carotene	Carrots	Antioxidant; inhibits cell proliferation
Beta-carotene	Orange coloured fruit and vegetables such as: Carrots, sweet potatoes, squashes, spinach, pumpkin, cantaloupe, mango, apricot	Antioxidant; inhibits cell proliferation; helps in differentiation of normal epithelial cells
Lutein	Green vegetables such as Spinach, chard, asparagus, peas	Antioxidant; protects against cataracts and macular degeneration
Lycopene	Tomatoes and tomato products, watermelon, pink grapefruit, guava	Antioxidant; may reduce risk of prostate cancer; may also protect against breast and cervical cancer; decreases LDL cholesterol oxidation.
Zeaxanthin	Citrus, corn	Antioxidant; protects against cataracts and macular degeneration
Fibre		
Insoluble	Fruit and vegetables	Protects against diverticulosis
Soluble	Fruit and vegetables	Binds and dilutes carcinogenic substances; helps control blood sugar levels and cholesterol levels
Flavenoids	Most fruit and vegetables	Antioxidants, may reduce cell proliferation; inhibit blood clot formation; anti-inflammatory action
Glucosinolates/Indoles	Broccoli, bok choy, cauliflower, brussels sprouts, cabbage, kale, mustard greens, rutabaga, turnip	Protects against estrogen-promoted cancers; induces protective enzymes
Phytoestrogens		
Isoflavones	Soy beans	Protect against breast and prostate cancer
Lignans	Vegetables	Antioxidant; may block or suppress cancerous changes; lowers LDL cholesterol, total cholesterol and triglycerides
Saponins	Soy beans, lima bean, pinto bean, chickpea, kidney bean, lentils, split peas	May lower LDL cholesterol; contains anticancer enzymes
Sulfides		
Diallyl sulfide	Onions, garlic, leeks, scallions, olives	Stimulates anticancer enzymes, detoxifies carcinogens, antibacterial activity may inhibit conversion of nitrate to nitrite, thereby reducing formation of nitrosamines
Allyl methyl trisulfide	Broccoli, bok choy, cauliflower, brussels sprouts, cabbage, kale	Stimulates anticancer enzymes, detoxifies carcinogens, antibacterial activity may inhibit conversion of nitrate to nitrite, thereby reducing formation of nitrosamines
Dithiolthiones	Broccoli, bok choy, cauliflower, brussels sprouts, cabbage, kale	Increase activity of enzymes involved in detoxification of carcinogens and other foreign compounds
Vitamins		
Folate	Asparagus, broccoli, brussels sprouts, peas, spinach, orange juice, legumes	Inadequate intake may lead to chromosomal damage at sites relevant to specific cancers; may lead to reduced methylation of DNA which may permit loss of normal controls on the expression of genes
Vitamin C	Broccoli, brussels sprouts, peppers, citrus, berries	Antioxidant; reduces nitrite, thereby reducing formation of nitrosamines
Potassium	Most fruit and vegetables	May prevent or control hypertension and subsequent risk of stroke and heart disease

* not an exhaustive list ** references (17 – 19)

2.3 Recommended Intakes of Fruit and Vegetables

2.3.1 World Health Organization

The World Health Organization study group on diet, nutrition and prevention of communicable diseases recommended that we consume at least 400 grams (14 oz.) of fruit and vegetables, including at least 30 grams (1 oz.) of pulses, nuts, and seeds (20).

2.3.2 Canada

Canada's Food Guide to Healthy Eating encourages consumption of five to ten servings a day of vegetables and fruit. The National High Blood Pressure Prevention and Control Strategy (21) and the Canadian Coalition for High Blood Pressure Prevention and Control (22) acknowledge healthy nutrition as important in the prevention of high blood pressure including intake of fruit and vegetables. The Prevention Working Group for the Canadian Strategy on Cancer Control recommends that Canadians consume 5 – 10 servings of vegetables and fruit per day as part of its strategy to reduce cancer incidence, morbidity, and mortality.

2.3.3 United States

The U.S. Food Guide Pyramid recommends 5 – 9 servings a day. The U.S. Department of Agriculture (USDA) gave fruit and vegetables greater prominence in the latest version of their Dietary Guidelines for Americans. A previous USDA guideline that combined advice to eat plenty of vegetables and fruit with advice to consume a variety of grain products was broken into two separate and distinct guidelines in an attempt to draw added attention to each of these foods (23).

2.3.4 Australia

The National Health and Medical Research Council (NHMRC) recommends intakes equivalent to 7 servings a day of fruit and vegetables (2 fruit; 5 vegetable). These are based on estimates of amounts required to meet the Recommended Daily Intakes (24).

2.3.5 Britain

The National Health Services Guide recommends that people "aim for at least five servings of fruit and vegetables every day" (25).

2.4 Fruit and Vegetable Consumption in Canada

British Columbia Nutrition Study was conducted in 1999 and the results will be available in 2002. The Canadian Community Health Survey (CCHS) is being developed by Statistics Canada for the purpose of providing regular and timely cross-sectional estimates of health status for 132 health regions across Canada (26). It will include a section on fruit and vegetable consumption with the following questions:

- How often do you usually drink fruit juices such as orange, grapefruit or tomato?
- Not counting juice, how often do you usually eat fruit?
- How often do you eat green salad?
- How often do you usually eat potatoes, not including french fries, fried potatoes, or potato chips?

- How often do you eat carrots?
- Not counting carrots, potatoes, or salad, how many servings of other vegetables do you usually eat?

In the Quebec Nutrition Study, an average of five servings of fruit and vegetables were consumed daily, however, 25% of the population ate no vegetables and 35 – 45% of the population ate only one serving of fruit per day (27).

A recent survey of food habits in Canadians aged 18 – 65 years found low consumption of fruit and vegetables – 4.6 servings per day – with the lowest intakes found in females aged 18 – 49 years and older men aged 50 – 65 years. Foods considered as extras and not part of the four food groups provided 26 – 29% of energy. This study noted under representation of low-income people and exclusion of some nutritionally at-risk people i.e. children living in poverty and the frail elderly.

A positive finding of this study was that decreased fat intake and higher intakes of some micronutrients were noted in comparison to the first national dietary survey completed in 1970. These findings indicate that initiatives to improve Canadian food habits have worked, in particular, the low fat message. However, additional initiatives – including fruit and vegetable promotion – are required to further improve Canadian eating habits in order to reduce the incidence of chronic diseases (28).

2.5 Health Impact and Cost Considerations

Cancer accounts for 30% of deaths in British Columbia. The economic burden of cancer (1993) was \$1.09 billion – \$.27 billion in direct costs (drugs, physicians, hospitals, research) and \$.82 billion in indirect costs (mortality, short and long term benefits). Estimated costs of cancer relative to low fruit and vegetable consumption are \$.29 billion (3,29).

Cardiovascular disease accounts for 40% of deaths in British Columbia. Costs in 1993 were \$2.25 billion – \$.61 billion in direct costs and \$1.64 billion in indirect costs. It is estimated that \$.45 - \$.9 billion is attributable to low fruit and vegetable consumption (6,29).

The economic burden of diabetes in British Columbia in 1993 was \$80 million – \$40 million in direct costs and \$40 million in indirect costs. This is an underestimate because the economic costs of complications of diabetes, such as cardiovascular disease and renal failure are not included in these figures. No research group has attempted to estimate the proportion of diabetes attributable to low fruit and vegetable consumption. However, it is estimated that 30% of diabetes is attributable to diet or \$24 million (29,30).

2.6 Insights

2.6.1

Fruit and vegetables are associated with a lowered risk of chronic disease.

The one consistent finding is that consumption of fruit and vegetables lowers risk of chronic disease, even though the mechanisms are not fully understood. The focus of attention should be shifted to eating a variety of *whole* fruit and vegetables rather than on consuming specific nutrients (17,31).

2.6.2

Increased intakes of fruit and vegetables have not caused harm; high doses of a single nutrient can cause harm.

No studies have demonstrated harmful effects of fruit and vegetable consumption at recommended levels. High dose, single-agent nutritional supplementation can have adverse effects as demonstrated in the beta-carotene and cancer trials; these effects can occur in a very short period of time (17,31).

2.6.3

Some of our hypotheses may be wrong.

In the early 1980's, it was thought that dietary fat caused breast cancer and cereal fibre protected against colon cancer. More recent evidence indicates that, at least in adulthood, dietary fats are largely unrelated to breast cancer risk and cereal fiber to colorectal cancer. However, both of these hypotheses have been difficult for people to dismiss (31).

2.6.4

Nutrition attracts headlines; public focus is skewed.

The public is increasingly confused regarding nutrition and chronic disease because of competing and conflicting messages. Findings about single foods or nutrients make good headlines but the consistent findings regarding fruit and vegetables have gone largely unreported (31).

The major causes of cancer (other than smoking) do not involve exogenous carcinogenic chemicals; they are dietary intake, hormonal factors, infection, and inflammation (32). Yet, people's perception of the causes of cancer and of their ability to prevent cancer through altering diet and lifestyle do not reflect the facts. Only 7% of Canadians are aware that eating fruit and vegetables can decrease their risk of cancer (33).

2.6.5

Consumption of fruit and vegetables is lower than recommended.

Many jurisdictions report lower than recommended intakes of fruit and vegetables. The British Columbia Nutrition Study will confirm whether this also is true for our population.

2.6.6

Barriers to increasing fruit and vegetable consumption need to be addressed.

Barriers to increasing fruit and vegetable consumption include (34):

- Perception that vitamin supplements are acceptable replacements for fruit and vegetables.
- Concern over pesticide contamination.
- Perception that fruit and vegetables have to be eaten fresh and raw.
- Acceptability of eating only fruit.
- Perception that 5 – 10 servings is a large amount of food.
- Addition of vegetables and fruit to one's diet is considered to be too time consuming.
- Accessibility and cost of fruit and vegetables.

3. Best Practices

Best practices are simply those that have worked well elsewhere – they have been proven to have successful results. Knowledge of best practices supports practitioners in conducting evidence-based practice and decision makers in developing policy, resulting in the best outcomes with the wisest use of resources.

Two Canadian groups conducted reviews of nutrition interventions directed at primary prevention:

Cancer Care Ontario (CCO)

- reviewed published studies from 1994 – 1999 with outcomes related to fruit and vegetable consumption, fibre consumption, or fat consumption (35)
- assessed relevant articles for their effectiveness, plausibility and practicality. Relevant studies were categorized into one of the following: effective (randomized control trial with positive results), promising (weak study design with positive results, or program not evaluated), and negative (randomized control trial with no impact)

Ontario Public Health Research, Education and Development (PHRED)

- reviewed published studies to August 1998 related to increasing fruit and vegetable consumption (36)
- rated relevant articles for their validity (quality) based on research design only. A rating of strong, moderate or weak given to each study. Outcomes were not included in their rating.

Studies published between 1999 and March 2001 were reviewed by the author of this discussion paper using the CCO criteria. Reviews from all sources are summarized in this section of the discussion paper. It includes an overall summary of effective interventions as well as lessons learned and description of interventions for specific target groups.

3.1 Key Elements of Effective Interventions

The most effective interventions:

- Give clear, strongly worded, simple messages focused on changing a specific behavior (eat five or more servings of fruit and vegetables a day) versus focused on a broad nutrition message (eat a healthy diet)
- Have messages that reinforce the benefits to the target group and articulate actionable items that are appropriate for them
- Incorporate multiple strategies that reinforce the messages
- Are of adequate intensity and duration rather than being one-time events
- Are based on a theoretical framework
- Use participatory models for planning and implementing interventions
- Target a person's stage of change
- Include education directed at behavioral change as opposed to only acquisition of information
- Provide essential training and support
- Actively involve influential people such as family members and peer leaders as important sources of support
- Consider the political climate in which the intervention is being implemented
- Keep the lines of communication open between the implementing body and other organizations

3.2 Interventions with Low-income Mothers

Lessons learned:

- It is critical to determine (e.g. focus groups, interviews) women's attitudes, knowledge and practices to ensure program appropriateness (content of sessions, food preparation and resources).
- Barriers to dietary change need to be addressed in the intervention i.e. families' dietary practices and norms, and financial risk of trying new foods in the home.
- Peer educators are effective group leaders.
- Sessions should incorporate a high degree of client interaction and practical information.
- Barriers to attendance at group sessions should be understood and addressed (e.g. lack of transportation, work schedules, lack of interest, lack of child care).

Interventions with low-income mothers – overview of studies

Effectiveness	Study	Setting	Target Group	Approach	Factors	Outcomes/ Comments
Best Practices	Maryland WIC 5-A-Day Promotion Program U.S. Havas et al. (37)	Community	3122 low-income women 16 WIC sites	Group sessions led by peer educators (3 over 6 months) Print materials and reminders (4 different packages mailed to participants)	Vegetables and fruit	Increased F/V consumption of .56 svgs/day and .13 in control group (both from 3.88 svgs/day). Intervention participants showed greater progress in stages of change, knowledge, attitudes, and self-efficacy. Attendance at nutrition sessions had positive outcome on F/V consumption. Control group received usual WIC intervention.
	Expanded Food and Nutrition Education Program (EFNEP) + Health Futures – Virginia U.S. Cox et al. (38)	Community – in home or small neighborhood groups	150 low-income women	Educational intervention delivered by nutrition paraprofessional 18 sessions - 2x/week for 6 months Health Futures (heart disease prevention)	Vegetables and fruit Fat	Statistically increased consumption of F/V in intervention group vs. “usual” EFNEP control group.
	EFNEP – California U.S. Del Tredici et al. (39)	Community	663 low-income mothers – 355 EFNEP and 328 control	Instruction over 6 mos. Mean visits = 7.8 Time/visit = 80.5 min Lectures, written material, demonstrations	General nutrition Food selection, preparation and safety	Increase in F/V consumption from 2.6 – 3.7 svgs/day. Also increase in Vitamin C and A rich foods as well as variety of F/V consumption.
	Head Start – New York/Maryland U.S. Koblinsky et al. (40)	Community	171 mothers 3 New York sites 2 Maryland sites 3 control sites	13 weekly nutrition letters, 4 workshops (2 hours duration, 2 weeks apart)	Nutrition and pre-school child, meal preparation, planning, shopping	No overall change in F/V intake in New York groups which had higher baseline levels. Maryland group had increase in fruit consumption and Vit. C and A foods.
Promising	Friends with Food UK Kennedy et al. (41)	Community	Low income mothers	4 yr demo project Educational sessions led by dietitian Food preparation and cooking sessions	Fat Fruit and vegetables	Improved knowledge for fat reduction, distinguishing nutrition facts from misconceptions and understanding of health benefits of vegetables and breads. Reduction in families' intake of dietary fat.
	Promotion of Vitamin A Rich Foods Bangladesh Hussain et al. (42)	Community	Low income mothers 482,673 households	Media/Communication 13 approaches evaluated Direct contact: household visits and group sessions by trained volunteers. One way communication: Folk singers, village projectors, radio, TV, newspaper, posters.	Vitamin A rich foods	Use of folk singers, women volunteers and village film projectors was most effective. Exposure to mass media was lower among illiterate and lower SES. Effective communication of messages through direct contact not affected by SES or literacy. Most effective communication methods: direct contact and traditional forms.

3.3 Interventions with School Children

Lessons learned:

- Multi-pronged interventions of longer duration and with clear, concise messages result in better outcomes.
- Formative assessment process is desirable i.e. gather information about the people for whom, and the context in which the intervention should be delivered. It helps to identify student behavior, determinants of those behaviors, and resources to facilitate change.
- Participatory models help to identify critical features of an intervention. The involvement of school officials is necessary for successful implementation of nutrition education programs. Teachers and community members can help develop curriculum and provide advice regarding content and cultural relevance. Children can identify appealing strategies for development and implementation. Clear identification of schools' needs and ways that partners can address those needs can assist in partnering with industry.
- Use of a combination of approaches is recommended i.e. direct education and environmental support.
- Direct education using a pre-tested curriculum is desirable.
- Thorough training needs to be provided for teachers as well as reducing the amount of time needed by the teacher to prepare for teaching the program activities.
- Methods to disseminate interventions to teachers should be personalized, timely, and ensure that materials and training are easily accessible.
- Curriculum should maximize skill building through fun, interesting and interactive activities: hands-on food preparation, computer programs, and supermarket tours.
- Environmental support can be accomplished through in-school media events, point-of-purchase cafeteria promotion and increased offerings of fruit and vegetables in cafeteria/school lunches and snacks. Food service staff must be trained to implement modifications.
- Parent involvement is critical but challenging. More research needs to be done to find effective ways to help parents support dietary change at home.
- Community support can be integrated through grocery stores and producers contributing fresh produce as well as including industry in in-class presentations and resource development.

Interventions with school children – overview of studies

Effectiveness	Study	Setting	Target Group	Approach	Factors	Outcomes/Comments
Best	High 5 Alabama U.S. Reynolds et al. (43,44)	Elementary School	Grade 4	Classroom- 14 lessons Parent – kick-off night; package for parent/child homework and activities Food Service	Fruit and vegetable	Mean daily intake of fruit and vegetable higher for the intervention children compared to controls at 1 and 2 yr. follow-ups. Mean consumption for intervention parents was higher at 1 yr. follow-up but not at 2 yr. follow-up.
	The Cookshop Program New York U.S. Liquori et al. (45)	Elementary School	K – Grade 6 39 classes 590 students	Classroom lessons and food preparation Team teaching: teacher, parents, college students Parent newsletter Food service	Vegetables and whole grains	Positive effects on preferences, knowledge and consumption in both younger and older children, and on behavioral intention younger children, and cooking self-efficacy in older children. Lessons impacted knowledge only.
	5-a-Day Power Plus Program Minnesota, U.S. Perry et al. (46)	Elementary School	Grade 4 – 5 20 schools	Behavioral Curriculum – 16 (45 min.) sessions given 2x/week for 16 weeks Parents – 5 information/activity packets Food Service Coalition/industry support	Fruit and vegetable	Increase in lunch-time fruit consumption, lunch-time vegetable consumption among girls, and daily fruit consumption.
	California Children's 5-a-Day PowerPlay Campaign Foerster et al. (47)	Elementary School	Grade 4 - 5	Media Classroom – 14 activities selected from 5-a-Day Resource Kit; teachers required to conduct at least 10 activities over 8 week intervention period Community activities targeted to children and parents	Fruit and vegetable	Increase in fruit and vegetable consumption. Increase highest in group with school plus community intervention. Significant increases in daytime snacks and lunch which children have most control over. Increase in belief that children should eat 5 or more servings of F/V per day.
	Gimme 5 New Orleans U.S. Nicklas et al. (48,49)	High School	Grade 9	School media marketing campaign School meal and snack modifications 5 workshops (55 min) over 3 years Parents – info mailings	Fruit and vegetable	Consumption of fruit and vegetable higher in intervention schools at interim; effect maintained but not increased throughout program. Positive shift from baseline in stages of change.
	Nutrition in a Changing World Graves et al. (50) Shannon et al. (51)	Elementary School	K - Grade 6	Curriculum – 9 weeks Food services Posters and activity sheets	Nutritious foods	Significant increase in consumption of broccoli, carrots, spinach salad and green beans. Knowledge improvement in K – Grade 5 but not Grade 6. Improved attitude for eating F/V but not new foods.

Interventions with school children – overview of studies (continued)

Effectiveness	Study	Setting	Target Group	Approach	Factors	Outcomes/Comments
Promising	The Pathways Study Minnesota U.S. Snyder et al. (52)	Elementary Schools	Grade 3 – 5 American Indian Children	Classroom curriculum Physical education program Food service program Family involvement	Fat intake and healthy food choices - obesity prevention	Results from feasibility phase only: Family activity packs well received. High attendance and satisfaction with family fun night. School based family advisory councils not well received. Food service personnel adopting many of the behavioral guidelines.
	Show the Way to 5-a-Day Vermont U.S. Harvey-Berino et al. (53)	Elementary Schools	Grade 3	Teacher resource guide and training Facilitated linkages with local grocery stores to provide produce	Fruit and vegetable	Only dissemination evaluated. 47 of 135 schools (35%) accepted guide. 7 schools received teacher training. 17 were linked with grocery store. Schools with teacher training and linked to grocery store more likely to use guide.
	Trumansburg Study New York U.S. Demas (54)	Elementary School	K – Grade 4	Curriculum –related to history, lore of foods as well as foods from other cultures Food Preparation Food Journals Composting	Fat – acceptance of new low fat foods	Total of 16 new foods served in school year. Intervention children ate from 3 – 20 times more new foods than control children. Children requesting parents to take them to grocery store to find new foods to prepare at home.
	Pricing strategy – cafeteria Minnesota U.S. French et al. (55)	High School		Policy – price lowering for fruit, salad and baby carrots by 50%	Vegetables and fruit	Fruit sales increased by 4x during low price period; carrot sales increased 2x. No intervention effects on salad sales. No significant change observed in total dollar sales; important because actions to increase healthy foods need to be introduced without reduction in revenues for school services.
	FACETS Curriculum U.S. Schinke et al. (56)	Community	Aboriginal Youth	Curriculum developed based on youth survey Native Americans trained to deliver program Youth recruited by group leaders	General dietary practices Tobacco reduction	An increase in knowledge of diet-cancer relationship was found along with willingness to adopt risk-reducing behavior. Self-efficacy regarding diet increased. Dietary fat intake was reduced for intervention youth.

Interventions with school children – overview of studies (continued)

	Study	Setting	Target Group	Approach	Factors	Outcomes/Comments
Promising	5-a-Day Virtual Classroom U.S. DiSogra et al. (57)	Elementary School	K – 6 2600 participants	Social Action Students provided with Internet opportunity to counsel President Clinton on how to motivate children to eat 5 servings of fruit and vegetables per day.	Fruit and vegetable	Suggestion categories most cited: Mass media use (19.8%) Economic issues (15.4%) Social influence (13.8%) Most frequent specific ideas: Rewards for eating F/V Use of presidential authority
Negative (Good research design; no impact)	CATCH U.S. Perry et al. (58)	Elementary School	Grade 3, continued through to Grade 5 1186 students in 96 schools	Curriculum (15 – 24 lessons) Food preparation and tasting Family education – 15 activity packages and family fun nights Food service	Fat Fruit and vegetables Physical Activity	Follow up at end of grade 5. No impact on fruit and vegetable consumption. Significant impact on increasing physical activity and decreasing fat intake.
	Girl Scout Troops U.S. Cullen et al. (59)	Community	Grade 4 – 5 22 troops 259 girls	1 session / week for 4 weeks Food preparation and taste testing Parents – information package	Fruit and vegetable	Increased fruit and vegetable consumption one week post test; not maintained at 3 month post test.
	Shannon et al. (60)	Elementary School	Grade 3, continued through to Grade 5	Curriculum – 9 – 12 weeks per year Posters and table tents for cafeterias	Eating a variety of foods	No significant differences in intervention and control group. If entry knowledge and attitude scores were low, children in intervention improved more than control.

3.4 Interventions with Adults

Lessons learned:

General

- Community interventions with very broad messages have no impact on fruit and vegetable intake.
- Stages of change model should be used in designing a comprehensive intervention that includes all of the target audience, not just those in the action stage of change.
- Worksite
- Multi-pronged worksite interventions have statistically significant impacts on intake; successful interventions include policy and environmental factors that can alter workplace “culture” to be more health conscious as well as education directed at employees’ knowledge and behaviors.
- Worksite health promotion works well with a “menu approach” and a defined minimum intervention.
- Social support is an important guiding theory in worksite interventions.
- Kickoff events are useful in raising awareness about a new initiative.
- Environmental support can be provided through change in cafeteria and vending machine offerings, combined with point-of-purchase education.
- Incentives/competitions are effective in motivating employees.
- Engaging employees in a health promotion is best done by attaching intervention activities to events salient to the employees e.g. “Super bowl” events.
- Family support can be enhanced using learn-at-home programs, newsletters and annual family worksite events.

Health Care Setting

- A brief, low-intensity intervention in a family practice setting can be effective in affecting dietary change provided that physicians and staff are trained to assist with implementation, a standardized brief protocol is developed for physicians and staff to follow, self-help materials are developed using a theoretical framework, and follow-up activities include physician reinforcement.

Multicultural Groups

- Materials need to incorporate ethnic foods and local terminology.
- Family members should be invited to attend sessions to foster social support and in some cultures, to create a social atmosphere in keeping with cultural norms.
- Session leaders should be of similar ethnic background to the group members.

Interventions with adults – overview of studies

Effectiveness	Study	Setting	Target Group	Approach	Factors	Outcomes/Comments
Best	Seattle 5-a-Day U.S. Beresford et al. (61)	Worksite	Workers from a variety of industries Worksites: 250 – 2,000 employees 28 worksites	Employee advisory boards developed protocol from common skeleton and min. set of activities: Kick off event Self-help manual Food services Menu of other promotional materials/events 2 year intervention	Fruit and vegetable	Increased intake of fruit and vegetables across all intervention worksites. Little association between worksite characteristics and behavior change (e.g. size of worksite, male/female ratio) or between the number of activities and behavior change. Worksites with medium avg. baseline intake of F/V most responsive.
	Peer Health Education Program Arizona U.S. Buller et al. (62,63)	Worksite	Lower socioeconomic, multicultural labor and trade public sector employees 2091 participants 10 public employers	Baseline survey 18 month intervention program - mail, cafeteria, presentations Identification of social networks (cliques); communication leaders of cliques trained as peer educators to deliver information in last 9 months of intervention	Fruit and vegetables	Significant increase with peer education: 0.77 servings/day based on food recall and 0.46 servings/day based on food frequency. 6 month follow-up: food recall indicated significant increase of 0.41 servings/day; food frequency indicated decrease of 0.04 servings/day.
	Treatwell 5-a-Day Massachusetts U.S. Sorensen et al. (64,65)	Worksite	Workers from a variety of industries 22 worksites	Core programs: Individual behavior change Worksite environment change Family involvement	Fruit and vegetable	At baseline, gender, education, occupation and living situation significantly associated with fruit and vegetable consumption but not with changes in the study. Workers in the worksite intervention reported a 7% increase (0.2 servings/day) in F/V while those in worksite plus family group reported a 19% increase (0.5 servings/day).
	Working Well Trial U.S. Bermer et al. (66) Glanz et al. (67) Sorensen et al. (68)	Worksite	Workers in a variety of industries: manufacturing, communications, public service, utilities 28,000 participants 108 worksites	Awareness: kick-off event, info materials, self-assessments, campaigns, contests Skill development: small group behavioral programs, self-help brochures and videos, brown bag discussions, cook-offs Environment: employee advisory committees and workplace coordinators, workplace audits, policy reviews, food service operations assessment/revision Duration 80 – 125 weeks	Dietary behavior Cigarette smoking	Intake of fruit and vegetables increased by 0.2 servings per day in intervention group and 0.02 in control group. Movement through stages of change more likely in intervention group. 82% of process objectives achieved (relates to delivery of and participation in the intervention).

Interventions for adults – overview of studies (continued)

Effectiveness	Study	Setting	Target Group	Approach	Factors	Outcomes/Comments
Best	Black Churches United for Better Health Project North Carolina U.S. Kramish-Campbell et al. (69,70)	Community	Rural African American church members 2519 adults 50 churches	Activities targeting predisposing factors: tailored bulletins, print materials Activities targeting enabling factors: gardening, educational sessions, cookbook and recipe tasting, serving more fruit and vegetables at church functions Activities targeting reinforcing factors: lay health advisors, community coalitions, pastor support, grocer-vendor involvement, church initiated events	Fruit and vegetable	At 2 year follow-up, intervention group consumed 0.85 servings/day more than the delayed intervention group. Largest increases in people 66 years or older (1 serving), those with education beyond high school (0.91 servings), those widowed or divorced (0.96 servings) and those attending church frequently (1.3 servings). The least improvement occurred in 18 – 37 years and those who were single.
	Women's Health Trial Feasibility Study in Minority Populations Southern U.S. Coates et al. (71)	Community	Postmenopausal women (n = 2,208; aged 50 – 79 years)	Group sessions – weekly for 6 weeks, biweekly for 6 weeks, monthly for 9 months and then quarterly. Sessions led by nutritionist and integrated nutritional and behavioral change strategies.	Fat Fruit and vegetable Grain	Significant reduction in fat intake and increase in fruit and vegetable intake at 18 months post intervention. Grain consumption declined.
	Take Five U.K. Cox et al. (72)	Community	Adults – consuming less than 5 F/V svgs and contemplating increasing F/V intakes	Intervention groups received 8 week program that included: educational approaches on how to achieve 5 svgs/day (lecture, print materials, portion assessment), motivational approaches (magnets, fridge reminder boards, recipes, tasting sessions), behavioral approaches (self-monitoring diary record)	Fruit and vegetables	65% of intervention participants achieved more than 5 F/V svgs/day at end of program, 45% at 6 month follow up and 44% at 12 month follow up. The five strategies favored by participants: Fruit as a snack, vegetables with a main meal, fruit as dessert, fruit juice (limited to one portion per day), and salad.
	Women's Health Trial U.S. Gorbach et al. (73) Henderson et al. (74)	Community	Women at risk for breast cancer aged 45 – 69 years	Group sessions – weekly for 8 weeks, biweekly for 6 months, monthly for 4 months Individual session with nutritionist at 2 and 12 weeks	Fat Fruit and vegetable Grain Calorie reduction	Fruit and vegetable intake significantly increased in intervention group from baseline of 15.9% of total kcal/day to 22% at 12 months and 23.1% at 24 months. Total energy intake decreased by 25% in intervention group with mean weight loss of 3.1 kg. Fat intake reduced in intervention group from 39% to 22% of total energy.

Interventions for adults – overview of studies (continued)

Effectiveness	Study	Setting	Target Group	Approach	Factors	Outcomes/Comments
Best	The Eating Patterns Study Seattle U.S. Beresford et al. (75)	Health Care	Clients of 28 physician practices in 6 primary care clinics Predominantly female (92%) White (75%) College educated (27%)	Self-help booklet Physician endorsement (3 minute introduction and reminder letter signed by physician sent 2 weeks later) Physician training to introduce booklet	Fat Fibre	Significantly larger reduction in fat intake in intervention group at both 3 and 12 months. Both groups increased fibre intake, but control group did not sustain increase to 12 months. Intervention had greatest impact on those in action and maintenance stages of change.
	National Heart Foundation "Exercise" Australia Booth et al. (76) Owen et al. (77)	National	Adults	Mass media- 2 campaigns in May 1991 and 1992 Campaigns included: Paid national TV ads PSA's on radio Distribution of professional paper Print materials Publicity tours	Physical activity	Significant changes in walking and intentions to exercise in 1990. No such changes in 1991. Authors conclude that second campaign may have been redundant.
Promising	Kansas Farm Bureau Worksite Cafeteria Intervention U.S. Perlmutter et al. (78)	Worksite	Adults	Marketing campaign directed at increasing acceptability of healthy entrees in worksite cafeteria. Evaluated differences in perception of modified entrees that were marketed or not.	Fat Sodium	No significant differences for any sales data for modified entrees over 9 month period. No significant differences in overall acceptability of modified entrees, but acceptability rated higher when the entrees were marketed as lower in fat and sodium.
	Computer-Tailored Nutrition Intervention Netherlands Brug et al. (79)	Worksite	Workers from a major oil company	Computer generated letter tailored to each workers' dietary behavior, attitudes, perceived social influences, self-efficacy expectations and awareness levels.	Fat Vegetable and fruit	Significant reduction in fat consumption, attitudinal change, and intent to reduce fat and increase F/V consumption in intervention group.
	Environmental Intervention to Increase Fruit and Salad Purchases U.S. Jeffery et al. (80)	Worksite	Workers from a university office building	Policy – pilot study in cafeteria. Selection of fruit and salad bar choices increased by 50% and 30% respectively. Price of both fruit and salad reduced by 50%. Advertising with posters in cafeteria and flyer in each employee's mailbox.	Vegetable and fruit	Threefold increase in fruit and salad purchases during intervention period. When intervention stopped, fruit and salad purchases dropped but remained slightly above baseline, attributable to salad purchases. Substantial number of employees reported they were trying to control food intake because of weight, cholesterol or sodium concerns.

Interventions for adults – overview of studies (continued)

Effectiveness	Study	Setting	Target Group	Approach	Factors	Outcomes/Comments
Promising	Partners in Prevention Nutrition Program U.S. Kramish-Campbell et al. (81)	Health Care	Adults	Individually computer tailored messages aimed at behavior change among adults visiting their primary care physician for any type of medical appointment.	Fat Vegetable and fruit	Significant decreases in fat intake but had no impact on F/V consumption in intervention group. Tailored intervention groups' message recall was greater than those who received non-tailored messages.
	Cancer Information Service (CIS) Educational Intervention U.S. Marcus et al. (82)	Community	Adults	Pilot study conducted over 12 days. Brief message provided at end of usual service plus 2 follow up mailings. Messages and materials drawn from 5-a-Day for Better Health Program.	Vegetables and fruit	Increased consumption of F/V in intervention group. 75% of subjects endorsed proactive provision of information. Adherence to intervention protocol by CIS information specialists was high. CIS callers not representative of general population – 90% white, 85% female, 75+% college education.
	Pricing strategy- vending machines U.S. French et al. (83)	University	Adults	Policy re: pricing. Nine vending machines at one university. Low-fat snacks identified by placement of bright orange price label below each item. Usual prices of low-fat items similar to regular snacks.	Fat	80% increase in low-fat snacks sold during low-price period. Sales of regular snacks declined modestly during low-price period and increased post-intervention. Overall sales volumes not affected.
	Green Keyhole Nutritional Campaign Sweden Larsson et al. (84)	Community	Adults	Policy – Swedish National Food Administration (1989 – ongoing) Supermarket labeling of low-fat, high fibre foods with a green keyhole symbol.	Fat Fibre	Significant increase in fibre intake in those that understood label; no difference in fat intake. Younger women and those with higher BMI had better understanding of label.
	California's 5-a-Day for Better Health Campaign U.S. Foerster et al. (85)	Community	Adults	Campaign – 3 year intervention. Simple specific message Mass media Point-of-purchase messages Partnership between state health department, produce and supermarket industries	Vegetables and fruit	Increased public awareness of benefits of F/V consumption. Increased consumption among white and African-American adults but drop by Latino adults. Created ongoing partnership between public health and agribusiness.
	"Eat for Health" Supermarket Intervention U.S. Rodgers et al. (86)	Community	Adults	2 year intervention; 105 supermarkets participated. Point-of-purchase messages Monthly bulletin with nutrition info and recipes Multimedia advertising campaign	Vegetables and fruit Fat Fibre	Significant increase in fresh produce consumption; negative effects for canned vegetables, canned and frozen beans. High compliance rates for shelf labels, food guide, produce signs; monthly bulletin had low compliance rate.

Interventions for adults – overview of studies (continued)

Effectiveness	Study	Setting	Target Group	Approach	Factors	Outcomes/Comments
Negative	Teach Well U.S. Resnicow et al. (87)	Worksite	Teachers 32 Schools	Gimme 5 curriculum taught in intervention and control schools. Teacher wellness program added to intervention group: 54 health workshops over 2 years; exercise program offered 2 – 3 times per week at each school	Vegetables and fruit	No evidence that intervention affected any of the risk factors, behavioural, or cognitive end points. No significant differences in motivation to change student behavior, for efficacy to help students change their behavior, or job satisfaction between intervention and control group. Significant increase in F/V consumption in control group
	Take Heart U.S. Glasgow et al. (88)	Worksite	Workers from 26 sites	18 month multifaceted program: Employee steering committees Kick-off event Menu of activities – worksites encouraged to conduct at least 2 activities out of 8 cells in a matrix	Fat Smoking	No improvements in diet patterns or cholesterol levels. No changes in stages of change.
	Pound of Prevention Study U.S. Jeffery et al. (89)	Community	Adults – 228 men; 998 women	3 year intervention Randomized into 3 groups: No-contact control, monthly newsletters, monthly newsletter plus incentives. Every 6 months, the 2 intervention groups invited to participate in group education sessions.	Obesity prevention Physical activity	37% of study participants maintained or lost weight; 63% gained weight.
	Stanford Nutrition Action Program (SNAP) U.S. Howard-Pitney et al. (90)	Community	Low literacy, low-income adults 361 participants	Six week classroom intervention delivered by nutrition professional followed by 12 week maintenance intervention (contact by phone or mail every 2 weeks)	Fat	Improved knowledge, attitudes and self-efficacy among intervention group. No differences in fat consumption between intervention and control group.
	Iowa Demonstration Cancer Control Project U.S. Kristal et al. (91)	Community	Adults	Eight month supermarket point-of-purchase program: Flyer identifying sale items Store signage Food demonstrations	Vegetables and fruit	No increase in fruit and vegetable consumption Slightly significant (8.4%) increase in intervention group in the action or maintenance phases of dietary change.

Interventions for adults – overview of studies (continued)

Effectiveness	Study	Setting	Target Group	Approach	Factors	Outcomes/Comments
Negative	Bootheel Heart Health Project Brownson et al. (92)	Community	Adults	Development of coalitions for heart health Examples of activities: walking clubs, cooking demos, blood pressure and cholesterol screening, cardiovascular education sessions	Lifestyle including diet	No change in proportion of people consuming fruit and vegetables between coalition or control communities

3. 5 Interventions for All Populations

Lessons learned:

Food Service

- Availability of nutritious foods at schools, worksites and other community settings needs to provide healthful food choices available at attractive prices while maintaining overall profitability.
- Reduced pricing appears to be effective even in the absence of nutrition education in increasing fruit and vegetable consumption.

Mass Media

- Effective mass media campaigns break down complex behavior into steps that are easier for consumers to understand, for consumers to act on, and for the various media to communicate.
- In mass media campaigns, paid advertising with or without public service announcements (PSA's) is preferable because paid ads are strategically placed to reach the target audience rather than being placed arbitrarily to whichever programming slot is available.

Government Policy

- Funds should be provided for epidemiological surveys and the data used to provide information to develop a focused policy. The data can help to target strategies for particular subgroups within the province. Without baseline data, the effectiveness of policy effects is difficult to demonstrate.
- Adequate attention needs to be given to the resources and supports necessary to sustain implementation of the policy components rather than sole focus on development and formulation of policies.
- An administrative body, comprised of experts in the area of nutrition policy and health, should be charged with overseeing the policy implementation. The body's function includes a strategic role, coordinating role and political accountability.
- Policies should be developed and implemented using a cooperative process. Key stakeholders, including food industry, agricultural interest and non-governmental organizations, should be involved from the beginning to negotiate strategic direction.
- Funding priorities should be identified by a multidisciplinary group so they are representative of community needs.
- Evaluation of policy implementation should include:
 - monitoring degree of adoption of various measurable policy components such as production of regulated foods
 - household surveys to assess consumption
 - sales data to assess purchasing behavior
 - extent of food subsidies

Interventions for all populations – overview of studies

Effectiveness	Study	Setting	Target Group	Approach	Factors	Outcomes/Comments
Best	1% or Less Campaign West Virginia U.S. Reger et al. (93)	Community	Adults/Children	Media: Paid advertisements: radio, TV, newspapers PR events to generate news coverage	Milk fat	Market share for low-fat milk increased from 29% to 46% in month after campaign; 42% at 6 month follow-up; no variation in comparison community. Market share for high fat milk decreased from 71% to 54% in month after campaign; 58% at 6 month follow-up; no change in comparison community. 84% of respondents reported seeing TV ad; 46% recalled radio ad; 82% exposed to news coverage.
	Nutrition and Food Policy Norway Milio (94) Norum et al. (95)	National	All populations	Policy: Information and education Research and evaluation Community nutrition services Farm subsidy Food regulation and quality standards	Fat Whole grains Vegetables and fruit	Gains in information and education dissemination; implementing body had control over funds for this activity. Gains in research and evaluation, but use of these studies for informing implementation limited due to lack of resources provided by parliament. Policy did not provide for funding of nutrition-related services; goal not attained via commercial and public organizations. Met 100% self-sufficiency in feed grain, 50% in food grains, and 70% in vegetables. Only modest changes in food buying habits; 20-30% of population indicated they were trying to change their diet. Dietary fat consumption decreased. Reduction in CHD – 50% in males and 25% in females.
	Changing Individuals' Purchase of Snacks (CHIPS) Study U.S. French et al. (96)	Worksite - 12 High schools - 12	Adults/Children	Policy Evaluated four pricing levels (equal price, 10%, 25% and 50% reductions) and 3 promotional conditions (none, low-fat label, low-fat plus promotional sign). Sales of low-fat vending snacks were measured continuously for 12 month intervention.	Fat	Price reductions of 10%, 25% and 50% on low-fat snacks resulted in increased sales of 9%, 39% and 93% respectively. Promotional signage was independently but weakly associated with increases in low-fat sales. Average profits per machine were not affected by the interventions.

Interventions for all populations – overview of studies (continued)

Effectiveness	Study	Setting	Target Group	Approach	Factors	Outcomes/Comments
Promising	Leicestershire Food and Nutrition Policy U.K. Holdsworth & Spalding (97)	Regional	All populations	Policy – increase public awareness of health eating with nutrition education messages of consuming less fat, more fibre and less sugar. Policy promoted with health professionals, non-profits and schools, and general public. 25% of population South Asian so special components developed for this population.	Fat, Fibre Sugar	No summative evaluation to date.



4. Environmental Scan

4.1 International

4.1.1 Australia - Policy

'Eat Well Australia: a national framework for action in public health nutrition, 2000–2010' has four priority areas:

- increasing consumption of fruit and vegetables,
- preventing overweight and obesity,
- promoting good nutrition for women and children, and
- promoting good nutrition for vulnerable and disadvantaged groups.

These are designed to address the major nutritional challenges within Australia's National Health Priority areas including cardiovascular health, diabetes and cancer (98).

The Strategic Inter-Governmental Nutrition Alliance (SIGNAL), a national partnership of government health authorities and the nutrition arm of the National Public Health Partnership, has selected increased consumption of vegetables, fruit and legumes as their initial focus and developed a national action plan for 2000 – 2005 (99).

The goal of the National Action Plan is to increase vegetable and fruit consumption of the Australian population by at least one serving over five years. Its objectives include:

- Food supply – increase and sustain access to high quality, safe, affordable vegetables and fruit.
- Awareness – increase proportion of the population aware of the need to increase their consumption of vegetables and fruit.
- Attitudes/perceptions – increase the proportion of the population who perceive the benefits of vegetables and fruit in terms of taste, convenience, low relative cost, safety and health.
- Knowledge – increase the proportion of the population with the knowledge of the recommended minimum intakes of fruit and vegetables.
- Skills to purchase and prepare – increase the proportion of the population with knowledge, skills and confidence to select and prepare convenient, low cost, tasty vegetable and fruit dishes.

A population approach is to be taken with greater priority given to adolescents, low-income groups, and Aboriginal and Torres Strait Islander people. Interventions have been identified in the areas of policy, infrastructure support and programs.

The priority actions of the National Action Plan to increase fruit and vegetable consumption are:

National promotion

- Establish a collaborative partnership for national promotion and related activities.
- Develop a campaign plan – resources, funding, guidelines for use of logo, roles, and market research.

Food supply

- Map the fruit and vegetable supply system – access, distribution and transport, wholesaling, price availability, range, and quality.
- Develop an action agenda to address the factors that influence supply and target vulnerable groups.

Community

- Disseminate examples of effective community-based programs and develop evaluation guidelines.
- Provide seed funding for demonstration community projects.

Schools

- Coordinate the approach to promotion of vegetables and fruit in schools, through the Health Promoting Schools Framework, and relevant policies, including resource development.

4.1.2 Britain - Policy

Section 13 – improving health and reducing inequality - of The National Health Services Plan identifies improving diet and nutrition as a key strategy (100).

“13.20 Poor nutrition leads to low birth weight and poor weight gain in the first year of life, which in turn contributes to the later development of heart disease. Increasing fruit and vegetable consumption is considered the second most effective strategy to reduce the risk of cancer, after reducing smoking, and it has major preventative effects for heart disease too. Eating at least five portions of fruit and vegetables a day could lead to estimated reductions of up to 20% in overall deaths from chronic diseases. In the UK, average consumption is only about three portions a day, and a fifth of children eat no fruit in a week. Information is important, but the food choices people can make are shaped by the availability and affordability of food locally.”

“13.21 People make their own choices about what to eat. The role of Government is to ensure that people have the information and proper access to healthy food wherever they live. So by 2004 action will include:

- a new National School Fruit Scheme where every child in nursery and aged four to six in infant schools will be entitled to a free piece of fruit each day, as part of a national campaign to improve the diet of children. We will examine the practicalities of the scheme through pilots before rolling it out nationally.
- a five-a-day programme to increase fruit and vegetable consumption.

- work with industry – including producers as well as retailers – to increase provision and access to fruit and vegetables with local initiatives, where necessary, to establish local food co-operatives.”

4.1.3 United States – Policy

The United States health goals - People 2010 – contain specific objectives for fruit and vegetable consumption (101):

- to increase the proportion of persons ages 2 years and older who consume at least 2 daily servings of fruit; target - 70%.
- to increase the proportion of persons aged 2 years or older who consume at least 3 daily servings of vegetables, with at least one-third being dark green or orange vegetables; target – 50%.

4.1.4 United States – 5 A Day for Better Health Program

In 1991, the National Cancer Institute (NCI) launched the 5 A Day for Better Health Program in cooperation with the Produce for Better Health Foundation (PBH) with the goal of increasing average fruit and vegetable consumption to at least five servings a day by the year 2000. The program is a multilevel public-private partnership, in which the public and private sectors work together at the national, state and local levels (102).

NCI's role is to serve as the program's scientific voice to the public, to secure health and government partners, to conduct evaluation, and to advance intervention research. PBH's role is to facilitate implementation in the food industry, work with NCI to develop guidelines and program direction, assure program standards are maintained by industry partners, and assist with evaluation.

Nationally, NCI and PBH conduct market research, develop promotional themes and materials, and generate publicity to support all partnership activities. At state and local levels, partners can build on these to organize and run complementary interventions. Collaboration with federal agencies, such as the U.S. Centers for Disease Control and Prevention (CDC), the U.S. Department of Agriculture, and the Indian Health Service as well as national organizations such as the American Dietetic Association, extend the reach of the program and help leverage resources to develop and disseminate materials and behavior change strategies.

The state health authorities and local industry participants work together via community coalitions to bring the 5 A Day message and programs to targeted populations in a variety of settings such as food assistance programs, media, schools, worksites, supermarkets and foodservice. The program relies heavily on its state and community leaders to carry out the program in communities.

The NCI licenses all state and territorial health departments as well as industry and private partners to use the 5 A Day logo and message. The program disseminates the message and behavioral change activities through four key components:

- media and communications
- point-of-sale intervention
- community level programs

- research efforts.

From 1992 – 1997, the NCI allocated a \$27 million budget - \$16 million for 5 A Day diet and behavioral change research, \$5 million for media/communications, and the remainder for program evaluation and state health agency research. From 1997 to present, the diet and behavioral change research has continued through competitive 5 A Day grants, and through dissemination of the 5 A Day behavioral change strategies into new investigator-initiated research. The budget continues to support media communications and state health agency research and program evaluation. Both the NCI and PBH fund consumer communication activities. The NCI does not provide funding for state-level programs. States are encouraged to form coalitions involving representatives from public and private sectors.

It took over five years to build the infrastructure of the program. Average fruit and vegetable consumption in the United States increased in the first five years of the program from 3.9 servings in 1991 to 4.4 servings in 1994.

Current challenges include garnering sufficient funding and utilizing the infrastructure to further diffuse the 5 A Day message by using state-of-the-science research findings. Recommendations from a review panel at the NCI fall 2000 meeting urged the NCI to greatly expand its efforts with particular emphasis among high-risk and underserved communities.

The 5 A Day Program has been emulated in other countries: Australia, Norway, Canada, Germany and Great Britain. The experiences of other nations have reinforced the most essential elements of the U.S. model:

- A foundation in a governmental, nationwide nutrition policy that emphasizes fruit and vegetable consumption and that is supported by scientific research. This provides credibility in making the program a consumer education initiative versus just an advertising campaign.
- Strong partnerships between public, non-profit and private agencies. Each partner brings distinct resources and expertise to the process that is essential to making the program a far-reaching success.
- A public partner that is respected by the general population, acknowledged as a credible source of information and connected throughout the country.
- Industry involvement, promotion and funding that is coordinated by an organization dedicated to the 5 A Day program and performs the following functions:
 - promoting program to industry players,
 - licensing participants,
 - coordinating avenues of communication available throughout the industry,
 - developing marketing themes, campaigns and support programs, and
 - fundraising.
- A strong program identity and clear message.
- A clearly defined target audience to ensure effective use of limited resources.

- A strategic planning component – long range planning maximizes the use of program resources, funding and personnel.
- A strategy for evaluation and measurement.

Other criteria for success identified in the U.S. experience are:

- A program structure that leverages the resources of a wide variety of organizations and mobilizes a cadre of motivated professionals already in place at the national, state and local levels.
- A strong commitment to strategic planning and open communication between public and private partners at all levels is essential to the ongoing viability of the partnerships.
- A service-marked logo, with corresponding program guidelines and criteria, is key in establishing a common framework in how the 5 A Day Program is conducted. The service-marked logo licensing process is essential in keeping industry program efforts in line with the public health community program focus. The licensing process also has been helpful for state-level coalitions in order to define standards of practice.
- In tracking industry activities for process evaluation purposes, growers are good, however, retailers seldom complete activity reports, are difficult to contact or are in a situation that makes tracking difficult. Sales information tends to be proprietary.
- Effective use of funds for communications is to influence the influencers e.g. magazine food editors, newspaper editors, physicians, dietetic associations, and human resource personnel.

4.1.5 United States – The New American Plate

The American Institute for Cancer Research launched the New American Plate program in September 2000. It integrates a cancer and chronic disease prevention message with sound advice about safe, effective weight management (103). The two key messages are:

- Proportion – ensure that at least two-thirds of a meal or plate is composed of plant-based foods like vegetables, fruit, whole grains and beans; and one-third or less is animal protein.
- Portion – assess and modify the size of portions typically consumed.

4.2 National – 5 to 10 A Day: Are You Getting Enough? Campaign

The “5 to 10 A Day: Are You Getting Enough?” Campaign is a three-year initiative that has been developed by the Canadian Produce Marketing Association, Heart and Stroke Foundation of Canada and Canadian Cancer Society. The advisory committee also includes representatives from Dietitians of Canada, National Institute of Nutrition, and City of Toronto – Department of Public Health (104).

The objective of the campaign is to elicit behavior change. The primary target audience is women aged 25 – 45 years as they do most of the grocery shopping. A social marketing approach is being used that includes use of mass media, community outreach and educational opportunities to assist people in improving their fruit and vegetable consumption.

The message is being delivered via a number of media, including public service announcements (television, radio and print), brochures, in-store displays, retail grocery flyers, media relations and community outreach. All literature will contain the 1-888-939-3333 number, provided by the Canadian Cancer Society, which will put consumers in touch with trained operators who can provide further information, referrals and pertinent literature.

Toolkits are being provided in spring 2001 to public health offices via community nutritionists. These will include sample educational and promotional materials with an order form, a template media release, an overview of innovative initiatives from across Canada that have used the 5 to 10 A Day: Are You Getting Enough? Campaign resources, and creative concepts for regional events for summer 2001. It is hoped that local health units will help organize and participate in these regional events, although no official partnerships have been formed.

Freggie and Freggie Tales is the component of the campaign for children aged 5 to 12 years old. It consists of a web site, quarterly newsletter, age appropriate recipes, and educator resources – teacher lesson plans in the areas of math, language and science as well as games.

4.3 Provincial Snapshot

This was not meant to be an exhaustive process but to provide a preliminary overview of initiatives, opportunities, and partnerships. Provincial organizations as well as members of the food industry were contacted by telephone. Community nutritionists within regional health authorities were sent an initial e-mail. Subsequent e-mail and telephone follow-up was carried out in an attempt to obtain at least one community nutritionist response per health region. The B.C. members of Dietitians of Canada were notified of the scan in the organization's e-mail newsletter.

B.C. Ministry of Agriculture – Policy

The legislative Select Standing Committee on Agriculture, Food and Fisheries developed a discussion paper, *Choosing Our Future – Options for the Agri-Food Industry*, and conducted provincial consultation in 1999 regarding an agri-food policy. No policy has been approved to date (105).

B.C. Ministry of Health – Policy

No provincial food and nutrition policy exists. There is no goal, objective, or indicator in the Provincial Health Goals specific to fruit and vegetable consumption. There is only reference to "increasing the percentage of British Columbians who have a healthy diet" (106).

B.C. Ministry of Children and Families

The School Meal Program policy specifies the following fruit and vegetable servings per meal:

- 1 –2 servings for Kindergarten – Grade 7, and
- 2 – 3 servings for Grades 8 – 12.

B.C. Produce Marketing Association

This is a non-profit organization with over 100 members consisting of growers, shippers, retailers, wholesalers, importers, customs brokers, packing firms, and government agencies associated with produce industry. Its functions include:

- supporting the national Canadian Produce Marketing Association's 5 to 10 A Day: Are You Getting Enough? Campaign including:
 - financial support
 - sponsorship of the Healthy Chef Competition - chef competition, gourmet dinner and media event held each spring in collaboration with the B.C. Chef Association. It raises awareness of the importance of fruit and vegetable consumption while raising funds for Chef Association scholarships.
 - development of an interactive B.C. web site for school aged children
 - interest in working more closely with community nutritionists
- contributing to tribunals and liaising on specific issues for the industry
- continuing education of membership through key note speakers at annual general meetings
- charitable fundraising events that include a fruit and vegetable message:

- sponsorship of the Child Run to support the Children's Hospital Kids for Cancer Program
- golf tournaments
- winter gala

B.C. Agriculture in the Classroom

B.C. Agriculture in the Classroom is a non-profit foundation whose purpose is:

- to promote an awareness and understanding in B.C. schools of sustainable agriculture and food systems.
- to enable students to make informed decisions about food choices, food safety, the importance of the food supply and other agricultural products as well as the protection of B.C.
- to foster an awareness of careers to be found in the agriculture and food systems.
- to attract funding for research, development and implementation of programs to meet the above stated purposes.

It provides resources for teachers to use in the classroom including:

- Grow B.C. Teacher's Handbook – specific section on fruit and vegetables and what is produced in their local areas; provided free to all teacher librarians in B.C.
- All About Food – Agri-Food Facts.
- Tips for Fairs – how to create proper displays, education and awareness activities.
- Beans and Their Buddies – Grade 1 book focusing on beans, apples, pumpkin and corn seeds.
- Teachers Unit Plans
 - Apples – Grade 1
 - Harvest Festival – Applied Culinary/Visual Arts
 - Beyond French Fries – Science – Grade 9
 - Hot House Foods – Cafeteria Training

Primary teacher training workshops are conducted as well as a Summer Institute for Educators (K-12).

B.C. Dairy Foundation

The B.C. Dairy Foundation provides teacher workshops and resources for school aged children including:

- Food Explorers – new K-Grade 1 program that provides children with the opportunity to explore new foods through collecting cards among food groups. There are a total of 16 cards – 4 for each food group. Fruit and vegetables include

squash, apple, potatoes and berries. In one year, teachers are expected to introduce at least 8 foods to their class (at least 2 from each food group).

- Food for Us – Grade 2-3 program that focuses on balanced meals (one food from each food group) and healthy snacks (a food from one of the food groups).
- Food Sense – Grade 4 – 6 program that uses the Food Track tool to assess a day's intake, pick a problem food group and make plans to increase the food group in that child's diet.
- Space Ship 5-5-3-2 – developing a CD-Rom based on a space game that is currently being developed for Grades 6-8. It uses principles from the Food Track tool that encourages the appropriate number of servings from each food group.
- Impact of Your Food Choices Workshop – a workshop for secondary grades that encourages youth to buy local. It uses the B.C. Food Guide.

In a pilot project the B.C. Dairy Foundation conducted three years ago, children in Grades 2-3 did a self-analysis of their lunch at the last session of a ten-session program. The results of 100 children from throughout the province in schools without a school lunch or school milk program indicated that only 22% ate a balanced lunch (all four food groups), 16% lacked sufficient fruit and vegetables, 9% lacked breads and cereals, 57% lacked milk products and 40% lacked meat and alternates.

Buy BC Program

This is a Ministry of Agriculture, Food and Fisheries' partnership program that provides funding to agri-food industry organizations to increase consumer awareness and build preference for B.C. food, fish, beverages, and agricultural products within the province. Program funding is available for a broad range of activities: product identification, contests, product demonstrations, advertising, public relations, point-of-sale promotions, coupons, coop advertising, market planning and research. Funding for projects is intended to support incremental market development and not substitute ongoing promotions. Opportunities exist for more cost shared proposals.

Specific initiatives include:

- Farmers' Market program – a number of promotional items are available including market banners, advertising posters, erasable price tags and recyclable plastic bags for farmers' markets that are registered non-profit organizations or sponsored by a community group, local chamber of commerce or local government.
- BC Sharing program – facilitates B.C. food donations to community food banks and the families they help as well as supporting the local agri-food industry. Shoppers can purchase B.C. Sharing coupons from participating grocery stores. Each grocery store is paired with a local food bank. Purchased coupons are reimbursed via a grocery store gift certificate to the food bank. Food banks purchase supplies of B.C. foods via a B.C. product-listing sheet that identifies B.C. products in each store.
- Buy BC Month/Events – Buy BC month takes place each September and is accompanied by launch events in several communities. September 2000 incorporated the *Eat Well Live Well* message and community nutritionists in some communities were involved in the events.

- BC Cuisine – developed in collaboration with the B.C. Restaurant and Food Service Association, this program includes: decals, server buttons, fresh sheets, fresh sheet sleeves, black and white logo sheets and logo diskette. All the B.C. Cuisine promotional materials are available at no charge to eligible restaurants. Over 730 foodservice establishments are program members.

Canadian Cancer Society – B.C. Division

The B. C. Division head office supports the national partnership in the 5 to 10 A Day Campaign by answering calls to the 1-800 line originating from B.C. and following up with written information or referral to other resources. It is awaiting the new tool kit to have the resources to build on the awareness message. Currently no activities specific to fruit and vegetable promotion are taking place at the community volunteer level, however, there is interest among volunteers to do more work in this area.

Canadian Diabetes Association – B.C. Division

Their primary nutrition program is the Cooking for Your Life Program. It is a four-week course co-taught by a dietitian and cook educator that combines nutrition education with cooking and shopping skills. It is targeted to people with diabetes and their families as well people wanting to make lifestyle choices. It is estimated that 50% of participants have diabetes or family members with diabetes and 50% of participants perceive themselves to be at-risk for diabetes. The program is offered in collaboration with the local school boards and is held in the fall, winter and spring. It is limited to six lower mainland locations due to funding constraints: Coquitlam, Maple Ridge, New Westminster, Richmond, Surrey and Vancouver.

The Cooking for Your Life Program format is:

- Week 1 – basic principles for a new way of eating which includes Canada's Food Guide and eating 5 – 10 servings of fruit and vegetables per day with an emphasis on dark green and bright orange produce.
- Week 2 – Carbohydrate, fibre, sugar substitutes, dietary fat, and cholesterol. Discussion on fibre includes the benefits from fruit and vegetables.
- Week 3 – Supermarket tour that includes having participants select fruit or vegetables not familiar to them followed by a discussion on how to select, store and prepare the selected items.
- Week 4 – Meal planning – participants analyze their food intake for one week and bring this information to class. Food intake is compared to Canada Food Guide recommendations and plans discussed as to how to incorporate appropriate foods.

All classes have a cooking component and an attempt is made to incorporate fruit and vegetables in each cooking session. It is used as an opportunity to expose participants to new fruit and vegetables and provide the skills to use them while preparing meals.

City Farmer

City Farmer is a non-profit organization based out of Vancouver. It serves the local as well as an international community in promoting urban food production and environmental conservation. It runs a demonstration garden and education programs with funding from the City of Vancouver and Greater Vancouver Regional District. It has a comprehensive web site with extensive links, and a newsletter – Urban Agriculture Notes.

Community Gardens

Community gardens use communal land to grow produce. Land is usually donated or provided for a nominal fee. Reasons for participation vary:

- health benefits – physical health (nutrition and exercise) as well as mental health
- economic – fruit and vegetable source for low-income families
- environmental – beautification of neighborhoods and crime reduction
- social – enhancement of social networks and organizational capacity, practice of traditional culture.

The scan revealed community gardens throughout most of the health regions. Locations of community gardens in Greater Vancouver, Greater Victoria, and Prince George can be accessed via the City Farmer web site. Bella Coola has a traditional First Nations garden.

The Garden Gate Training Centre in Kamloops includes a production garden, greenhouse, and training facility on one hectare of land owned by the Thompson Health Region. It offers job skills and horticultural training for marginalized groups including clients of mental health programs and people with disabilities. Community outreach includes a community garden for low-income families, gardening workshops and school tours. Initial project funding was provided by grants from the Thompson Health Region and the Ministry of Community Development, Cooperatives, and Volunteers. Many community businesses and organizations provided materials and time to get the project started. Currently, it employs a project manager and further funding proposals have been submitted to hire additional staff to support the training, garden management and community outreach components.

LifeCycles is a non-profit organization that supports community initiatives related to food, health, and urban sustainability in the Greater Victoria area. Their Growing Schools project helps Victoria schools install food gardens on the school grounds; provides a community education program for children, parents, teachers and community members; and is supported by a team made up of a coordinator and participants in their youth empowerment program called DIGS. Participants in the DIGS program are youth between the ages of 18 and 24 who are out of school and work. They receive extensive training prior to working with the school program.

In Wells, there is a school garden established by the Parent Action Committee. It is part of an overall project where the children take part in growing food, planning, preparing and cleaning up for the school meal program. The children also take the FoodSafe course. Funding is provided through the Canadian Living Foundation and the School Meal Program.

People, Plants and Homes Program, established in 1977 by B.C. Housing, offers its tenants free plants, grass seed and fertilizer to beautify their backyards and common areas. More than 1850 tenants are actively involved in the program. Large community gardens, which include vegetable production, have been established at 26 of their housing developments. The program also offers gardening workshops, supports tenant garden clubs, and hosts a province wide garden competition.

Community Institute for Sustainable Agriculture

The Community Institute for Sustainable Agriculture – still in its formative stages – is a partnership between individuals and organizations including non-governmental organizations; post-secondary institutions; municipal, provincial and federal governments; food producers, distributors, retailers and eaters; and a range of agricultural organizations and coalitions. Its mandate is to produce and disseminate knowledge and information on sustainable agriculture in B.C. as well as be a catalyst for developing a new “made-in-B.C.” extension model with participation from all partners. It will assist on projects rather than manage its own projects.

The desired outcomes of this group include:

- Those involved in sustainable agriculture endeavours in B.C. communities have access to relevant, current information, research projects and personnel and are linked to similar endeavours in other communities.
- Post-secondary educational institutions are connected and responsive to the agricultural sector; faculty and students receive ideas and opportunities for research, internships and work experience.
- Governments have access to appropriate analysis and can create policies to help sustain a healthy agricultural sector.
- Governments receive broadly-based outside support (a) to assess complex, agricultural issues, and (b) to remove impediments to effective implementation of policy.
- There is a forum and (eventually) a series of regional demonstration and interpretive centres in B.C. for continuing education in sustainable agriculture and stewardship.

Community Kitchens

A community kitchen is a group of individuals who get together on a regular basis to cook and eat as part of a group, or cook and bring several meals home. Everyone is expected to participate in the shopping, preparation, and cooking as to the best of their ability. Good nutrition plays an important role. Participants learn new recipes and are introduced to new foods, which can contribute to a more balanced diet. Meal creation and sharing becomes a social activity that benefits everyone’s health and social well-being. Community kitchens, also known as cooking clubs, sharing kitchens or collective kitchens, are member driven.

There are approximately 147 community kitchens in the province with more than 50% of them in Vancouver. The kitchens are as diverse as the people who get involved with them – from multicultural to vegetarian; family to single room occupancy hotel kitchens; youth, senior and elementary school kitchens; single people; pre and post natal kitchens, canning kitchens, single parent; and gourmet kitchens.

The Vancouver Community Kitchen Project is a collaborative venture sponsored by:

- B.C. Gas – provides financial support
- Vancouver Food Bank – provides administrative support
- REACH Community Health Centre – provides office space and equipment
- Vancouver/Richmond Health Board – provides access to information and community nutritionist support.

The Vancouver Project consists of an advisory committee with sponsor representation, part-time coordinator, and core group of volunteers that:

- Provide those interested in starting a kitchen with practical written tools, supportive information and relevant contacts in the community.
- Support existing community kitchens with monthly newsletters (once per season the topic relates specifically to fruit and vegetables), workshops (canning, food safety) and food-related events (gleaning initiatives).
- Support those interested and existing community kitchens with web site.
- Work to build active working relationships with other food security projects (Community Gardens, Food Bank, Fruit Tree Project, Good Food Box, Neighborhood Gardens, and Farmers' Markets).

Aspects of the project that are working well include:

- Getting people together to learn about what they are eating in the context of an activity versus just providing written information.
- Providing a safe environment for people to take risks i.e. trying new foods and recipes, meeting new people, and learning new skills.
- Sharing information with at-risk groups through this network; the information actually gets disseminated through the social network.
- Working together with other food organizations around the same goal of food security provides increased benefits to both the organizations and clients (e.g. Increased media profiles; Clients more likely to increase their fruit and vegetable intake if involved in a community kitchen as well as Good Food Box program).

Future opportunities include linking community kitchens to physical activity initiatives.

Community Supported Agriculture

Community supported agriculture is a program of mutual commitment between a farm and community of supporters. People pay a lump sum to the farmer in the spring in return for a weekly supply of fresh produce during the harvest season. In essence, supporters purchase a share in the season's harvest and this provides the farmer with a source of income at a time of high expense.

Examples: Over a 100 families are reported to be involved with 2 farmers in the Cariboo Health Region – one in Williams Lake and another in Quesnel – and there is a one year wait list of other families wanting to engage in this process. LifeCycles, a non-profit organization in Victoria, connects people to farmers.

Farm Folk/City Folk

Farm Folk/City Folk is a non-profit society in British Columbia dedicated to people eating local, fresh, seasonal foods, grown using farming practices that contribute to the health of the planet. Its projects are varied and collaborate with individuals and organizations across the fields of health, nutrition, environment, social justice, and international development. Projects are in the areas of: sustainable agriculture, public policy, harvest events/food celebrations, community outreach, and health, nutrition and food security. It supports a resource library, quarterly newsletter, web site, presentations, and workshops. A seven year summary of activities is listed on its web site.

Issues identified:

- Need for additional support to community gardens, farmers' markets, and community kitchens.
- Insufficient attention and support to innovative, small, local projects; these are often overlooked in favor of funding for large mega-projects run by centralized organizations or bureaucracies.
- Societal subsidization and reward of large corporations that are putting toxins into the food supply versus support of small producers who are currently having to pay to certify their produce as organic.

Opportunities are seen for increased collaboration through such groups as the initiated Community Institute for Sustainable Agriculture.

Farmers' Markets

Farmers' markets are a common area where farmers and other producers gather on a regular, recurring basis to sell a variety of fresh fruit and vegetables, baked and process foods, and local handicrafts directly to consumers.

Several community nutritionists reported farmers' markets in their health regions: Fort Nelson, Kamloops, Langley, Prince George, Quesnel, Williams Lake, Terrace and Vancouver.

The two farmers' markets in Vancouver conducted surveys of their customers. Results indicated:

- Top reasons for shopping at the market: availability of good quality fresh produce, outdoor atmosphere, sense of community and availability of organic produce.
- Over half of the respondents indicated that they had changed their shopping habits since attending the market. Of this group, over 70% indicated that they consume more fresh fruit and vegetables, 80% indicated that they eat more organic produce, and 70% (West-End) and 90% (East End) look for B.C. produce when shopping elsewhere.

- Over 90% of the respondents indicated that they took time to talk with the vendors with most of the questions about food preparation, growing methods used by the farmers, and general questions about the farm.

Gaps identified relative to farmers' markets were:

- The expectation of some customers is that food should be cheap at the markets. Eaters need to understand the cost of food production i.e. farmers have the right to earn a reasonable standard of living as much as city folk.
- Some municipalities have not recognized the economic and community building value of farmers' markets; there have been problems with zoning issues.

Opportunities identified:

- Ability of community gardens to sell produce at the markets and have a revenue source.
- Possibility of issuing coupons for pregnancy outreach and other at-risk clients for redemption at farmers' markets to increase access to fresh vegetables and fruit as well as engage them in community activities.

Food Banks

A challenge for many food banks is to provide fruit and vegetables. Some have created partnerships with community gardens, fruit tree programs, and other such programs to increase the availability. Some have established their own community garden.

Many food banks provide other services for their clients. Take a Break , a health education program offered by Evergreen Community Health Centre at Trout Lake Food Bank in Vancouver, is one example. A community nutritionist and public health nurse provide weekly service to over 100 clients on a drop-in basis during a two hour session. It provides the opportunity for food bank users to access community health staff as well as participate in a food related activity with a snack provided. Fruit and vegetables are often featured. Initial survey responses indicate participants enjoy the snack, like learning how to use fruit and vegetables, and are preparing more fruit and vegetables as snacks at home.

Food Industry

Many growers, distributors, wholesalers and retailers are members of the B.C. Produce Marketing Association and support the 5 to 10 A Day: Are You Getting Enough? Campaign. This campaign and the Buy BC Program are considered by those contacted to be the key promotional strategies for increasing fruit and vegetable consumption in British Columbia.

Company specific promotions are proprietary; more detail on retail promotion is included under supermarkets.

Some of the grower associations partner with other agencies (e.g. Buy BC, B.C. Dairy Foundation) for short-term promotion during their growing season. Many of the growers are facing economic crisis with survival being a priority and few funds available for promotion. The need to create consumer understanding of food production costs, to get away from price point, to focus on quality, and to create sustainable living for farmers in B.C. was echoed from various sectors.

Some other needs identified were:

- To compete with the fast food industry in terms of trendy ads; create excitement in eating fruit and vegetables as well as to have people select fruit and vegetables as quick snacks.
- To expand the 5 to 10 A Day: Are You Getting Enough? and Buy BC Campaigns.
- To increase value of local products e.g. ensuring consistent high quality, providing more pre-cleaned and pre-chopped items.
- To have a provincial agri-food policy and government leadership in developing an infrastructure and consistent messages within the food industry.

Food Policy Councils

Food policy councils exist to address hunger and food issues while building community and self-reliance.

The Kamloops Food Policy Council is a registered non-profit society that was established in 1995 based on recommendations from a Food Day Forum hosted by the South Central Health Unit. Some of its initiatives include:

- Advocating for the adoption of a formal food policy by the City of Kamloops and the Thompson Health Region.
- Working with the municipality to find public lands suitable for community gardens that has resulted in an increase of community gardens and establishment of Garden Gate.
- Supporting the establishment of farmers' markets.
- Working with food banks and other groups to develop self-sufficient food programs such as community kitchens and Good Food Box.
- Linking farmers and eaters through gleaning programs.
- Supporting the formation of an organic food coop.

Food for Kidz is a coalition of organizations, agencies, groups and individuals in the South Fraser Health Region addressing child hunger. The purpose of this coalition is to increase community awareness and responsibility to eliminate child hunger, advocate for hungry children and encourage programs to feed children and promote health local food systems. Accomplishments include:

- Public forum attended by 200 participants.
- United Way funding and implementation of hunger assessment.
- Directory of No and Low Cost Food Sources.
- Presentation to the Select Standing Committee on Agriculture, Food and Fisheries.

- Development of harvest box program, school lunch bag program at White Rock food bank, school breakfast program at Aldergrove Elementary School, and summer camp food program which provides food for children not bringing lunches or snacks.

The Vancouver Food Policy Organization is a non-profit organization consisting of 60 members whose priorities are:

- Getting food security issues on the municipal agenda,
- Providing a supportive network for groups working on food issues, and
- Advocating for policy changes related to those issues including a submission in December 1999 to the Select Standing Committee on Agriculture, Food and Fisheries.

Food policy councils also exist in Bella Coola, Mission, Prince George, Quesnel , and Victoria.

Fruit Tree Projects

The B.C. Fruit Tree Project, founded in 1999, is a community initiative that operates in four neighborhoods: Mount Pleasant, Little Mountain, Cedar Cottage, and Kitsilano. The project connects people who have fruit trees, people who can help harvest fruit, and community groups that use fruit in their programs. It also offers canning and pruning workshops to pass on skills. The fruit tree hotline is active year-round, however, the main part of their activity falls between July and October.

The Victoria Fruit Tree Project is coordinated by LifeCycles. Volunteers tend fruit trees and harvest fruit from people's backyards. Some of the harvest is provided to the landowner and the remainder is donated to community programs such as the food bank.

Good Food Box/Good Food Bag/Harvest Box Programs

These programs provide a non-profit fresh fruit and vegetable distribution system usually targeted to low-income people or other people who have difficulty accessing fresh fruit and vegetables (i.e. seniors, disabled). Customers pay a fee to cover the produce cost, however, the infrastructure to run the program is supported by community organizations, grants, and volunteers. Attempts are made to buy local produce when available. Such programs make top-quality fresh produce available in a way that does not stigmatize people, fosters community development, and promotes healthy eating.

The Good Food Box Program that serves the communities of Vancouver, Burnaby, and New Westminster has been in operation for one year and has 200 customers. Boxes are assembled by volunteers in donated warehouse space and then shipped to 22 depots (community centers, daycares, neighborhood houses, etc) where customers pick up their boxes. Fifty percent of the volunteers are program recipients. Boxes are supplied once per month and include a newsletter that provides recipes, nutrition and community information. Partners include REACH Community Health Centre (administers funds), TallGrass (provides warehouse space), St. James Society, and the depots. Funding is provided by Vancouver Foundation, Hydrex Fund, VanCity Credit Union, Capers, REACH, Vancouver/Richmond Health Board, United Way, and B.C. Ministry of Community Development, Cooperatives and Volunteers.

Some of the other programs throughout the province are:

- Abbotsford Best Babies Program – Good Food Box
- Aldergrove Good Food Box - serves 35 low-income clients and is administered by Aldergrove Neighborhood Services
- Cranbrook Better Babies Program – Good Food Box
- Kamloops Good Food Box – is administered by the Salvation Army
- North Okanagan Good Food Box – serves 450 families in Vernon, Armstrong, Salmon Arm and Salmon Arm; is a collaboration between Salvation Army, Boys and Girls Club, Family Resource Centre, Pregnancy Outreach Programs, and Canadian Mental Health Association
- Surrey Harvest Box serves 24 at-risk families and 60 at-risk students attending Kwantlen College. Expansion of the program is planned, however, the logistics of finding a suitable warehouse space has been a limiting factor.

Benefits of these programs include:

- More choices of self-sufficiency particularly in working collaboratively with community kitchens, food banks, and other food security programs.
- Programs get people out of their homes and connect them to community services when they pick up their box.

Challenges cited:

- Popularity of programs, both demand to increase number of customers as well as demand to increase number of deliveries per month, is such infrastructure funding is inadequate.
- Inaccessibility for seniors and disabled; delivery services are required.
- Ways of offering more services that provide revenue streams for the organization while increasing self-sufficiency for clients.
- Need for improved management and communication systems for the volunteer network.

Heart and Stroke Foundation of B.C.

At the national level, the Heart and Stroke Foundation is a sponsor of the *5 to 10 a day Campaign*; at the local level, there are no specific initiatives planned. Other nutrition initiatives that have fruit and vegetable consumption as part of the overall message of healthy eating include:

- Array of cookbooks, including Chinese and Indian cuisine; the Chinese cookbooks are also written in Chinese characters.
- Heart Smart Shopper – Nutrition on the Run book.

- Health Check Program – national program of supermarket labeling; locally, some brands of bread and yogurt have registered in the program; no fruit and vegetables have been registered yet.
- Heart Smart Restaurant Program – have not seen any specific promotion of fruit and vegetables within the food service industry.
- Heart Smart Kids Program – curriculum developed for elementary school teachers which has a fruit and vegetable component in the health eating module.
- Heart Smart Family Fun Pack – is a self-help package for families that includes fruit and vegetables as part of healthy eating.
- Recovery Road, a resource given to heart patients in hospital; Let's Talk about Stroke, a resource provided to stroke patients in hospital; and Heart-to-Heart Program, a self-help program for heart patients
- Variety of other nutrition and health related brochures.

Issues identified regarding the promotion of fruit and vegetables included:

- Lack of adequate selection in school settings and the need for:
 - Point-of-purchase campaign,
 - Access to fruit and vegetables in vending machines, and
 - Fruit and vegetables as part of combined foods in cafeteria and school meal selections.
- Selling of non-nutritious food for fundraising initiatives.
- Need to promote fruit and vegetables in the context of a healthy body image, particularly for youth.
- Lack of accurate profile of how children are eating and the implications for both increasing fruit and vegetable consumption as well as preventing of obesity.
- Need professional education for the messengers of information such as teachers, physicians and other health professionals who not well informed and not providing accurate messages.
- Need to highlight fruit and vegetables in grocery stores.
- Need for reflection of multicultural communities and how fruit and vegetables can be incorporated into traditional diets.
- Need for regulation and enforcement around the nutraceutical industry because people are looking for quick fixes and many misleading claims are made.
- Need for stronger emphasis on preventative health policies and funding within government.
- Difficulty in competing against the messages from large multinational with million dollar budgets for advertising.

HomeGrown

The HomeGrown Project run by Lifecycles in Victoria supports low-income people in establishing gardens in their back yard or balcony. It is a youth run project that grants easier access to healthy food and increases self-sufficiency.

Neighbourgardens

Neighbourgardens is a non-profit organization started in Greater Vancouver in 1999 that establishes connections between people who have garden space they do not have the ability, time, or know-how to tend with people who are wishing to have the use of a garden to grow fresh vegetables and fruit. Gardens and gardeners are matched by both neighbourhood and needs for a small donation. A core group of volunteers prepare garden sites in overgrown yards. To date, over 1200 gardens and gardeners have been matched.

Benefits of the program include:

- Opportunity for low-income families to produce their own food.
- Opportunity for seniors to have their yards tended, to have access to some of the produce, and to reduce property crime with a well-tended property and random activity in the yard.
- Opportunity for people without yards to produce their own vegetables and connect with nature.

The program has grown to include other facets:

- Vegetable gardening classes.
- Monthly newsletter.
- Web site.
- Saving Seeds in an Urban Environment book.
- Seed saving bag – to enable hand pollination in an urban environment.
- Table-top garden beds for wheelchair gardeners.
- Disabled pilot project – working with two group homes for the mentally and physically disabled to establish vegetable gardens in the group home yards. Anticipated benefits are to have residents connect with their greater environment (perceive their home to be the interior only) as well as involved in the meaningful activity of tending the yard and producing vegetables for their meals. It is hoped that this program will be expanded in 2002.
- Working with St. Paul's Hospital to provide people with HIV/AIDS and their caregivers with vegetable gardening classes.

Sponsorship is provided by VanCity Credit Union and Friends of the Environment. Community partners include Burnaby Food First Committee, Food Banks, Fruit Tree Project, and Surrey Food for Kids Coalition.

Issue identified is the difficulty for small organizations to obtain funding. Detailed funding applications for small amounts of funding are too labour intensive and application forms make it difficult to describe the program and needs adequately. It is suggested that the Van City Credit Union model be used where certain criteria must be identified in the submission, however, the organization can create its own format that can be reused in other funding submissions.

Future opportunities include adapted gardening for seniors living at home or in care facilities e.g. use of wheelchair table-top gardens. More opportunities need to be created for children and youth to be involved in food production at a younger age.

Regional Health Authorities

Community nutritionists with regional health authorities have initiated, facilitated, and/or partnered with many of the programs described in this provincial snapshot.

Community nutritionists reported no involvement in specific fruit and vegetable interventions other than activities associated with food security initiatives, the development of a middle/secondary school program in the Capital Health Region, and Buy Local/Healthy Taste of B.C./Buy B.C. special events.

Community nutritionists promote fruit and vegetable consumption as part of a larger healthy eating message when presenting to varied groups, conducting supermarket tours, writing newspaper columns, and making media appearances. Community nutritionists advocate for accessibility of fruit and vegetables in their work with community-based initiatives such as food banks, school meal programs, pregnancy outreach programs, community kitchens, good food boxes, food policy councils, and cardiovascular disease intervention projects.

Issues and gaps identified were:

- Public perception that fruit and vegetables are expensive but no understanding of the long-term benefits of consuming them; need to address cost/benefit issue.
- Need for provision of more fruit and vegetables in daycares and preschools.
- Need for specific interventions for seniors and mental health clients.
- Lack of accessibility of good quality produce in northern communities in the winter.
- Lack of budgets to include taste sampling of fruit and vegetables as part of presentations and community events.
- Limited funding resulting in a "piecemeal" approach.
- Fragile link between health and agriculture.
- Need for greater inter-sectorial collaboration.
- Need for healthy public policy around the food system.
- Need for funding focused on determinants of health and food security versus disease specific interventions.

- Need for long term core funding of programs that includes funding for formative assessment and summative evaluation.
- Need for validation of food security as an important issue.
- Need for baseline research.

Much interest was expressed in a coordinated, multi-sectorial approach to fruit and vegetable promotion that supports the integration and development of awareness campaigns, food security initiatives, and interventions for other target groups. There is desire to have a sustained, coordinated approach that makes measurable impacts on fruit and vegetable consumption in British Columbia.

Supermarkets

The Overwaitea Food Group conducts approximately 200 Shop Smart Tours per month throughout its 60 locations in B.C. About one third are Kid Shop Smart Tours. The adult tours include specific ones for heart health, diabetes, pregnancy outreach, and new immigrant groups. Some tours are conducted for health care students such dental hygienists, early childhood educators and nurses. Fruit and vegetables are an important component of the tour with a focus on variety, nutritional benefits, selection, preparation and sampling. Summative evaluation indicates that the tours have resulted in adults having an increased understanding of the benefits of increased fruit and vegetable consumption. Elements of the tour that work well are taste testing and encouraging actionable ideas. Opportunities exist to develop partnerships or sponsorships so that produce sampling and other health interests can be expanded.

The Overwaitea Food Group has 6 concept stores in B.C. in which there is an increased emphasis on fruit and vegetables with lighting and structural changes to heighten the appeal of produce; health attribute signage of 15 produce items; and expanded sampling programs (unmanned sampling as well as demonstrations). It has a web site to include health information; laminated binders in all produce departments with information on how to select, store, and prepare fruit and vegetables; Buy BC and/or 5 to 10 A Day Campaign materials; and cross promotion of products within the store to encourage people to purchase produce to accompany their meal (e.g. baskets of lemons in the fish department).

Thrifty Foods works one-to-one with growers in the belief that if produce is high quality and provided in season, consumers will eat more fruit and vegetables and be motivated to continue to eat more (i.e. poor quality may result in people being turned off fruit and vegetables). It conducts supermarket tours for adults and school groups. An important component of the tours is to create a connection between consumer and grower as well as to inform consumers of healthy choices.

Each Thrifty store has a culinary chef that creates samples based on monthly themes. The company considers the celebration of food important in the context of aroma, texture, colour and total eating experience. Specific fruit and vegetable are featured on a rotating basis. This includes tasting, selection, and preparation tips. Each staff member has the authority to wash, cut and provide a sample of any fruit or vegetable upon customer request.

5. Gap Analysis

This section summarizes the current situation and identifies the gaps in policies, communication strategies, programs, research, and infrastructure support in British Columbia.

Status	Policies	Communications	Programs	Research	Infrastructure Support
Current	Agri-food policy (in development) Health Goals for B.C. School Meal Program Regional Food Policy Councils	5 – 10 A Day: Are You Getting Enough? Campaign Buy BC Program Community Nutritionists- newspaper columns, radio and TV spots Farm Folk/City Folk – media interviews	B.C. Agriculture in the Classroom Modules B.C. Dairy Foundation Teacher/School Resources Cooking for Your Life – Canadian Diabetes Association Community Gardens/Training Centres/Garden Classes Community Kitchens Community Supported Agriculture Farmers' Markets Food Banks Fruit Tree Projects Good Food Boxes Heart Smart Cookbooks Heart Check Program (supermarket) Heart Smart Restaurant Program Heart Smart Kids Program Heart Smart Family Pack HomeGrown Project Neighbourgardens Presentations – Community Nutritionists Middle/Secondary School Program – Capital Health Region Supermarket Tours	None is taking place in B.C. Best practices defined in the literature for: Elementary School Children Low- income Women Worksite Policy	Provincial Partnerships: Community Institute for Sustainable Agriculture B.C. Produce Marketing Association Regional partnerships: Primarily around food security issues/programs

Status	Policies	Communications	Programs	Research	Infrastructure Support
Gaps	<p>Need for provincial health goals to include indicators for fruit and vegetable consumption.</p> <p>Need for provincial and municipal food policies.</p> <p>Need for provincial agri-food policy to support increased fruit and vegetable consumption.</p> <p>Need for provincial health plan to include a fruit and vegetable strategy.</p> <p>Need to develop standards and guidelines regarding the incorporation of fruit and vegetables into food programs and food service in government funded programs and institutions.</p>	<p>Need for Health Canada and Provincial Government to participate in the 5 to 10 a day Campaign.</p>	<p>Need for coordinated multi-pronged fruit and vegetable strategy.</p> <p>Need to enhance existing and develop new community-based initiatives.</p> <p>Need to support community-based initiatives through specifically targeted funds and streamlined funding processes.</p> <p>Need to develop tools and training to support policy interventions.</p>	<p>Need to determine motivation, barriers and best practices for:</p> <p>Youth</p> <p>Seniors</p> <p>Disabled</p> <p>Need mechanisms for enabling best practices i.e. adequate research funding, dissemination of information, access to expert partners.</p>	<p>Need to establish multi-sectorial partnerships in fruit and vegetable promotion.</p> <p>Need to develop consensus on objectives and approach to coordinated provincial fruit and vegetable strategy.</p> <p>Need for cross government endorsement and involvement in implementation of a provincial fruit and vegetable strategy.</p>

6. Recommendations

Opportunities exist to improve the health of the population, to increase economic benefits to the agri-food industry, and to enhance existing partnerships and programs by promoting increased fruit and vegetable consumption for British Columbians.

The literature indicates that successful interventions have long-term multi-pronged approaches; have participatory models with broad representation; and have adequate training, support and resources.

Adequate resources need to be allocated to support a long-term multi-faceted fruit and vegetable strategy that includes: policy interventions, awareness interventions, program interventions, research interventions, and infrastructure support.

Policy Interventions

- 1) Establish a B.C. Fruit and Vegetable Action Plan as a long-term multi-faceted strategy to support Provincial Health Goal #6 – reduction of preventable illness, injuries, disabilities and premature deaths.

Epidemiological and clinical evidence indicates that increasing intakes of fruit and vegetables decreases the risk of major chronic diseases such as cancer, coronary heart disease, stroke, hypertension, type 2 diabetes, chronic pulmonary disease, cataracts and macular degeneration. Although the mechanisms for the protective effects are not fully understood, the strong association between consumption of a variety of *whole* fruit and vegetables and reduction in chronic disease merits immediate provincial action. Other jurisdictions are consistent in their recommendation of 5 to 10 servings of fruit and vegetables per day; many have developed policy and programs to support increased fruit and vegetable consumption.

- 2) Revise the Health Goals for B.C. to include the *percentage of the population consuming 5 to 10 servings of fruit and vegetables per day* as an indicator for:
 - Goal 2, Objective 4 – “Improve and maintain individual capacity and supports for making lifestyles choices to enhance personal well-being and reduce health risks by increasing the percentage of British Columbians who have a healthy diet.”
 - Goal 6 – reduction of preventable illness, injuries, disabilities and premature deaths – in the objectives related to the reduction of chronic disease.

The B.C. Nutrition Survey will provide baseline information for this indicator.

- 3) Establish a provincial food and nutrition policy to ensure that all people at all times have equitable and dignified access to sufficient, safe, health and culturally appropriate foods including 5 to 10 servings of fruit and vegetables per day.

This policy is required to support all government agencies in decision-making, developing program policies, and ensuring the health of British Columbians.

- 4) Review the proposed provincial agri-food policy to ensure it supports increased fruit and vegetable consumption.
- 5) Develop standards and guidelines to increase accessibility and consumption of fruit and vegetables in all government funded programs and institutions involved in food service and provision.

Example:

Provide increased selection of and reduced cost of fruit and vegetable items as well as point-of-purchase promotional information in food services and vending machines of hospitals, educational institutions, and government worksites.

Awareness/Communication Interventions

- 6) Maximize impact of 5 to 10 A Day: Are You Getting Enough? Campaign by coordinating national and provincial efforts.

The 5 to 10 A Day: Are You Getting Enough? Campaign – a social marketing initiative targeted to women aged 25-45 years – is being implemented at a national level through the collaborative efforts of the Canadian Produce Marketing Association, Canadian Cancer Society, and Heart and Stroke Foundation. The campaign consists of public awareness events and public service announcements as well as promotional and educational resources. Campaign partners hope that provincial governments will enhance this initiative but no formal plans have been made.

- 7) Advocate for Health Canada to become a contributing partner to expand the national 5 to 10 A Day: Are You Getting Enough? Campaign.

The national 5 to 10 A Day: Are You Getting Enough? Campaign is relying on public service announcements. Government support of this initiative should include budgets for paid advertising. The literature review indicates that effective social marketing campaigns include paid advertising as part of their strategy. Paid advertising ensures that the messages reach the appropriate target audience in a manner that is timely and acceptable.

Program Interventions

- 8) Support community-based initiatives for fruit and vegetable promotion through specifically targeted funds and streamlined funding mechanisms.

Lack of funding and tedious mechanisms for funding applications have been identified as barriers to community program development. The funding process used by Van-City Credit Union for its community grants has been cited as a potential model.

- 9) Develop tools and training to support best practices in food service establishments and to support implementation of policy related to increasing accessibility of fruit and vegetables in government funded food programs and food services.

Research Interventions

- 10) Conduct research to determine the motivation and barriers to fruit and vegetable consumption as well as best practices for fruit and vegetable promotion for: youth, seniors, and disabled.
- 11) Establish mechanisms to support best practices including dissemination of best practices, access to expert partners in intervention development, and adequate funding of research interventions.

Infrastructure Support

- 12) Establish multi-sectorial partnerships in fruit and vegetable promotion.

There are some partnerships established within certain sectors. However, partnerships need to be expanded to include all relevant sectors working collaboratively on fruit and vegetable promotion.

- 13) Facilitate stakeholder consensus on the objectives and approach to fruit and vegetable promotion.

Although there is support for a coordinated, integrated approach to fruit and vegetable promotion, there are varying opinions as to how this might be accomplished and what roles each of the stakeholders might play.

- 14) Mobilize cross government endorsement and involvement in fruit and vegetable promotion.

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Appendix A: Provincial Snapshot - Contacts

- Donna Anaka, Manager Promotions, Buy B.C., B.C. Ministry of Agriculture, Food and Fisheries. E-mail: donna.anaka@gems8.gov.bc.ca Web site: www.buybc.gov.bc.ca
- Donna Antonishak, Donna Community Nutritionist, North Okanagan Health Region – Vernon. E-mail: dantonishak@nohr.org
- Catherine Atchison, Community Nutritionist, Fraser Valley Health Region – Chilliwack. E-mail: Catherine.Atchison@fvhr.org
- Lindsay Babineau, B.C. Agriculture in the Classroom E-mail: Lindsay.Babineau@gems9.gov.bc.ca Web site: www.aitc.ca/bc
- Herb Barbolet, Executive Director, Farm Folk/City Folk Society. E-mail: office@ffcf.bc.ca Web site: www.ffcf.bc.ca
- Michele Blanchet, Community Education Coordinator, Canadian Diabetes Association – B.C. Division. E-mail: michele.blanchet@diabetes.ca Web site: www.diabetes.ca
- Rae Blewden, Coordinator, Neighborgardens Society. E-mail: neighbourgarden@hotmail.com Web site: www.cityfarmer.org/Neighborgardens.html
- Margaret Broughton, Community Nutritionist, North Shore Health Region – North Vancouver. E-mail: mbrought@nshr.hnet.bc.ca
- Jessica Chenney, Interim Project Coordinator, Vancouver Community Kitchen Project. E-mail: cooking@uniserve.com Web site: www.communitykitchens.ca
- Patricia Chuey, Lifestyle Coordinator, Overwaitea Food Group. Web site: www.overwaitea.com
- Jennifer Coulson, Coordinator, Vancouver Food Policy Organization. E-mail: vfpo@vcn.bc.ca Web site: www.vcn.bc.ca/vfpo
- Arlene Cristall, Community Nutritionist, Simon Fraser Health Region – Maple Ridge. E-mail: arlene_crystal@sfhr.hnet.bc.ca
- Tova Dancevic, Community Nutritionist, Peace Liard Community Health Services – Fort Nelson. E-mail: tova.dancevic@gems7.gov.bc.ca
- Murray Driediger, General Manager, British Columbia Vegetable Marketing Commission. Web site: www.bcveg.com/commission
- Corinne Eisler, Community Nutritionist, Vancouver/Richmond Health Board – Pacific Spirit Community Health Centre. E-mail: corinne_eisler@vrhb.bc.ca

Joyce Fitz-Gibbon, Program Coordinator, B.C. Housing People, Plants and Homes Program, B.C. Ministry of Economics and Social Development
Web site: www.bchousing.org

Rick Gilmore, Lower Mainland Produce Distributors

Beverly Grice, Community Nutritionist, Vancouver/Richmond Health Board – Raven Song Community Health Centre. E-mail: beverley_grice@vrhb.bc.ca

Joanne Houghton, Community Nutritionist, Cariboo Health – Quesnel.
E-mail: joanne.houghton@cchs.hnet.bc.ca

Vivianne Johnson, Community Nutritionist, Central Vancouver Island Health Region – Nanaimo. E-mail: viviane.johnson@cvih.bc.ca

Cindy Jorgensen, Community Nutritionist, East Kootenay Health Services Society – Cranbrook. E-mail: cindy.jorgensen@ekchss.hnet.bc.ca

Devorah Kahn, Your Local Farmers' Market Society. E-mail: eatlocal@sfu.ca

Laura Kalina, Community Nutritionist, Thompson Regional Health Board, Kamloops; ShopSmart Tours. Email: shopsmart@telus.net

Pam Kheong, Community Nutritionist, South Fraser Health Region – Delta.
E-mail: pamela.kheong@sfvhr.hnet.bc.ca

Michael Levenston, Executive Director, City Farmer. E-mail: cityfarm@interchange.ubc.ca
Web site: www.cityfarmer.org

LifeCycles Project Society. Web site: www.lifecyclesproject.ca Email: lifecycles@coastnet.com

Diego Marchese, Health Promotion Manager, Heart and Stroke Foundation of B.C.. Web site: www.heartandstroke.bc.ca

Sydney Massey, Nutrition Educator, B.C. Dairy Foundation. Web site: www.bcdf.org
E-mail: smassey@bcdf.org

Dania Matiation, Community Nutritionist, Coast Garibaldi Community Health Services Society – Sechelt. E-mail: daniamatiation@cgh.bc.ca

Michael Mochler, Thrifty Foods
Web site: www.thriftyfoods.com

Leanne Murakami-Lee, Prevention Coordinator, Canadian Cancer Society – B.C. & Yukon Division. Web site: www.cancer.ca

Sherry Ogasawara, Community Nutritionist, Northern Interior Health Board – Prince George. E-mail: sogasawara@pghosp.hnet.bc.ca

Michael Pitt, Professor, University of British Columbia, Faculty of Agricultural Sciences
E-mail: mpitt@interchange.ubc.ca

Barbara Price, Community Nutritionist, South Fraser Health Region – Langley.
E-mail: B.C.price@bcsc02.gov.bc.ca

Shefali Raja, Community Nutritionist, Vancouver/Richmond Health Board - Evergreen
Community Health Centre. E-mail: shefali_raja@vrhb.bc.ca

Eva Riccius, B.C. Fruit Tree Project. E-mail: fruit@vcn.bc.ca Web site:
www.vcn.bc.ca/fruit

Anita Romaniw, Community Nutritionist, Fraser Valley Health Region – Abbotsford.
E-mail: anita.romaniw@fvhr.org

Karin Schreurs, Coordinator, Good Food Box Program – Vancouver.
E-mail: scheurs@portal.ca

Flo Sheppard, Community Nutritionist, North West Community Health Services Society –
Terrace. E-mail: flo.sheppard@nwch.hnet.bc.ca

Margie Shurko, Secretary-Treasurer, British Columbia Produce Marketing Association.
E-mail: info@bcpma.ca

Tracy Smyth, Community Nutritionist, Central Vancouver Island Health Region – Port
Alberni. E-mail: tracy.smyth@cvihr.bc.ca

Anne Swann, Community Nutritionist, Vancouver/Richmond Health Board – North
Community Health Office. E-mail: anne_swann@vrhb.bc.ca

Judy Toews, Community Nutritionist, Kootenay Boundary Health Services Society –
Nelson. E-mail: judy.toews@k.B.C.hss.hnet.bc.ca

Lorie Way, Community Nutritionist, Saanich Health Unit, Capital Health Region.
E-mail: lorie.way@caphealth.org

Harry Weins, Fraser Valley Strawberry Growers Association; Cole Crop Growers
Association; B.C. Potato Association